000

344001

MICROFILMED
OPEN FILE

D of M | A.O. | C.G. | E.O. | D.S.I.
D. DIR. | 25 SEP 1984 | Registrar | E & IL
DEPT. OF MINES
REF. No. 9835/84

BILLITON AUSTRALIA

One of the Shell Group of Companies in Australia

E.L. 8/77 - RIANA

RELINQUISHMENT REPORT

Author : P.A. Ruxton

Date : 21/9/84

Report No : 08.2490

Copy No : 1

Distribution :
1. Mines Department
2. Comalco Ltd.
3. BXHE/AHO
4. BXH/Devonport

AMG REFERENCE POINTS ADDED

001

CONTENTS

SUMMARY

1.0 INTRODUCTION

- 1.1 General
- 1.2 Topography & Access
- 1.3 Exploration Philosophy
- 1.4 Previous Investigations
- 1.5 Exploration - Comalco 5/8/77 - 1/1/80 (Summary)
- 1.6 Exploration - Shell/Comalco 1/1/80 - 5/8/84 (Summary)

2.0 REGIONAL GEOLOGY

3.0 AIRBORNE SURVEYS

- 3.1 Aeromagnetic Survey
- 3.2 INPUT Survey
- 3.3 Anomaly Followup
  - 3.3.1 Southern Licence Area
  - 3.3.2 Central Licence Area
  - 3.3.3 Northern Licence Area

4.0 GRAVITY SURVEY

5.0 STREAM SEDIMENT SURVEY

6.0 CONCLUSIONS

REFERENCES

APPENDICES

002

LIST OF FIGURES

FIGURE	1 :	RIANA E.L. 8/77 - Location Plan - Relinquished & Retained Ground.	1:250 000
FIGURE	2 :	RIANA E.L. 8/77 - Geology of Relinquished Area	1:250 000
FIGURE	3 :	RIANA E.L. 8/77 - INPUT Survey Anomalies - Relinquished Area	1:250 000
FIGURE	4 :	RIANA E.L. 8/77 - Aeromagnetic Map of the Southeast Margin of the Housetop Granite	1:20 000

LIST OF TABLES

TABLE	1 :	RIANA E.L. 8/77 - Relinquished Portion - Aeromagnetic Anomaly List
TABLE	2 :	RIANA E.L. 8/77 - Relinquished Portion - INPUT Anomaly List

LIST OF PLANS

Plan No.	Title	Scale
D/MQ 04/104R	RIANA E.L. 8/77 & HAYES PEAK E.L. 14/80 Geology - Relinquished Ground	1:50 000
D/MQ 04/174R	RIANA E.L. 8/77 & HAYES PEAK E.L. 14/80 Grid Location Map - Relinquished Ground	1:50 000
D/MQ 04/080R	RIANA E.L. 8/77 Airborne Magnetic Survey with Anomaly Numbers - Relinquished Ground	1:63 360
D/MQ 04/164R	RIANA E.L. 8/77 & HAYES PEAK E.L. 14/80 Anomaly Map - Relinquished Ground	1:50 000
D/MQ 04/082	RIANA E.L. 8/77 Reconnaissance Ground Magnetics Midgley Falls (4144/3)	1:2 500
D/MQ 04/077	RIANA E.L. 8/77 Reconnaissance Ground Magnetics Stotts Road (4143/3)	1:2 500
D/MQ 04/139	RIANA E.L. 8/77 Initial Ground Check INPUT Anomaly IR 1 Knob Park	1:2 500

APPENDIX 1

D/MQ 04/053	RIANA E.L. 8/77 Redwater Prospect. Geology & Drillhole Locations	1:2 500
D/MQ 04/014	RIANA E.L. 8/77 Redwater Grid. Peak Hill Farm Section. Stacked Magnetic Profiles	1:2 500
D/MQ 04/036	RIANA E.L. 8/77 Redwater Prospect. Schematic Geological Cross-Sections along Line 6100N	1:1 000
D/MQ 04/035A	RIANA E.L. 8/77 Redwater Prospect. Line 6100N. Holes RED 3, RD 4 & 5. Geology.	1:500
D/MQ 04/035B	RIANA E.L. 8/77 Redwater Prospect. Line 6100N. Holes RED 3, RD 4 & 5 Geochemical Assays Sn, W	1:500
D/MQ 04/049	RIANA E.L. 8/77 Laurel Creek West. Soil Geochemistry Cu, Pb, Zn	1:2 500
D/MQ 04/050	RIANA E.L. 8/77 Laurel Creek West. Soil Geochemistry Sn, W	1:2 500
D/MQ 04/051	RIANA E.L. 8/77 Laurel Creek West. Soil Geochemistry Ni, Fe	1:2 500
D/MQ 04/043	RIANA E.L. 8/77 Laurel Creek West. Total Field Magnetic Contours	1:2 500

Plans Cont.

APPENDIX 2

Plan No.	Title	Scale
D/MQ 04/045	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Soil Geochemistry Ni, Fe	1:2 500
D/MQ 04/046	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Soil Geochemistry Sn, W	1:2 500
D/MQ 04/047	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Soil geochemistry Cu, Pb, Zn	1:2 500
D/MQ 04/054	RIANA E.L. 8/77 Loyetea Prospect Western Portion Soil Geochemistry Sn, W	1:2 500
D/MQ 04/055	RIANA E.L. 8/77 Loyetea Prospect Western Portion Soil Geochemistry Cu, Pb, Zn	1:2 500
D/MQ 04/056	RIANA E.L. 8/77 Loyetea Prospect Western Portion Soil Geochemistry Ni, Fe	1:2 500
D/MQ 04/037	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Ground Magnetic Values	1:2 500
D/MQ 04/039	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Stacked Magnetic Profiles	1:2 500
D/MQ 04/042	RIANA E.L. 8/77 Loyetea Prospect Western Portion Ground Magnetics	1:2 500
D/MQ 04/048	RIANA E.L. 8/77 Loyetea Prospect Western Portion Magnetic Profiles	1:2 500
D/MQ 04/070	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Stacked Magnetic Profiles 2900E, 3000E & 3100E	1:2 500
D/MQ 04/071	RIANA E.L. 8/77 Loyetea Prospect Western Portion Stacked Magnetic Profiles 1500E, 1600E & 1700E	1:2 500

APPENDIX 3

D/MQ 04/072	RIANA E.L. 8/77 Redwater North Prospect. Ground Magnetic Profiles	1:2 500

005

LIST OF APPENDICES

APPENDIX 1 : Southern Licence Area - Redwater-Loyetea Trend - Redwater and Laurel Creek prospect.

APPENDIX 2 : Southern Licence Area - Redwater-Loyetea Trend - Loyetea Prospect

APPENDIX 3 : Southern Licence Area - Redwater-Loyetea Trend - Redwater North and Peak Hill Farm Prospect.

APPENDIX 4 : Southern Licence Area - Housetop and Castra Aeromagnetic Anomalies (4042/2 & 4142/4 respectively).

APPENDIX 5 : Magnetic Remanence Measurements on Tertiary Basalt.

APPENDIX 6 : Central Licence Area - Aeromagnetic & INPUT Anomalies

- Midgley Falls (4144/3 + IR 11)
- Camena (4111/2)
- Wattle Grove (4143/2)
- Stotts Road (4143/3)
- South Riana (4143/4)
- Knob Park (4144/IR 1)
- IR 5

APPENDIX 7 : Redwater Granite Stream Sediment Anomaly

006

SUMMARY

The Riana Licence E.L. 8/77 was reduced from 316 sq km to 170 sq km on 5/8/84. This report summarizes exploration by Shell (Billiton Aust.) and Comalco between 1/1/80 to 5/8/84 in the relinquished portion of E.L. 8/77.

Exploration in the relinquished portion of E.L. 8/77 has focused on followup of three major surveys; a) aeromagnetics, b) INPUT, and c) a stream sediment survey completed by Comalco prior to 1/1/80.

Diamond drilling on magnetic high features in the Redwater area (SE margin of the Housetop Granite) has defined narrow magnetite skarns forming as skins at the granite/Gordon Limestone contact. Maximum geochemical values of 760 ppm WO_3 and 430 ppm Sn were downgraded.

Remaining anomalous magnetic features have been attributed to magnetite-bearing Cambrian Volcanics and highly remanently magnetized Tertiary basalt.

Four INPUT anomalies have been related to conductive units in the Tertiary basalt cover.

Two anomalous stream sediment areas were explained - the Redwater Granite anomaly (Sn/WO_3) associated with minor greisenization of the SE margin of the Housetop Granite - and the Penguin Anomaly (WO_3) related to drainage from rocks outside the relinquished ground.

A regional gravity survey was conducted leading to the identification of a possible granite cupola on the eastern margin of the relinquished ground. The coincidence of this feature with the Midgley Falls combined aeromagnetic and INPUT anomaly and the Knob Park INPUT anomaly was an upgrading factor.

No economic mineralization was located in the relinquished ground. The area has been well prospected and is recommended for relinquishment.

1.0 INTRODUCTION

1.1 General

The Riana Exploration licence (E.L. 8/77) was initially granted to Comalco Limited on 5/8/77. The Shell Company of Australia (Billiton Australia) became the operating partner of a Joint Venture with the Commonwealth Aluminium Corporation Limited (Comalco wholly owned subsiduary) in January 1980.

The Riana Licence covers an area of 316 sq km and being in excess of 5 years old was due for relinquishment on 5/8/84. Two blocks of the original licence will be retained totalling 170 sq km (Fig. 1) with a further reduction to 125 sq km due on 5/8/85.

This report summarizes exploration by Shell and Comalco between 1/1/80 to 5/8/84 in the relinquished portion of E.L. 8/77. Work by Comalco between 5/8/77 and 1/1/80 is outlined in Weste (1979) - on Open File in 1984.

1.2 Topography & Access

E.L. 8/77 Riana consists of undulating basalt hills, dissected by north flowing rivers confined to deep valleys and gorges. Most of the area (particularly the Tertiary basalt) is cleared to semicleared private land. Those areas which are covered by bush are serviced by many 4WD tracks. Loyetea Peak (Ordovician conglomerate) is the highest peak at 700 metres above sea level. Basal Ordovician rocks form ridges elsewhere in the licence, but they do not project much above the high basalt plateau of 400 metres above sea level. Sealed roads are numerous and access is easily gained from Burnie and Devonport. (Location map - Fig. 1).

1.3 Exploration Philosophy

The relinquished area was considered prospective for carbonate-hosted skarn deposits and basemetal Au/Ag ores related to Cambrian Volcanics.

Gordon Limestone units adjacent to the Housetop Granite were outlined as target areas for a) Kara-type scheelite/magnetite skarn, b) Moina-type calc-silicate/fluorite/cassiterite skarn, and c) Mt. Bischoff-type pyrrhotite/cassiterite replacement skarn. Aeromagnetic and INPUT techniques were used to try and define skarn bodies beneath Tertiary Basalt cover.

Stream sediment sampling by Comalco attempted to define skarn bodies with examination of magnetic and heavy mineral concentrates. Base metal mineralization was sought by assaying stream sediment for Cu, Pb and Zn.

1.4 Previous Investigations

Twelvetrees (1903, 1909) made mention of the mining fields of north western Tasmania, especially the Dial Ranges and Gunns Plains districts.

Mining and exploration of silver-lead mineralization on the coast in the Penguin area has been carried out since 1867. Mining activity ceased in about 1910. Since then the area has been little explored except for ground magnetic, radiometric and induced polarization geophysical surveys by BHP (Hewitt, 1968).

Hematite and limonite deposits in the Penguin Creek area have been intermittently explored and mined since 1884 (Atkinson, 1958, Burns, 1961, Jennings, 1968, Longman, 1962A, Smith, 1960).

In the 1950s and 1960s the Licence received some attention in the search for iron ores. The BMR carried out an airborne magnetic survey (Goodeve, 1955) and the Highclere Iron deposit was investigated by ground magnetics and drilling by the Mines Department (Jack, 1965). Core was analysed for Fe, Si, Al, Ti, Mn, P, S, V but not for Sn, W or F.

A statewide BMR gravity survey conducted in the late 1960's (?) covers part of the area. BMR airborne scintillometer traversing did not cover the licence area.

As part of a B.Sc. honours project, Sheehan (1969) carried out a gravity survey in northern Tasmania, and included the eastern part of the Housetop Granite in this survey.

In 1972 Conzinc Rio Tinto of Australia Exploration (CRAE) carried out ground scintillometer work over the Housetop Granite, chiefly in the areas just east of E.L. 4/77, but did not detect any significant mineralization (Porter, 1972).

From 1972 to 1974 Australia and New Zealand Exploration Co. (ANZECO) carried out exploration in the area over E.L. 1/69 held by Tasminex N.L. (Brandt, 1973,1974). The work done was chiefly examination of stream sediment panned concentrates for the presence of scheelite. Tasminex drilled two short diamond drill holes at the Redwater Prospect.

1.5 Exploration - Comalco 5/8/77 to 1/1/80 (Summary)

Exploration by Comalco was dominated by a stream sediment sampling programme which covered the entire Riana licence omitting areas of granite outcrop. Several anomalies were located but few were resampled and checked. Reconnaissance was carried out over areas of known mineralization e.g. Redwater, Penguin and Neptune mines. Tasmanian Iron Mines, Copper King, Blythe Iron and Natone Iron. Detailed followup was undertaken on the Redwater prospect involving gridding,

ground magnetics, IP and finally drilling. Three diamond holes were drilled intersecting magnetic skarn, wrigglite and garnet-biotite-actinolite skarn with maximum values of 760ppm WO_3 and 430ppm Sn. The skarn bodies form a narrow skin at the Gordon Limestone/Housetop granite contact.

Details of Comalco exploration are outlined in Weste, (1979).

1.6 Exploration - Shell/Comalco 1/1/80 to 5/8/84 (Summary)

Shell flew an aeromagnetic survey over the entire licence in early 1980 to try and locate magnetic skarn deposits. Numerous anomalies were defined and ranked on geophysical and geological grounds for followup.

Initial groundwork was concentrated in the Redwater/Loyetea area with a further two diamond holes drilled at Redwater and one percussion hole centred on an adjacent magnetic feature. Additional skarn bodies were located but with disappointing geochemical results.

An INPUT Survey was flown in the northern portion of E.L. 8/77 with part coverage of the relinquished ground (Fig. 3). The aim was to detect coencident magnetic and conductive anomalies with a Mt. Bischoff/Renison pyrrhotite skarn target in mind. One combined aeromagnetic and INPUT feature was defined at Midgley Falls but followup yielded a basalt-related source. Several other basalt-related aeromagnetic anomalies were ground checked.

Mineralization in the Penguin area was ground checked.

The Comalco stream sediment data was reevaluated. Anomalous tin values were noted north of Redwater in streams draining Housetop Granite. This prospect (Redwater Granite Prospect) was mapped and resampled with negative results.

2.0 REGIONAL GEOLOGY

E.L. 8/77, Riana is partially covered by three one mile Geology sheets, viz., Sheffield (Jennings, 1959), Devonport (Burns, 1963) and Burnie (Gee, 1967). A fourth one mile sheet covering the rest of the licence, St. Valentines, is in preparation. Discussion of the regional geology of the licence has been adequately covered by many authors including Twelvetrees (1903, 1909); Burns (1964); Jennings (1959,1979); Gee (1977) and Williams and Turner (1974) (Regional Geology Fig. 2, Plan D/M204/104R).

The oldest rocks in the E.L. are the Proterozioc Ulverstone Metamorphics which form part of the Forth Nucleus (Williams and Turner, 1974) and consist of quartzite, schist and conglomerate. These rocks outcrop along the coast in the Forth Nucleus outcrop of sandstones and mudstones of the Rocky Cape Group occur. These are unconformably overlain by a north-south trending belt of Cambrian sediments and acid to basic volcanics deposited in the Dial Range Trough (Burns, 1964). Iron, copper and cobalt mineralization are associated with Basic Cambrian volcanics in the Penguin area.

To the west of the Dial Range the oldest rocks belong to the Precambrian Burnie Formation, a sequence of turbidite sandstones, siltstones and shales inpart containing intrusive basic igneous rocks (Gee, 1977). These rocks are folded and deformed by at least two phase of deformation with NE trending folds dominant.

The Burnie Formation is unconformably overlain by silicified and ferruginized sandstones and siltstones, dolomites and ironstones of the Cambrian/Precambrian Oonah Formation. Ordovician conglomerates, sandstones and limestones overly the Precambrian /Cambrian stratigraphy, outcropping in the southern part of the relinquished portion of the area near Gunns Plains and are inferred as subcrop beneath Tertiary basalt cover in the Camena/ Midgley Falls areas north of Riana.

Sediments of Silurian age occur in the axis of the Gunns Plains synform.

This succession is passively intruded by the Devonian Housetop granite generally a medium to coarse grained pink adamellite. Porphoritic and fine grained contact variants have been identified in the Redwater area. The Housetop granite contains Sn-bearing greisen veins at Crane's Tin prospect to the west of the Riana licence (Fig. 2) and is associated with the magnetite/scheelite skarns of Kara. Geophysical (gravity) data suggests that the granite is laccolith shaped with a feeder zone located along the SE margin (Sheehan, 1969; Oakes, 1983).

Uplift and erosion during Tertiary times removed the roof portions of the Housetop Granite. Pockets of uneconomic tin-bearing alluvium are preserved beneath basalt cover. Tertiary basalt flows filled Tertiary topography effectively resulting in highly irregular basalt thickness.

3.0 AIRBORNE SURVEYS

3.1 Aeromagnetic Survey

In March 1980 Shell commissioned Geometrics to fly an airborne magnetic and radiometric survey of approximately 6800 line kilometres over E.L. 8/77 and adjacent licences. The survey was designed to locate Moina, Kara and Bischoff style magnetic responses and to aid in geological mapping. Equipment was helicopter borne flown at a mean terrain clearance of 70m on a 250m line spacing. Data was recorded digitally. Contour maps and data tapes have been submitted to the Mines Department.

A large number of anomalies were selected on geophysical and geological grounds. All airborne data was monitored, modelled and evaluated by Dr. Geoff Dickson a contract geophysicist.
Three groups of anomaly were initially defined:
Group 1 a belt of coencident magnetic and radiometric anomalies on the SE margin of the Housetop granite - the Redwater-Loyetea trend,
Group 2 anomalies associated with Cambrian volcanics and ironstones concerning the Penguin area of the relinquished ground and
Group 3 anomalies associated with basaltic features.
Examples of anomalies from each group are listed below and plotted on Plans D/MQ04/080 R and D/MQ04/164 R. Details of anomaly follow-up and explanations are listed in Table 1.

GROUP 1 Redwater - Loyetea Trend (Fig. 4)

a) Skarn Bodies - Redwater (4142/1)
Source Extensions of Redwater (4142/13)
Laurel Creek West (4042/1) (4042/11)

b) Cambrian Volcanics - Loyetea West (4142/11)
Source (4142/10) & (4142/15)

c) Tertiary Basalt - Redwater North (4142/9)
Source Peak Hill Farm (4142/12)
Lowana Creek (4142/3)
Loyetea East (4142/2)

GROUP 2 Penguin Area

a) Cambrian Volcanics - Neptune (4244/2)
Source Penguin (4244/1)

b) Tertiary Basalt - Dial Point (4244/3)
Source

GROUP 3 Basalt Related

Midgley Falls (4144/3)
Wattle Grove (4143/2)
Stotts Road (4143/3)
Camena (4144/2)
Castra (4142/4)
etc.

3.2 Input Survey

An INPUT Survey was flown over the northern portion of the Housetop Granite/country rock contact in January 1982. A fixed wing Catellena aircraft flew the survey contracted to Geoterrex. A total of 248 line kilometres were flown on the Riana Block with a line spacing of 300m and mean terrain clearance of 120m. Four anomalies were located in the relinquished portion of E.L. 8/77 (Table 2). IR1 (Knob Park) was defined as a broad anomalous zone with a major near surface conductive component and IR5 a narrow isolated feature with a cultural source. Both anomalies were rated low priority followup. A further two anomalies IR10 and IR11 were selected during reinterpretation of the data. IR11 is coecident with the Midgley Falls aeromagnetic anomaly. IR10 and 11 are located in a conductive zone of basalt hash (location Plan D/MQ04/164 R).

3.3 Anomaly Followup

3.3.1 Southern Licence Area

a) Redwater-Loyetea Aeromagnetic/Radiometric Trend

The airborne magnetic and radiometric survey highlighted a broad NE trending zone of numerous anomalies on the SE margin of the Housetop Granite between

Redwater, Loyetea and Laurel Creek (Fig. 4). Initial groundwork by Comalco located magnetite-bearing skarn bodies at the margin of the granite using soil sampling, ground magnetics, IP and drilling (West, 1979). The aeromagnetic survey indicated a much broader zone than was initially envisaged. Anomalies within this zone have been attributed to magnetite skarns, magnetic cambrian volcanics and tertiary basalt.

1) Skarn Bodies

Three diamond holes were drilled at Redwater by Comalco and a further two by Shell on magnetic targets (Drilllogs and magnetic susceptibilities - Appendix 1). A further magnetic anomaly Laurel Creek West (4042/1) (Fig.4) was investigated and drilled by Shell. Four intersections of magnetite, wrigglite and minor garnet-biotite-actinolite skarn were made but all with low order geochemistry.

Drill hole	Intersection of Magnetite Skarn	Max. Sn ppm	W ppm
DDH RED 1	58.72 - 60.70 (1.98m)	130	10
	77.25 - 78.00 (0.75m)	70	30
DDH RED 2	26.05 - 40.5 (14m)	430	760
DDH RED 3	No magnetic skarn	-	-
DDH RD 4	No magnetic skarn	-	-
DDH RD 5	167.80 - 168.20 (0.40m)	320	25
	162.96 - 164.03 (1.07m)	450	50
PDH LCW 1	48 - 58 (10m)	310	25

(Holes RED 1, 2, 3 were drilled by Comalco, refer Weste, 1979, Holes RD 4, RD 5 and LCW 1 were drilled by Shell).

Skarn bodies are narrow forming a thin skin at the granite/Gordon limestone contact with low tonnage potential and low order geochemistry. Details of followup are reported in Appendix 1

with accompanied figures and plans.

2) Cambrian Volcanics

Several anomalies in the Redwater-Loyetea trend have been attibuted to magnetic Cambrian volcanics. The Loyetea prospect - Loyetea West 4142/11 - is an example of this (Table 1 - Appendix 2 for details). Magnetite-bearing Cambrian volcanics with magnetic susceptibilities of between 2,000 and 15,000 x 10^{-6} cgs units give rize to a 3000 to 4000 g ground magnetic anomaly on the western part of the grid adjacent to the granite contact. Patchy, low order Cu, Pb and Zn anomalies in soils were evident over volcanic rocks (maximum values of 175ppm Cu, 220ppm Pb, 230ppm Zn: Plan D/MQ04/055). A magnetic feature on the eastern section of the grid is related to tertiary basalt (Loyetea East, 4142/2).

3) Tertiary Basalt

A number of anomalies in this trend have been related to basalt sources. These are typified by basalt cover and very spikey ground magnetic traces. Magnetic susceptibilities of the basalt are low but extremely high remanence measurements have been made elsewhere (eg. Midgley Falls - Appendix 5 - values of upto 23 Q). This anomalously high remanence is considered the cause of the Midgley Falls and Castra anomalies and is infered here. Basalt related features in the Redwater-Loyetea trend include Loyetea East (4142/2) (Appendix 1), Redwater North (4142/9) (Appendix 3), Peak Hill Farm (4142/12) (Appendix 3) and the LOwana Creek (4142/3) features (D/MQ04/164R).

b) Housetop Anomaly (4042/2)

The Housetop Anomaly has an amplitude of 3000g and is located over Housetop Granite NW of Redwater (D/MQ04/164R). One reconnaissance line of ground magnetics and several rock chip samples were taken (Appendix 4). Traces of scheelite were found in a small stream draining the prospect. Assay values on rock chips give a maximum of 6ppm Sn and 115ppm WO_3. The granite in this area is unusually enriched in magnetite with magnetic susceptibilities of 10,000 x 10^{-6} cgs units and may represent a "feeder zone" for hydrothermal fluids which produced the skarns of the Redwater area.

Approximately 500m NNE of the Housetop anomaly a costean was discovered containing narrow (0.5m or less) tourmaline/quartz and tourmaline veins with assay values of upto 0.14% Sn and 25ppm WO_3. There is no tonnage potential in this area, the veins represent isolated high values and form part of the Redwater Granite stream sediment anomaly (Section 5.0).

c) Castra Anomaly (4142/4)
(alias Preston Anomaly)

The Castra anomaly is broad feature with a maximum amplitude of 400 nT. Ground magnetic data indicates a broad source with a very noisey profile (Appendix 4) and a maximum amptitude of 1200 nT. Ground inspection showed the anomaly to be entirely basalt covered with two flow units recognized with susceptibilities upto 950 x 10^{-6} cgs units and 5,100 x 10^{-6} cgs units respectively (Fig. in Appendix 4). The magnetic anomaly is related to a broad magnetic basalt flow which lies beneath a capping of less magnetic basalt forming the highest point on the hill. One sample was measured for magnetic remanence and was found to be highly

remanently magnetized (Appendix 5). Reconnaissance in the area around the Castra grid suggests a thickness of at least 200m of basalt probably underlain by Gordon Limestone or Silurian sediment.

There is considered no potential for economic mineralization related to the unaltered Gordon Limestone in this area.

3.3.2 Central Licence Area

Several aeromagnetic and INPUT anomalies in the central portion of the relinquished ground have been related to Tertiary basalt and associated sediments. The only exception is IR5 which has been attributed to cultural interference.

a) Anomalies Related of Tertiary Basalt

1) Midgley Falls (4144/3 & IR11)

The Midgley Falls anomaly is of particular interest since it lies adjacent of gravity low GL11 (Section 4.0) and has a coincident INPUT anomaly IR11. The grid is entirely basalt covered. There is a possibility of Gordon Limestone at depth since the anomalous zone occurs over an Ordovician synform. A line of reconnaissance ground magnetics gave a spikey profile (Plan D/MQ04/082). The magnetic signature is extremely high and would require a basalt susceptibility of 47,000 x 10^{-6} cgs units or a magnetic remanence of some magnitude (Koenigsberger ratio 40). Recent ground work has outlined an anomaly with two peaks (maximum value of 4,500 nT) which is coincident with a basalt hill (Appendix 6). A lineof IP was completed on 200 N from 400 W to 600 E. No anomaly was detected (Appendix 6). Three samples were measured for

magnetic remanence giving a maximum Koenigsberger ratio of 23 (Appendix 5). The lack of IP response and the high remanent magnetism of the basalt is suggestive of a basalt anomaly source. Anomaly IR 11 is surficial and considered to be due to conductive clay bands in the basalt.

2) Camena (4144/2)

The Camena aeromagnetic anomaly is a broad, high amplitude (64,000g) feature covered by alluvium of the Blythe River (Plan D/MQ04/164R). Modelling of the aeromagnetic data suggests a deep source (greater than 500m) (Appendix 6). It is interpreted as a basalt/mafic plug of Tertiary age on the grounds of morphology, high susceptibilities (upto 20,000 x 10^{-6} cgs units), deep source and radiating (stellate) basalt ridges of anomalously high magnetic response (Plan D/MQ04/080R). Wattle Grove (4143/2), Stotts Road (4143/3), Ellis Creek North (4034/2) and South Riana (4043/3) lie on these ridge structures. Refer Appendix 6.

No economic significance is attached to this feature.

3) Wattle Grove (4143/2)

The Wattle Grove anomaly was gridded (Plans D/MQo4/174R and 164R) and geologically mapped (see Appendix 6). The anomaly has a magnitude of 2,500g centred over a basalt hill adjacent to a window of unaltered medium grained equigranular biotite granite of the Housetop pluton. One assay of the granite gave low order Sn/WO_3 (Appendix 6).

4) Stotts Road (4143/3)

Early work involved a reconnaissance line of

magnetics. The results indicate an extremely spikey feature probably related to a basalt source (D/MQ04/077). Further work involved gridding, ground magnetics and mapping. (Appendix 6). The anomaly has a magnitude of 600g and is located over a basalt hill. The feature mirrors topography. Float of basalt gave magnetic susceptibilities of 600×10^{-6} cgs units. A basalt source is proposed.

5) South Riana (4143/4)

One line of ground magnetics was run over the South Riana anomaly giving a sharp peak of 2500g related to the top of a low basalt ridge. One sample of basalt was measured for magnetic remanence and was found to be remanently magnetized (Koenigsberger ratio of 6.2) (Appendix 5). A basalt source is proposed.

6) Knob Park (IR1)

IR1 is located 1-5km NNE of Midgley Falls in a similar geological setting. A reconnaissance line of V.L.F. and magnetics indicated a noisey magnetic and surficial conductive feature (Plan D/MQ04/139). A grid was placed over the anomaly. Work involved ground magnetics and one line of I.P. (Appendix 6). Geological mapping revealed total basalt cover. Again the ground magnetic results were extremely noisey and the I.P. survey located surficial conductors only. Anomalies IR10 and IR11 are also attributed to conductive layers within the basalt. All basalt covered areas traversed by the INPUT survey showed elevated conductivity levels.

7) IR 5

IR 5 is an isolated anomaly related to well earthed conductive fences.

3.3.3 Northern Licence Area

a) Cambrian Volcanic Source

The Neptune and Penguin anomalies 4244/2 and 4244/1 respectively are associated with magnetite-bearing spillitic basic lavas of the Cambrian Dial Range trough. Minor basemetals occur in this area.

b) Tertiary Basalt Source

The Dial Point anomaly 4144/3 is coencident with a Tertiary basalt hill. Magnetized basalt is pressumed the cause of this feature.

4.0 GRAVITY SURVEY

A total of 1186 gravity measurements were taken over the margins of the Housetop Granite in early 1982. The regional survey concentrated on the Northern and Western margins of the Housetop Granite. A Sodin gravity meter was operated by Shell staff with all data compiled on computer tape. The Mines Department have copies of tapes and regional maps. Survey details and results are reported in Oakes (1983). Followup of the initial survey defined one gravity low in the relinquished portion of E.L. 8/77. GL11 was defined as a 10mgal anomaly related to a granite cusp on the eastern margin of the Riana Licence (Plan D/MQ04/164R). The proximity of GL11 to the Midgley Falls (4144/3) and Knob Park (IR1) anomalies upgrades these features. With the consideration of possible Gordon Limestone within an Ordovician synform beneath cover in this area further enhances the prospectivity of these anomalies.

Modelling of the entire gravity survey data confirms work by Sheehan (1969) which suggests that the Housetop Granite has laccolith shape with a gently east dipping western contact, steep northern margin and a complex steep to gently east dipping eastern margin (Oakes, 1983).

5.0 STREAM SEDIMENT SURVEY

Stream sediment data collected by Comalco (Weste, 1979) was recompiled. The survey involved collection of a -20# size fraction, a magnetic fraction and a panned concentrate at each site. Results from the -20# fracture were used in this recompilation. Background metal values were found to be variable across different rocktypes and are summarized as:

	Cu	Pb	Zn	Sn	WO_3
Basalt	30-70	10-30	100-200	10	15
Granite	0-30	20-50	50-120	20	20

(results in ppm)

Two anomalous areas were outlined in the relinquished area (Plan D/MQ04/164R):

a) Redwater Granite (Sn/WO_3)

Anomalous stream sediment values upto 0.24% Sn and 90ppm WO_3 were recorded in a broad zone of patchy distribution on the SE margin of the Housetop Granite close to the R'iana/Hayes Peak licence boundary (Plan D/MQ04/164R). Repeat sampling and rock chip assays confirmed minor anomalous samples related to fine grained variants, pegmatitic tourmaline-bearing granite and greisenized granite (Appendix 7). Of particular interest was the Redwater Granite Prospect with Sn values of 0.24%, 680ppm and 40ppm on tributary of Bony Creek NW of Redwater. Repeat stream sampling failed to reproduce the initial results. However one rock chip sample of greisenized granite gave values of 180ppm Sn and 55ppm WO_3 (Appendix 7)

Repeat sampling was discouraging with values too spasmodic to warrant further followup in this area.

b) Penguin (WO_3)

Spot highs of upto 35ppm WO_3 occur in streams on the south of

Penguin over Cambrian volcanics (Plan D/MQ 04/164R). The values are low and believed to be draining a source rock outside the relinquished portion of the licence.

Spasmodic Cu (110ppm Max.) and Zn (290ppm Max.) highs over basalt terrain are considered to reflect minor scavenging by Fe and Mn oxides. Slightly elevated Pb values (40ppm Max.) are recorded over Gordon Limestone stratigraphy in the Gunns Plains region. Low order Sn/WO_3 anomalies are related to marginal areas of basalt cover, shedding from Tertiary sediment beneath basalt flows.

6.0 CONCLUSIONS

Exploration in the relinquished portion of E.L. 8/77 has centred on followup of airborne magnetic and INPUT surveys in the search for skarn bodies. Detailed stream sediment sampling has failed to locate basemetal or skarn deposits of interest.

Magnetite skarns on the SE margin of the Housetop Granite have been successfully located however tonnages and grades are low.

The relinquished portion of the licence has been well prospected and no economic mineralization has been located. It is recommended that the ground is dropped.

026

344027

REFERENCES

ATKINSON, W.J. (1958B). Iron deposits of the Burnie-Penguin area, the preliminary investigation of Rio Australian Exploration Pty. Ltd. Tas. Dept. Mine Open File Rep. Q28/1.

BRANDT, R.T. (1973). Report on the results of exploration on E.L. 1/69 Jan. 72 - Sept. 73. Australia & New Zealand Expl. Co.

BRANDT, R.T. (1974A). Report on the results of exploration on E.L. 17/68 Oct. 71 - May 74. Australia & New Zealand Expl. Co.

BRANDT, R.T. (1974B). Final report on E.L. 1/69 for the period Sept. 73 to June 74. Australia & New Zealand Expl. Co.

BURNS, K.L. (1957). The geology of the Nook-Gunns Plains area. Unpubl. B.Sc. Hons. Thesis Univ. of Tas.

BURNS, K.L. (1960). Cambrian lithostratigraphy, Nook-Preston-Penguin area. Tas. Dept. Mines Tech. Rep. 4:46-49.

BURNS, K.L. (1961). The Iron Cliffs Mine, Penguin. Tas. Dept. Mines Tech. Rep. 5:117-136. Plus 2 maps.

BURNS, K.L. (1963B). Devonport map sheet 1:63,360 series. Geological Atlas. Tas. Dept. Mines.

BURNS, K.L. (1964). One mile geological map series K/55-6-29 Devonport. Explan. Rep. Geol. Surv. Tas.

EVERARD, G. (1963A). Petrological notes, specimens from Penguin, collected by K.L. Burns. Tas. Dept. Mines Tech. Rep. 7:104-105.

EVERARD, G. (1963B). Petrological notes on specimens from Dial Range, collected by S.M. Rowe. Tas. Dept. Mines Tech. Rep. 7:105-106.

GEE, R.D. (1967). Burnie Map Sheet. 1:63,360 series. Geological Atlas. Tas. Dept. Mines.

GEE, R.D. (1977). One mile geological map series, Burnie. Expl. Rep. Geol. Surv. Tas.

GOODEVE, P.E. (1955). Preliminary report on aeromagnetic survey over Hampshire & Blythe River areas, Tasmania. Bur. Min. Resour. Aust. Rec. 1955/106.

HEWITT, W.V. (1968). Geophysical survey Penguin Beach E.L. 15/65. BHP Co. Ltd. Tas. Dept. Mines Open File Rep. Q29/4.

HUGHES, T.D. (1953b). The Dial Range Mineral Field. Unpubl. Trans. Tas. Dept. Mines.

HUGHES, T.D. (1957). Limestones in Tasmania. Tas. Dept. Mines Geol. Surv. Min. Resour. 10:149-154.

HUGHES, W.D. (1961). Magnetite deposits at Loyetea. Tas. Dept. Mines Tech. Rep. 5:98-99.

JACK, R. (1965A). Drilling results, Hampshire Iron Ore deposits. Tas. Dept. Mines Tech Rep. 9:22-25.

JACJ, R. (1965B). Natone Manganese deposit. Tas. Dept. Mines Tech Rep. 9:20-21.

JACK, R. (1965C). Highclere Iron deposit. Tas. Dept. Mines Tech Rep. 9:37-42.

JENNINGS, I.B. et al (1959). Sheffield Map sheet, 1:63,360 series. Geol. Atlas. Tas. Dept. Mines.

JENNINGS, D.J. (1968). Iron Ore at Penguin Creek, a magnetometer survey. Tas. Dept. Mines Tech Rep. 12:43-44.

LONGMAN, M.J. (1962A). Iron ore at Penguin Creek. Tas. Dept. Mines Tech. Rep. 6:18-20.

MATTHEWS, W.L. (1964). Geology of the Penguin area. Tas. Dept. Mines Tech. Rep. 9:96-101.

MATTHEWS, W.L. (1977). Examination of Groom's & Lonah slips, near Penguin. Tas. Dept. Mines Tech Rep. 20:159-164.

MONTGOMERY, A. (1896). Report on the mineral fields of the Gawler River, Penguin, Dial Range, Mt. Housetop, Table Cape, Cam River and portion of the Arthur River districts. Tas. Rep. Sec. Mines 1895-6:i-xx.

OAKES, G.D. (1983). Summary of Geophysical surveys in 1982 on the Moina-Housetop JV area, NW Tasmania. Unpubl. Shell Rep. No. 08.2259.

PORTER, T.M. (1972). E.L. 4/72 Highclere, NW Tasmania. Final Report. CRA Expl. Pty. Ltd. Tas. Dept. Mines Open File Rep. Q28/19.

SHEEHAN, G.M. (1969). The gravity field in the Sheffield area. Unpubl. B.Sc. Hons. Thesis Univ. of Tas.

SMITH, J.H. (1899). Report on the Penguin & Dial Range Mineral Fields. Ann. Rep. Sec. Min. Tas. for 1898-99.

SMITH, W.C. (1960). Penguin Creek deposits & Iron Cliffs lode geological report. BHP Co. Ltd. Tas. Dept. Mines Open File Rep. Q29/1.

SPRY, A.H. (1957). The Precambrian rocks of Tasmania, Part 1. Dolerites of the Northwest Coast of Tasmania. Pap. Proc. R. Soc. Tas. 91, p.81-73.

TWELVETREES, W.H. (1903). Report on the Dial Range and some other mineral districts on the NW coast Tas. Tas. Dept. Mines Rep. No.5.

TWELVETREES, W.H. (1906). Ann. Rep. Sec. Min. tas. for 1905.

TWELVETREES, W.H. (1909). Gunns Plains, Alma & other mining fields, NW coast. Geol. Surv. Tas. Bull. 5.

WESTE, G. (1979). E.L.8/77 Riana. Report on all investigations to Dec. 1979. Commonwealth Aluminium Corp. Ltd. Unpubl.

WILLIAMS, E. & TURNER, N.J. (1973). Burnie map sheet 1:250000 series, Geol. Atlas Tas. Dept. Mines.

WILLIAMS, E. & TURNER, N.J. (1974). Geological Atlas 1:250000 series, Burnie. Explan. Rep. Geol. Surv. Tas.

TABLE 1

AIRBORNE ANOMALY LIST

PROSPECT : RIANA SURVEY : AEROMAG UPDATED 21/8/84

Anomaly Number	Line and Fiducial	Name	Location (AMG)	Description	Follow-up to Date	Modelling and Interpretation	Geology	Future Work
4042/1	6.02869 5.03485	Laurel Creek W.	409000E 5425200N	Large, narrow anomaly	Mag, geochem, Drill	Skarn (narrow)	Granite-magnetite Skarn	None
4042/2	8.01578	Laurel Creek N. (Housetop)	409500E 5427300N	- Small and Broad - Look formational	Mag, geochem, geol.		Magnetite-bearing Granite	None
4042/8			407000E 5424000N	N of Laurel Creek S.			Granite	Depends on 4042/2 - None
4042/9			408100E 5423600N	E of Laurel Creek S.			Granite	Depends on 4042/3 - None
4042/10			407500E 5429800N	W of Laurel Creek W.				None
4042/11			409000E 5424400N	Group of anomalies to S of Laurel Creek W.			Minor magnetite Skarn?	None
4042/12			407700E 5425800N	NW of Laurel Creek W.			Granite	Depends on 4042/2 - None
4042/13			408300E 5425700N	NW of Laurel Creek W.			Granite	Depends on 4042/12 - None
4042/14			409800E 5425500N	Large low to W of Peak Hill Farm	Mag.	Remanence?	Basalt?	None
4043/2	243.5119	Ellis Creek N.			Recce. line?	Possible basalt hill	Basalt over granite contact	Depends on 4043/IR5-None
4142/2	21.9253	Loyet ea E	412800E 5427700N		Mag., Gravity		Basalt	None
4142/3		Lowana Ck.	415400E 5429600N		Ground Check	Basalt cap?	Basalt on Om?	None
4142/4	46.2615	Castra (Preston)	419600E 5425700N	Mag., high with elevated K	Mag, remanence	Basalt source	Basalt on Og	None
4142/9	22.9218	Redwater North	412800E 5426500N		Ground Check		Basalt??? over Om	None
4142/10	27.7277	Gunn's Plain	414400E 5423700N			volcs.	Cambrian Volcanics?	None
4142/11	19.938	Loyet ea W.		Mag and elevated radiometrics	Mag. Geochem	volcs.	Cambrian Volcanics? on Granite contact	None
4142/12	16.9617	Peak Hill		Moderate K' for source at 60m depth				None
4142/13			410900E 5426800N	Northern extension of Redwater anomaly			Minor skarn?	None
4142/14			412000E 5426000N	E of Redwater			Basalt	None
4142/15			413600E 5429500N	NE of Loyet ea			Basalt over €volcs?	None
4142/16			413100E 5429800N	NE of Loyet ea			Basalt/granite	None

028

3440029

AIRBORNE ANOMALY LIST

TABLE 1 (cont.)

PROSPECT : RIANA SURVEY : AEROMAG UPDATED 21/8/84

Anomaly Number	Line and Fiducial	Name	Location (AMG)	Description	Follow-up to Date	Modelling and Interpretation	Geology	Future Work
4143/1	33.6907		415800E 5431700N	Strong, mag., but poorly Shaped		Basalt hill	Basalt on Ord. or Cambrian?	None
4143/2	258.57115	Wattle Grove	413400E 5435700N	Strong isolated mag	mag, geochem, geol.	Basalt hill	Basalt over Granite	None
4143/3	243.51275	Stotts Rd.	412800E 5439500N	Strong mag	Ground Check mag,	Basalt hill	Basalt	None
4143/4	261.4908	S. Riana	413300E 5434900N		mag, remanence	Basalt hill	Basalt	None
4144/3	237.4793	Midgley Falls	415100E 5441000N	Related to topography? V. high K	Ground Check mag, remanence IP	Basalt capping	Basalt	None
4244/1	212.36765	Penguin	423500E 5447300N		Ground Check	Fe-rich seds	North margin of Penguin Ag-Pb, E. Volc.	None
4244/2	212.36800	Neptune	424500E		Ground Check	C Volcs,	West margin of Penguin Ag-Pb, E. Volc.	None
4244/3	205.38460	Dial Pt	420600E 5449100N	300 nT	Ground Check	Basalt hill	Basalt?	None

AIRBORNE ANOMALY LIST

TABLE 2

PROSPECT . RIANA

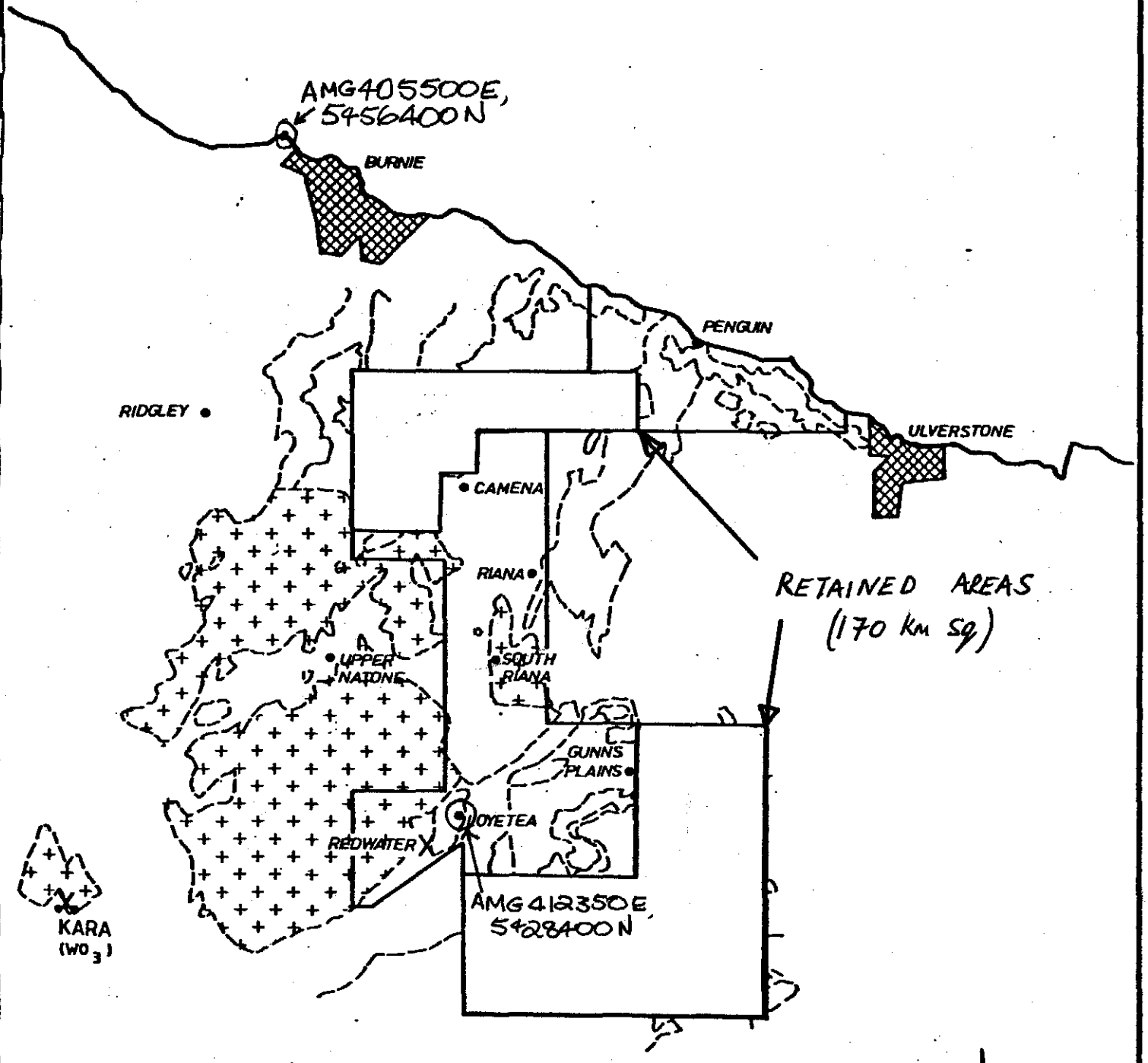
SURVEY : INPUT

UPDATED 21/8/84

Anomaly Number	Line and Fiducial	Name	Location (AMG)	Description	Follow-up to Date	Modelling and Interpretation	Geology	Future Work
4144/IR1	1251.38141 - 1221?		415400E 5442900N	- 6 Channel response in conductive surficial [illegible] - Priority 3	Ground Check Mag, IP	Basalt bash (conductive clays)	- Near gravity low CL 11 Basalt over 0	None
4043/IR5	1042.35424		409800E 5439800N	- Priority 3 INPUT - probably cultural mag correl	Ground Check	Cultural? & Topo high?	Basalt on Granite?	None
4144/IR10							Basalt over 0g?	Depends on 4144/IR11
4144/IR11		Midgley Falls		See 4144/3	Mag, IP, Remanence	Magmod. Basalt capping	Basalt over 0g?	None

031

344032



AMG REFERENCE POINTS ADDED

5 cm

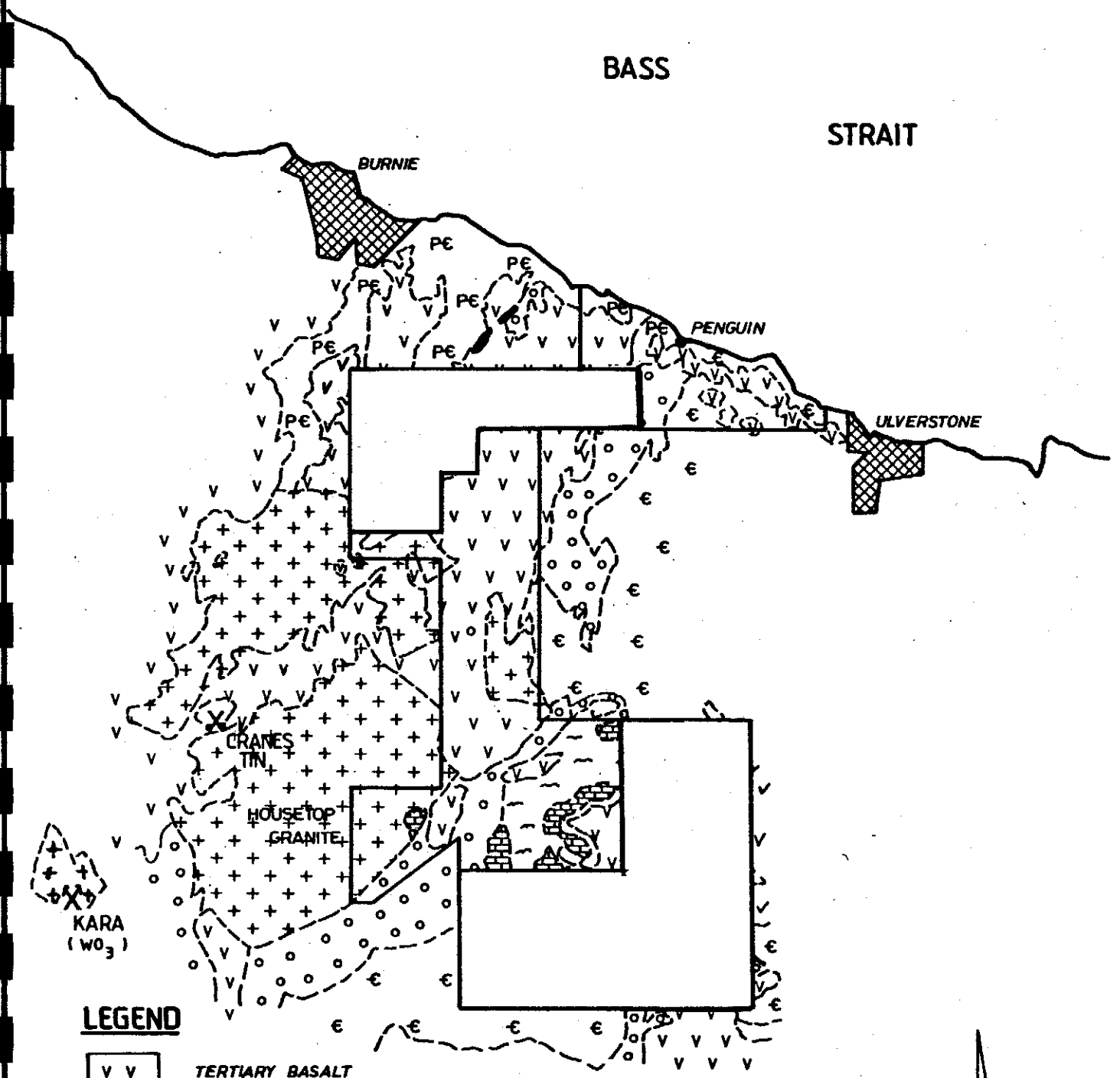
The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
LOCATION PLAN (R)

SCALE 1:250 000	DATE 5-8-84
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG.No. D/H004/184	FIG.No. 1

032

344033



LEGEND

- TERTIARY BASALT
- ALLUVIUM
- HOUSETOP GRANITE
- GORDON LIMESTONE
- ORDOVICIAN SANDSTONE CONGLOMERATE
- CAMBRIAN
- OONAH FORMATION
- PRECAMBRIAN

5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA (R)

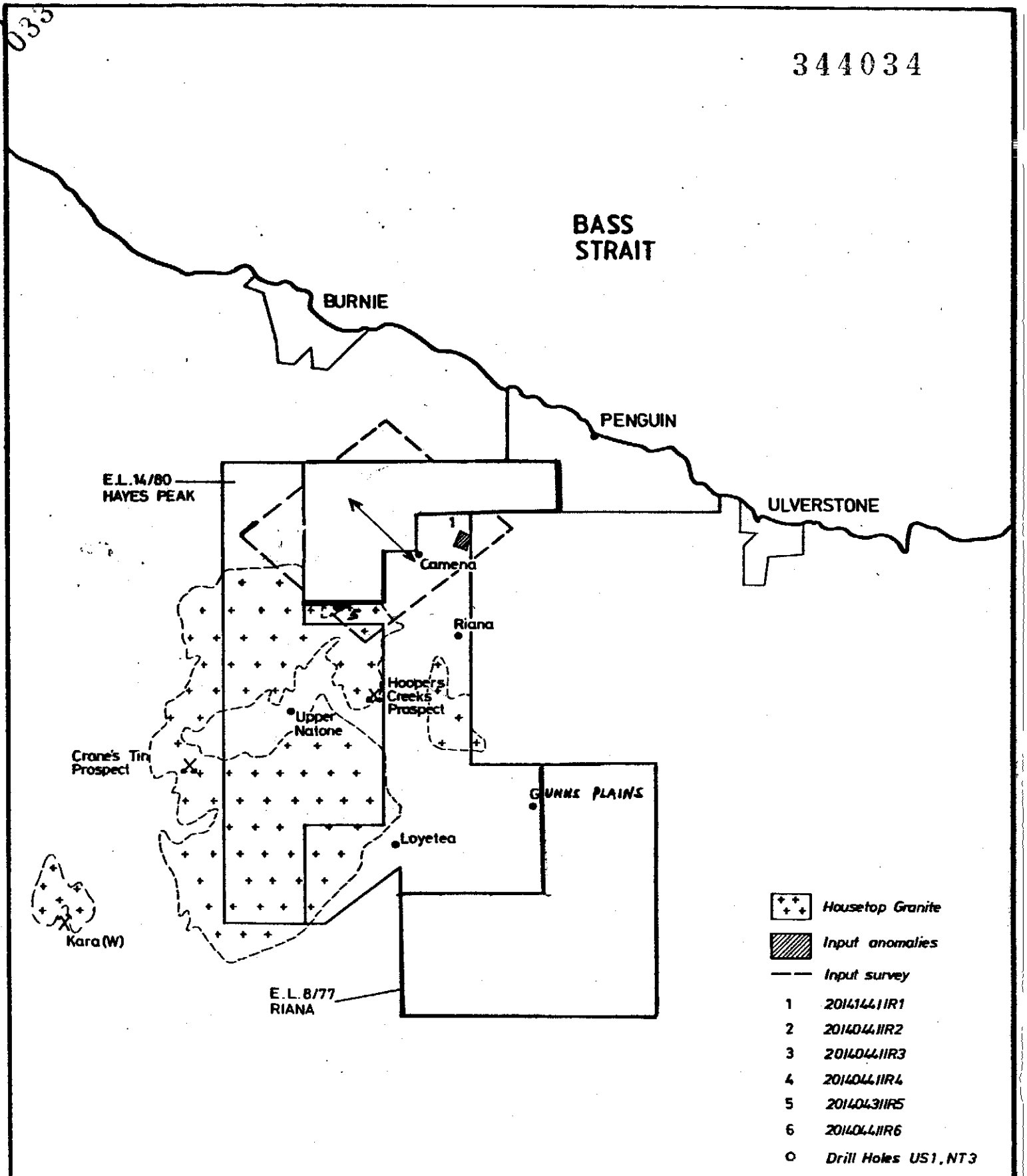
GEOLOGY

SCALE 1:250000	DATE 5-8-84
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.

DRG No D/M004/185 FIG No. 2

033

344034



The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA AND
E.L. 14/80 HAYES PEAK (R)
INPUT SURVEY AND
ANOMALIES PLUS DRILL HOLE
INFORMATION

SCALE 1: 250000	DATE 5-8-84
AUTHOR P.R.	DRAWN H.L.H.
OFFICE DEVONPORT	REP.No.
DRG No. D/M004/109	FIG No 3

HAYES PEAK E.L. 14/80

Loyetea West 4142/1

Lowana Creek 4142/3

RIANA E.L. 8/77

Loyetea East 4142/2

Housetop 4042/2

Redwater 4142/1

Redwater North 4142/9

Peak Hill

Peak Hill Farm

Laurel Creek West 4142/1

LOONGANA E.L. 36/79

E.L. BOUNDARIES

APPROX. POSITIONS OF GRIDDED AREAS (SHELL)

5 cm

344035

50 0 50 100 M

The Shell Company of Australia Limited
METALS DIVISION

M.T. 24 TASMANIA REGIONAL
Aeromagnetic map of the Southern margin of the Housetop Granite
(From sheets 4142 & 4042)

SCALE	1:20000	DATE	24-6-82
AUTHOR	P RUXTON	DRAWN	H L H
OFFICE	DEVONPORT	REP No	
ENCL No	FIG. 4.	DRG No	D/MT24/024

035

344036

APPENDIX 1

SOUTHERN LICENCE AREA

REDWATER - LOYETEA Aeromagnetic Trend

a) Geological summary of the Redwater Prospect
   - drill logs RED 1, 2 & 3, RD 4 & 5
   - magnetic susceptibilities on drillcore

b) Laurel Creek West Prospect
   - drill log LCW PDH 1

7. GROUP 1 : GROUND FOLLOW-UP ALONG THE SOUTH-EASTERN EDGE OF THE HOUSETOP GRANITE

7.1. REDWATER PROSPECT

7.1.1. Summary of Comalco Investigations

The presence of tin bearing magnetite skarn near the junction of Puffers and Redwater Creeks led to the establishment of a grid over the Redwater Prospect. After the gridding; soil sampling, ground magnetics and I.P. surveys were carried out (for details see G. Weste, 1979). An evaluation of the geophysical data was made to determine the possibility of a Kara-type scheelite skarn or a Renison-type pyrrhotite-cassiterite skarn being present.

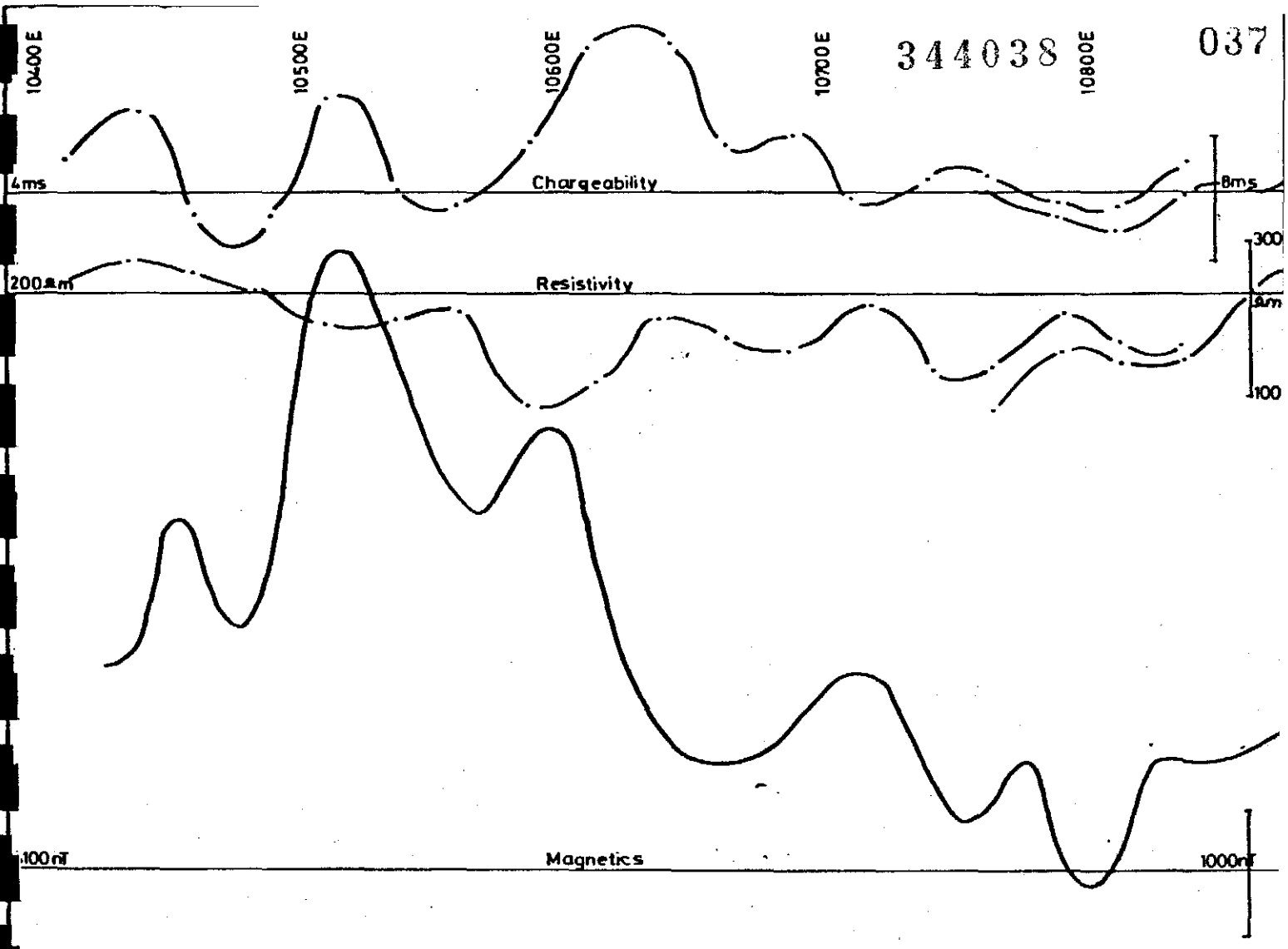
Three diamond drill holes were drilled on the Redwater Prospect by Comalco. Holes RED 1 and RED 2 both intersected magnetite skarn and wrigglite in Gordon limestone, however assay results were not encouraging. A third hole RED 3, was drilled into a broad magnetic high. This hole was terminated due to bad ground (Refer plan D/MQ04/053 for drill hole locations and Appendix 2 for summary logs).

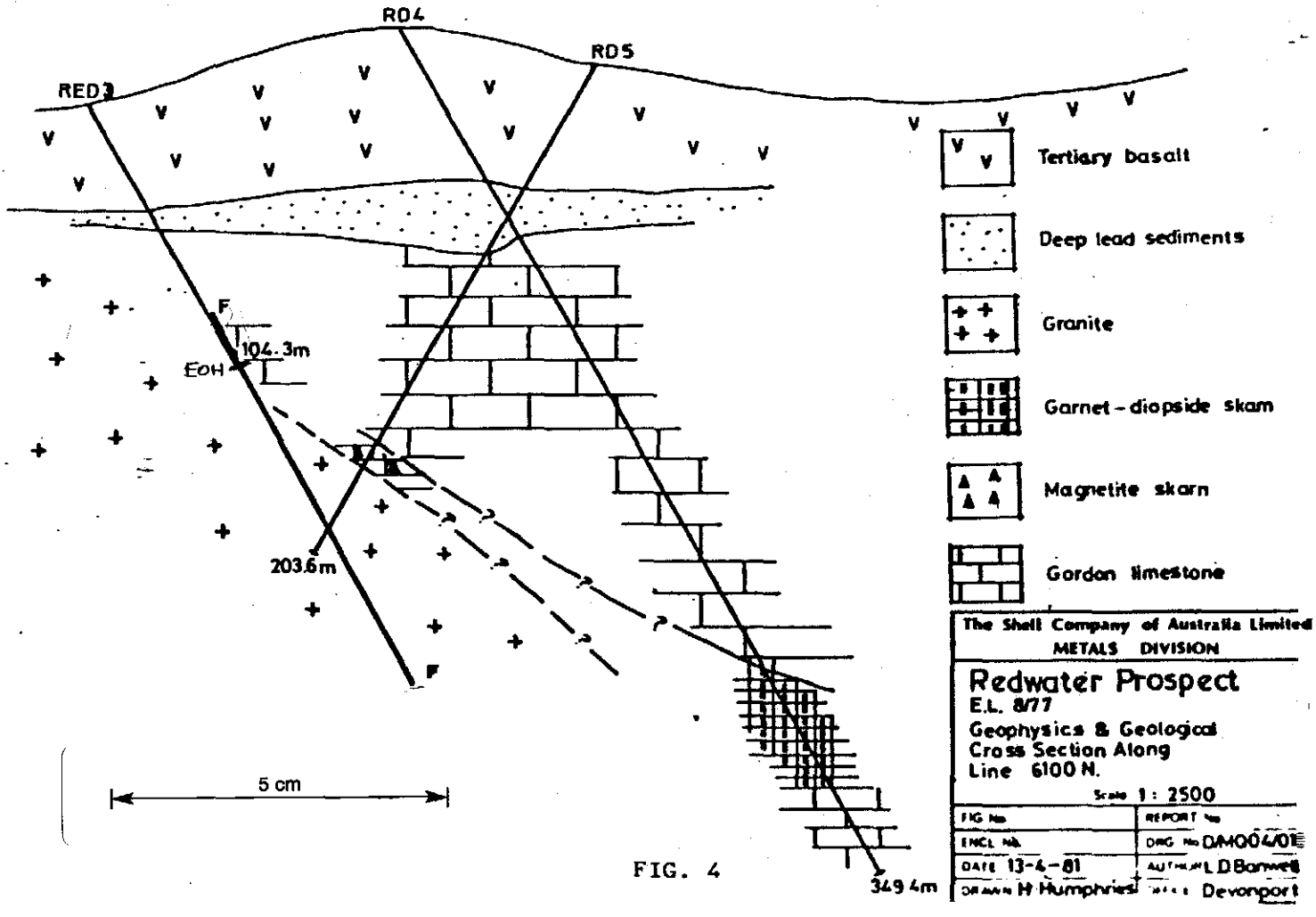
7.1.2. Summary of Shell Investigations

Grid extensions - A second aeromagnetic anomaly in the Redwater area, not covered by the Comalco grid, was located during the initial evaluation of the Geometrics airborne survey. The Comalco grid was extended to the south to cover this anomaly (4142/1) at Peak Hill Farm, and a ground magnetics survey was carried out, line spacing of 100m, station spacing of 25m and the bearing of the lines being 078° magnetic, but no soil sampling was done due to extensive basalt cover. (Refer plan D/MQ04/014 for stacked magnetic profiles over Peak Hill Farm Grid). The response over this anomaly was a 'noisy' one, indicating a fairly thick basalt cover in the area.

Drilling - As drill hole RED 3 was terminated early, it did not test the magnetic anomaly on line 6100N as intended. (Refer Fig. 4). Fifty metres to the east of the magnetic anomaly, along line 6100N, the Comalco I.P. survey had outlined a chargeability high with an associated

344038 037





The Shell Company of Australia Limited
METALS DIVISION

Redwater Prospect
E.L. 8/77
Geophysics & Geological Cross Section Along Line 6100 N.

Scale 1 : 2500

FIG No.	REPORT No.
ENCL No.	DRG No. DM004/01E
DATE 13-4-81	AUTHOR L.D.Barnwell
DRAWN H.Humphries	OFFICE Devonport

FIG. 4

resistivity low. Diamond drill hole RD 4 was drilled to test this I.P. anomaly, which is also associated with a cusp on the eastern edge of the main magnetic anomaly. (Refer plan D/MQ04/036).

Hole RD 4 was collared at 6100mN/10500mE, inclination 60° towards azimuth 080°M, and was drilled to a depth of 349.4m. A summary log is as follows:

Interval(m)	Lithology
0.0 - 65.7	Tertiary basalt.
65.7 - 82.0	Tertiary deep lead deposits including sandstone and conglomerate.
82.0 - 86.2	Tertiary brown palaeosoil.
86.2 - 267.2	Ordovician, grey, impure recrystallized limestone with abundant clayey cave fill.
267.2 - 274.3	Garnet-diopside skarn.
274.3 - 289.3	Brecciated garnet-diopside skarn, cross-cut by Tertiary basalt feeder channels and dykes.
289.3 - 308.1	Garnet-diopside skarn, cross-cut by Tertiary basalt dykes and feeder channels.
308.1 - 328.9	Extensively recrystallized limestone, cross-cut by Tertiary basalt dykes and feeder channels.
328.9 - 349.4	Recrystallized limestone.

Fillet samples of limestone and half core samples of skarn were sent to Amdel for analysis. Sn and W values were uniformly low, and no other elements were present at encouraging levels. For detailed geological logs and assays of RD 4 refer Appendix 3 and plans D/MQ04/035a and b. The core was photographed and measured for magnetic susceptibility. Results are available in Appendix 4.

Drill hole RD 5 was then collared at 6100mN/10620mE, with an inclination of 60°, towards azimuth of 260°M and drilled to a depth of 203.6m. This hole was designed to test the magnetic anomaly missed by RED 3 (Refer Fig. 3 and plan D/MQ04/036). A summary log is as follows:

039

344040

Interval(m)	Lithology
0.0 - 54.9	Tertiary basalt.
54.9 - 74.0	Tertiary deep lead deposits - fine clayey material to conglomerate.
74.0 - 80.8	Tertiary brown palaeosoil.
80.8 - 153.0	Ordovician, grey, recrystallized limestone with occassional clayey cave fill and skarnified bands.
153.0 - 154.2	Extensively weathered skarn.
154.2 - 159.8	Limestone.
159.8 - 168.2	Extensively weathered garnet-diopside and magnetite skarn.
168.2 - 182.8	Granite - quartz-orthclase-biotite-plagioclase.
182.8 - 183.8	Greisen - quartz-feldspar-chlorite-muscovite-biotite.
183.8 - 186.3	Granite.
186.3 - 191.7	Fault zone.
191.7 - 203.6	Granite.

Fillet samples of limestone and granite and half-core samples of skarn were analysed by Amdel. Sn and W values were low as are all other elements. (Refer App. 3). The core was photographed and measured for magnetic susceptibility (Refer App. 4).

Downhole Geophysical Surveys - Drill holes RD 4 and RD 5 were logged using a downhole magnetometer. Both holes were cased with P.V.C. piping to a depth of 90m and 80m respectively. It was hoped that geophysical data could be collected across the skarn intervals, as well as through the Tertiary basalt cover. Unfortunately both holes caved below the casing and logging of the skarn intersection in both holes was not possible. The holes were logged as deep as possible - 90m for RD 4 and 130m for RD 5. The information is presently being assessed by computer at A.H.O. and results are awaited. The study may indicate whether the ground magnetic anomaly reflects the basalt or deeper magnetite skarn mineralization.

7.1.3. Conclusions

The work done by Shell at Redwater was designed to follow-up Comalco work and to test geophysical anomalies. Diamond drill hole RD 5 indicated the presence of magnetite skarn, but possibly not in sufficient quantity to account for the ground magnetic anomaly. It may be that a larger body of skarn is present, than is indicated by RD 5. This, by itself is encouraging, but unfortunately, the geochemistry of the skarn is very disappointing. All drill holes,

344041

both Comalco and Shell, gave low Sn and W values when assayed. While initially the area looked prospective for the presence of Kara-style mineralization, the lack of high tungsten and tin values downgrades the potential of the Redwater prospect.

7.2. LAUREL CREEK WEST

7.2.1. General

Laurel Creek West (anomaly 4042/1) represents the south western end of the 8 km long, highly magnetic belt which delineates the south eastern edge of the Housetop Granite. The prospect covers the contact between the Devonian Housetop Granite and Ordovician sediments (mainly quartzites). A large area of the prospect is covered by Tertiary basalt. Field relationships and actual lithologies are difficult to determine, due to lack of outcrop, and logging of auger sample chips provided the basis for a rough geological map of the area. Inaccessibility was also a problem at this prospect as most of the western half of the grid is covered by very dense 'horizontal scrub'.

The major part of the grid was established in late 1980, however it was found that this initial grid did not completely cover the aeromagnetic feature. An extension was recently made to the grid that allowed total ground coverage of the anomaly.

7.2.2. Gridding

The grid at Laurel Creek West covers an area of 1.1 sq. km. and consists of east/west trending grid lines, with a line spacing of 100m and a peg spacing of 50m. The base line was pegged along 348^{o}M.

7.2.3. Geological Mapping

Due to limited outcrop, very little surface mapping was possible. Chips from the soil sample auger holes were logged by I. Buchhorn, who was then able to produce a rough geological map of the prospect. The attitude of the sedimentary rocks and the nature of

the sediment-granite contact were difficult to determine.

7.2.4. Soil Sampling

Soil sampling was done at 50 metre intervals along the grid lines. A total of 190 samples were taken, with an average soil sample depth of 0.7 metres (range 0.05m - 2.3m). The samples were dry seived with the -80# portion being sent away for analysis. Analyses were done by Comlabs and included Cu, Pb, Zn, Ni, Fe, Mn, Sn, W (for analytical method refer App. 5). For geochemical results refer plans D/MQ04/049, 050 and 051.

Overlapping Cu, Pb, Zn, Ni and Fe anomalies occur at this prospect. They form roughly linear trends, running north-south, parallel and to the east of the magnetic feature and the granite contact. Sn and W values are fairly low and sporadic, with highest values being recorded over the granite.

7.2.5. Ground Magnetics Survey

Readings were taken every 25 metres along the 100 metre spaced grid lines with a Geometrics 4816 proton precession magnetometer. All readings were corrected for diurnal drift using base station readings. The ground magnetic data and contours are plotted on plan D/MQ04/043.

The main feature of the magnetics is a long (approx. 1km), narrow, very intense belt of highs and associated lows, that delineates the edge of the granite. The width of the feature suggests that the source of the anomaly is shallow, probably less than 50 metres and narrow. The geology plus magnetics suggests that the source is a narrow skarn on the contact of Ordovician sediments with the granite.

7.2.6. Drilling

A percussion drill hole is to be drilled in the very near future with a view to testing the ground magnetic anomaly. The hole will be located as near as practicable to 2225N/2275E, and will be drilled until granite is reached.

7.2.7. Conclusions

The geology and ground magnetics seem to indicate the presence of a skarn against the edge of the Housetop Granite. The patchy, but high, Sn and W values recorded in soil above the granite suggest that the skarn next to the granite may be mineralized. At the moment it is impossible to predict whether what is present at Laurel Creek West is similar to the Redwater Prospect (i.e. a magnetite skarn against the granite, but with only very low tin and/or tungsten content) or whether the skarn will be mineralized. The drilling of a percussion hole should provide the assay information necessary to decide whether further cored drilling is warranted.

2.1 Laurel Creek West (4042/1)

A percussion drill hole collared at 2225 N/2275 E was drilled on the Laurel Creek West grid to explain a ground magnetic anomaly at the Gordon Limestone/Housetop Granite contact. Ten metres of barren magnetite skarn was intersected at the limestone/granite contact between 48 m and 58 m depth. The magnetic skarn was clearly the source of the ground magnetic anomaly with magnetic susceptibilities of upto 100 000 x 10^{-6} cgs units. Maximum assay values include 310 ppm Sn, 60 ppm W, 55 ppm Cu, 350 ppm Pb, 360 ppm As and 490 ppm Zn (Refer Appendix 1). The hole bottomed in granite at 120 m depth.

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

Hole No : COMALCO RED 1

PROJECT : REDWATER

LOCATION CODE : MQ 04

COLLAR CO-ORDINATES : 10912E/64135N

COLLAR R.L. :

LOCATION :

MAP/PHOTO REFERENCE :

DATE STARTED	March 1979	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	
DATE FINISHED	April 1979	NON CORE					Nº OF TRAYS	18
TOTAL DEPTH	146.0m						SAMPLE STORAGE	
LOGGED BY	G. Weste	CORE					ASSAY LAB.	Amdel
CONTRACTOR	Comalco						ASSAY REPORTS	
RIG	Joy HD22 Diam.							
DRILL CREW	J. James	CASING					MIN. & PET. LAB.	
	L. Gardam						MIN. & PET. REPORTS	
		CASING LEFT						

HOLE SURVEY DATA

INSTRUMENT :

DEPTH	INSTRUMENT INCL.	INSTRUMENT AZ.	ACID ETCH INCL.	ACID ETCH AZ.	REMARKS
COLLAR	50°	123			

GRAPHIC/LETTER SYMBOL LOGGING KEY

STRUCTURE / ALTERATION CODE

B BEDDING
J JOINTING
C CLEAVAGE
F FOLIATION
sh SHEARING
q QUARTZ VEINS
O OXIDATION

DRILLING SUMMARY :

34102

[redacted]

PROJECT: REDWATER — DIAMOND DRILL LOG - SAMPLING RECORD — Comalco HOLE NO: RED 1

From	To	Length	Core Recovery	% Rec.	Sample No.	Comments No.	Assays Sn	W	CaF_2	Cu	Pb	Zn	Mo	Au	Weighted Assays Ratios	% Estimates	Core Angles	A.S.	P.S.	Description
0.00	1.50	1.50																		Basalt and sandstone boulders.
1.50	3.00	1.50					130	35		30	20	200	15							Recemented magnetite pebbles with minor clay.
3.00	6.00	3.00					160	25		30	20	500	3							Grey silty
6.00	6.85	0.85					100	55		150	30	300	10							Grey silty
6.85	7.00	0.15					110	45		150	30	300	15							Grey silty
7.00	9.00	2.00																		Grey silty
9.00	20.65	11.65																		Lake deposits
20.65	20.90	0.25					170	45		15	50	500	15							Lake deposits with detrital magnetite and silty clay.
20.90	24.20	3.30																		Lake deposits
24.20	24.80	0.60																		Heavily weathered limestone.
24.80	47.85	22.95																		Grey recrystallized limestone
47.85	48.65	0.80					6	<10		5	20	80	<3							Grey recrystallized limestone
48.65	49.50	0.85					<4	<10		15	15	80	<3							Grey recrystallized limestone
49.50	54.40	4.90																		Grey recrystallized limestone.
54.40	56.90	1.50																		Cave-fill
56.90	58.39	1.49																		Altered limestone - chlorite + laumontite present.
58.39	58.72	0.33					4	30		15	30	500	<3							Altered cave-fill - chloritized.
58.72	60.70	1.98					130	10		10	30	700	<3							Weathered magnetite skarn.
60.70	61.00	0.30																		Altered limestone
61.00	62.07	1.07																		Cave-fill.
62.07	63.70	1.63																		Altered limestone
63.70	69.80	6.10																		Fractured limestone
69.80	77.25	7.45																		Cave-fill
77.25	78.00	0.75					70	30		150	30	300	15							Massive magnetite skarn
78.00	80.40	2.40																		Cave-fill
80.40	108.82	28.42																		Limestone
108.82	109.47	0.65					<4	<10		4	20	50	<3							Limestone
109.47	119.00	9.53																		Limestone
119.00	120.00	1.00					<4	<10		4	20	100	<3							Limestone
120.00	120.83	0.83					65	35		25	30	150	20							Wollastonite and calc-silicates.
120.83	139.80	18.87																		Limestone
139.80	140.30	0.50					<4	<10		5	20	120	<3							Granite
140.30	146.00	5.70																		Granite

043

344046

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

Hole No : COMALCO RED 2

PROJECT : REDWATER

LOCATION CODE : MO 04

COLLAR CO-ORDINATES : 6507N/10997E

COLLAR R.L. : .....

LOCATION : .....

MAP/PHOTO REFERENCE : .....

DATE STARTED	APRIL 1979	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	
DATE FINISHED	MAY 1979	NON CORE					Nº OF TRAYS	9
TOTAL DEPTH	58.85m						SAMPLE STORAGE	
LOGGED BY	G. Weste	CORE	HQ	Om	4.5m	4.5m	ASSAY LAB.	Amdel
CONTRACTOR	Comalco		NQ	4.5m	41.36	36.86	ASSAY REPORTS	
RIG	JOY HD22 Diam.		BQ	41.36	58.85	17.49		
DRILL CREW	J. James	CASING					MIN. & PET. LAB.	
	L. Gardam						MIN. & PET. REPORTS	
		CASING LEFT						

HOLE SURVEY DATA

INSTRUMENT :

DEPTH	INSTRUMENT INCL.	INSTRUMENT AZ.	ACID ETCH INCL.	ACID ETCH AZ.	REMARKS
COLLAR	55°	103			

GRAPHIC/LETTER SYMBOL LOGGING KEY

STRUCTURE / ALTERATION CODE

B BEDDING
J JOINTING
C CLEAVAGE
F FOLIATION
sh SHEARING
q QUARTZ VEINS
O OXIDATION

DRILLING SUMMARY : _____

[redacted]

PROJECT: REDWATER — DIAMOND DRILL LOG - SAMPLING RECORD — HOLE No: RED. 2

From	To	Interval	Core Rec'd	% Rec	Sample No.	Comp. No.	Assays Sn	W	CaF_2	Cu	Pb	Zn	Mo	Au	Weighted Assays Ratios	% Recoveries	Core Angles	Alt	P.S	Description
0.00	1.00	1.00																		Soil.
1.00	1.40	0.40																		Granite pebbles.
1.40	1.50	0.10					440	75		200	100	5000	6							Massive magnetite skarn.
1.50	1.80	0.30																		Magnetite - quartz sand.
1.80	2.00	0.20																		Granite pebbles.
2.00	6.00	4.00					110	<10		10	30	500	<3							Fractured magnetite skarn.
6.00	7.20	1.20																		Clayey sand with magnetite & quartz.
7.20	9.85	2.65																		Clay & cave-fill.
9.85	10.50	0.65					14	45		30	50	300	<3							Clay & cave-fill.
10.50	15.00	4.50																		Clay & cave-fill.
15.00	17.55	2.55																		Limestone.
17.55	18.15	0.60					<4	<10		8	10	300	<3							Limestone.
18.15	21.50	3.35																		Limestone.
21.50	21.60	0.10																		Magnetite skarn with minor wrigglite.
21.60	21.75	0.15																		Granite vein.
21.75	22.00	0.25					44	50		30	70	500	10							Wrigglite & calc-silicates.
22.00	22.10	0.10																		Granite vein.
22.10	22.20	0.10																		Wrigglite.
22.20	22.75	0.55																		Cave-fill.
22.75	22.85	0.10																		Wrigglite & calc-silicates.
22.85	23.95	1.10																		Granite vein.
23.95	24.00	0.05																		Wrigglite.
24.00	25.10	1.10																		Cave-fill.
25.10	25.50	0.40																		Magnetite, garnet, biotite, chlorite rock.
25.50	26.35	0.85					130	40		40	30	1100	3							Magnetite, garnet, biotite, chlorite rock.
26.35	26.50	0.15																		Granite vein.
26.50	27.26	0.76					170	40		30	30	1000	<3							Magnetite skarn with irregular granite vein.
27.26	28.30	1.04					220	<10		20	50	1200	<3							Magnetite and calc-silicate skarn - ill-defined banding.
28.30	29.25	0.95					210	40		20	50	1100	<3							Magnetite & calc-silicate skarn.
29.25	30.20	0.95					190	40		20	50	1200	<3							Magnetite & calc-silicate skarn.
30.20	31.25	1.05					220	<10		40	50	1200	<3							Magnetite & calc-silicate skarn.
31.25	32.25	1.00					180	45		40	40	1200	<3							Magnetite & calc-silicate skarn.
32.25	33.25	1.00					280	10		30	40	1200	<3							Magnetite & calc-silicate skarn.
33.25	34.25	1.00					270	25		110	60	1800	3							Magnetite & calc-silicate skarn.
34.25	35.20	0.95					210	70		110	60	1800	<3							Magnetite & calc-silicate skarn.
35.20	36.20	1.00					230	75		40	30	1800	<3							Magnetite & calc-silicate skarn.
36.20	37.20	1.00					210	<10		10	30	1100	<3							Magnetite & calc-silicate skarn.
37.20	38.18	0.98					240	20		10	20	1100	<3							Magnetite & calc-silicate skarn.
38.18	38.80	0.62					210	40		10	20	1200	<3							Magnetite & calc-silicate skarn.
38.80	39.50	0.70					430	40		10	10	110	<3							Calc-silicate skarn.
39.50	40.50	1.00					150	760		10	10	20	10							Calc-silicate skarn.
40.50	41.05	0.55					380	580		7	10	40	20							Granite.
41.05	41.90	0.85					240	50		20	20	130	<3							Granite.
41.90	42.50	0.60					12	20		7	10	20	<3							Granite
42.50	43.92	1.42					8	10		5	10	<20	<3							Granite.
43.92	44.20	0.28					8	15		1	10	<20	<3							Granite.

344048

The Shell Company of Australia Limited
METALS DIVISION

344049

048

DRILL LOG SHEET

Hole No : COMALCO RED 3

PROJECT : REDWATER

LOCATION CODE : MQ 04

COLLAR CO-ORDINATES : 10440E/6100N

COLLAR R.L. :

LOCATION :

MAP/PHOTO REFERENCE :

DATE STARTED	MAY 1979	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	
DATE FINISHED	JUNE 1979	NON CORE					Nº OF TRAYS	9
TOTAL DEPTH	104.1m						SAMPLE STORAGE	
LOGGED BY	G. Weste	CORE					ASSAY LAB.	Amdel
CONTRACTOR	Comalco						ASSAY REPORTS	
RIG	JOY HD22 Diam.							
DRILL CREW	J. James	CASING					MIN. & PET. LAB.	
	L. Gardam						MIN. & PET. REPORTS	
		CASING LEFT						

HOLE SURVEY DATA

INSTRUMENT :

DEPTH	INSTRUMENT INCL.	INSTRUMENT AZ.	ACID ETCH INCL.	ACID ETCH AZ.	REMARKS
COLLAR	60°	78°			

GRAPHIC / LETTER SYMBOL LOGGING KEY

STRUCTURE / ALTERATION CODE

B BEDDING
J JOINTING
C CLEAVAGE
F FOLIATION
sh SHEARING
q QUARTZ VEINS
O OXIDATION

DRILLING SUMMARY :

PROJECT: REDWATER

DIAMOND DRILL LOG - SAMPLING RECORD

Comalco
HOLE NO. RED 3

043

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Prep. No.	Assays Sn	W	F_2 %	Cu	Pb	Zn	Mo	Au	Weighted Assays Ratios				% Estimates			Core Angles			Alt.	Fol.	Description
0.00	47.05	47.05																									Basalt.
47.05	53.10	6.05																									Deep lead deposits.
53.10	99.60	46.50			1476		16	<10	0.06	4	10	22	1	<0.05													Granite.
99.60	102.40	2.80			1477		12	15	0.42	28	75	350	1	<0.05													Fault - fractured granite & limestone.
102.40	104.10	1.70			1478		6	<10	0.14	8	10	28	<1	<0.05													Limestone.

The shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

344051

050

PROJECT : REDWATER

Hole No : RD 4

COLLAR CO-ORDINATES : 6100mN/10500mE

LOCATION CODE : MQ 04

COLLAR R.L. : 443m

LOCATION :

MAP/PHOTO REFERENCE :

HOLE SURVEY DATA

INSTRUMENT :

DEPTH	INSTRUMENT INCL.	INSTRUMENT AZ.	ACID ETCH INCL.	ACID ETCH AZ.	REMARKS
COLLAR	60°	080°			
150m	61°	073°			
220m	59°	-			
265m	58°	057°			
311m	60°	068°			
349m	59°	077°			

DATE STARTED	14-12-80	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	
DATE FINISHED	10- 2-81	NON CORE					Nº OF TRAYS	48
TOTAL DEPTH	349.4m						SAMPLE STORAGE	
LOGGED BY	L.D. Banwell	CORE					ASSAY LAB.	Amdel
CONTRACTOR	A.D.D.	NQ		0	100m	100m	ASSAY REPORTS	
RIG	Mindrill F30	BQ		100m	349.4m	249.4m		
DRILL CREW	M. Blight	CASING					MIN. & PET. LAB.	
	N. Bellinger	NQ		0	100m	100m	MIN. & PET. REPORTS	
		CASING LEFT	PVC piping	0	80m	80m		

GRAPHIC / LETTER SYMBOL LOGGING KEY

STRUCTURE / ALTERATION CODE

B BEDDING
J JOINTING
C CLEAVAGE
F FOLIATION
sh SHEARING
q QUARTZ VEINS
O OXIDATION

DRILLING SUMMARY :

[redacted] OF [redacted]

PROJECT: REDWATER [redacted] D DRILL LOG - SAMPLING RECO[redacted] HOLE [redacted]

344052

051

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays Sn	W	CaF_2	Cu	Pb	Zn	Mo	Au	Weighted Assays/Ratios	% Estimates	Core Angles	Alt	T.S P.S	Description
0.00	11.22	11.22	9.08	81																Moderately weathered Tertiary basalt.
11.22	20.64	9.42	6.51	69																Palaeosoil.
20.64	60.53	39.89	39.89	100																Tertiary basalt with abundant zeolite veins and geoids.
60.53	65.73	5.20	4.26	82																Weathered Tertiary basalt.
65.73	82.03	16.30	6.89	42																Tertiary deep lead deposits, incl. greybilly, silt, to congl.
82.03	86.14	4.11	3.42	83																Clayey palaeosoil.
86.14	96.00	9.86	8.41	84	1401		<1	<50		8	15	20	<3	0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
96.00	106.00	10.00	9.04	90	1402		<1	<50		4	25	40	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
106.00	116.00	10.00	9.48	95	1403		<1	<50		2	20	<20	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
116.00	126.00	10.00	6.89	69	1404		<1	<50		3	30	40	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
126.00	136.00	10.00	8.21	82	1405		<1	<50		2	10	<20	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
136.00	146.00	10.00	8.05	80	1406		<1	<50		<1	15	<20	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
146.00	156.00	10.00	7.79	78	1407		<1	<50		3	25	40	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
156.00	166.00	10.00	9.10	91	1408		<1	<50		3	15	40	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
166.00	176.00	10.00	8.91	89	1409		<1	<50		2	15	<20	<3	0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
176.00	186.00	10.00	8.48	85	1410		<1	<50		4	15	40	<3	0.02						LIMESTONE - recrystallized, with occassional clayey cavefill.
186.00	196.00	10.00	8.67	87	1411		<1	<50		2	60	<20	<3	0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
196.00	206.00	10.00	9.90	99	1412		<1	<50		2	60	150	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
206.00	216.00	10.00	10.00	100	1413		<1	<50		4	40	80	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
216.00	226.00	10.00	9.84	98	1414		<1	<50		3	40	250	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
226.00	236.00	10.00	10.00	100	1415		<1	<50		3	30	40	<3	<0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
236.00	246.00	10.00	10.00	100	1416		<1	<50		3	20	250	<3	0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
246.00	256.00	10.00	10.00	100	1417		<1	<50		3	80	150	<3	0.05						LIMESTONE - recrystallized, with occassional clayey cavefill.
256.00	267.20	11.20	11.20	100	1418		<1	<50		4	60	80	<3	0.01						LIMESTONE - recrystallized, with occassional clayey cavefill.
267.20	269.20	2.00	2.00	100	1432	C1	36	<10		110	20	65	<1	<0.05						SKARN - garnet-diopside.
269.20	271.20	2.00	2.00	100	1433	C1	22	10	20	8	15	70	<1	<0.05						SKARN - garnet-diopside.
271.20	272.70	1.50	1.50	100	1434	C1	18	<10		16	25	100	<1	<0.05						SKARN - garnet-diopside.
272.70	274.30	1.60	1.60	100	1435	C1	40	<10		12	30	160	<1	<0.05						SKARN - garnet-diopside.
274.30	275.80	1.50	1.50	100	1436	C2	18	15		10	35	120	<1	<0.05						SKARN - garnet-diopside - brecciated.
275.80	276.10	.30	.30	100	1419		<1	<50		60	2	40	<3	<0.01						BASALT
276.10	278.10	2.00	2.00	100	1437	C2	26	<10		4	55	110	<1	<0.05						SKARN - garnet-diopside - brecciated.
278.10	279.40	1.30	1.30	100	1438	C2	32	<10	.20	30	25	65	<1	<0.05						SKARN - garnet-diopside.
279.40	279.50	.10	.10	100	1420		<1	<50		80	15	200	<3	0.06						BASALT
279.50	280.10	.60	.60	100	1438	C2	32	<10		30	25	65	<1	<0.05						SKARN - garnet-diopside - brecciated.
280.10	282.10	2.00	2.00	100	1439	C2	20	<10		75	20	100	<1	<0.05						SKARN - garnet-diopside - brecciated.
282.10	283.10	1.00	1.00	100	1421		<1	<50		60	1	<20	<3	<0.01						BASALT
283.10	283.30	.20	.20	100	1440	C3	12	<10		24	15	70	<1	<0.05						SKARN - garnet-diopside - brecciated.
283.30	283.80	.50	.50	100	1422		<1	<50		60	4	<20	<3	0.02						BASALT
[illegible]	285.30	1.50	1.50	100	1441	C3	4	<10	20	12	15	75	<1	<0.05						SKARN - garnet-diopside - brecciated.
285.30	286.80	1.50	1.50	100	1442	C3	16	10		8	20	100	<1	<0.05						SKARN - garnet-diopside - brecciated.
286.80	288.20	1.40	1.40	100	1443	C3	6	<10		8	10	60	<1	<0.05						SKARN
288.20	289.30	1.10	1.10	100	1423		<1	<50		80	6	<20	<3	<0.01						BASALT
289.30	290.80	1.50	1.50	100	1444	C4	16	10		6	15	85	<1	<0.05						SKARN - brecciated.
290.80	292.20	1.40	1.40	100	1445	C4	12	<10	.16	24	30	160	<1	<0.05						SKARN
292.20	292.80	.60	.60	100	1425	C4	<4	25		26	5	110	<1	<0.05						SKARN
292.80	294.40	1.60	1.60	100	1424		<1	<50		60	10	40	<3	<0.01						BASALT
294.40	296.40	2.00	2.00	100	1446	C5	10	<10		4	20	80	<1	<0.05						SKARN
296.40	298.40	2.00	2.00	100	1447	C5	6	<10		<2	40	80	<1	<0.05						SKARN
298.40	300.40	2.00	1.99	99	1448	C5	6	<10	.12	2	70	130	<1	<0.05						SKARN
300.40	302.40	2.00	1.99	99	1449	C5	6	<10		<2	35	65	<1	<0.05						SKARN
302.40	304.40	2.00	2.00	100	1450	C5	4	<10		2	25	60	4	<0.05						SKARN
304.40	305.50	1.10	1.10	100	1451	C5	<4	<10		<2	20	48	2	<0.05						SKARN
305.50	306.65	.95	.95	100	1425		<1	<50		60	1	40	<3	<0.01						BASALT
306.65	306.75	.10	.10	100	1452	C6	4	<10		2	25	55	2	<0.05						SKARN
306.75	306.90	.15	.15	100	1426		<1	<50		60	6	<20	<3	<0.01						BASALT
306.90	307.05	.15	.15	100	1453	C6	4	<10	.12	<2	65	110	1	<0.05						SKARN
307.05	308.15	1.10	1.10	100	1427		<1	<50		60	<1	<20	<3	<0.01						BASALT
308.15	309.05	.90	.90	100	1454	C6	<4	<10		14	45	90	2	<0.05						SKARN
309.05	313.57	4.52	4.52	100	1428		<1	<50		60	2	<20	3	<0.01						BASALT
313.57	315.50	1.93	1.92	99	1455	C7	8	<10		16	25	40	3	<0.05						LIMESTONE - extensively recrystallized
315.50	317.50	2.00	2.00	100	1456	C7	8	<10		8	50	70	7	<0.05						LIMESTONE
[illegible]	319.57	2.00	2.00	100	1457	C7	6	<10	.20	8	45	190	3	<0.05						LIMESTONE

[redacted]

052

PROJECT [redacted]

[redacted] DIAMOND DRILL

From	To	Interval (m)	Core Recvd	% Rec	Sample No.	Composite No.	Assays								Weighted	
							Au	As	Ni	Cr	Mn	Ti	Bi	Ba		
0.00	11.22	11.22	9.08	81												
11.22	20.64	9.42	6.51	69												
20.64	60.53	39.89	39.89	100												
60.53	65.73	5.20	4.26	82												
65.73	82.03	16.30	6.89	42												
82.03	86.14	4.11	3.42	83												
86.14	96.00	9.86	8.41	86	1401		.1	< 50	30	60	300	1000	< 1	400		
96.00	106.00	10.00	9.04	90	1402		< .1	< 50	15	20	250	600	< 1	< 200		
106.00	116.00	10.00	9.46	95	1403		< .1	< 50	20	20	300	200	< 1	200		
116.00	126.00	10.00	6.89	69	1404		.8	< 50	5	20	500	400	< 1	400		
126.00	136.00	10.00	8.71	82	1405		.1	< 50	15	40	250	400	< 1	200		
136.00	146.00	10.00	8.05	80	1406		< .1	< 50	5	20	100	300	< 1	< 200		
146.00	156.00	10.00	7.79	78	1407		.1	< 50	30	60	150	600	< 1	200		
156.00	166.00	10.00	9.10	91	1408		< .1	< 50	40	60	200	800	< 1	200		
166.00	176.00	10.00	8.91	89	1409		.6	< 50	40	60	500	600	< 1	200		
176.00	186.00	10.00	8.48	85	1410		< .1	< 50	20	60	150	400	< 1	< 200		
186.00	196.00	10.00	8.67	87	1411		< .1	< 50	20	40	150	400	< 1	< 200		
196.00	206.00	10.00	9.90	99	1412		< .1	< 50	< 5	40	200	300	< 1	600		
206.00	216.00	10.00	10.00	100	1413		< .1	< 50	5	40	200	400	< 1	< 200		
216.00	226.00	10.00	9.84	98	1414		< .1	< 50	5	40	300	600	< 1	< 200		
226.00	236.00	10.00	10.00	100	1415		< .1	< 50	10	60	300	600	< 1	200		
236.00	246.00	10.00	10.00	100	1416		< .1	< 50	5	60	250	300	< 1	200		
246.00	256.00	10.00	10.00	100	1417		< .1	< 50	< 5	20	300	300	< 1	< 200		
256.00	267.20	11.20	11.20	100	1418		< .1	< 50	20	40	200	400	< 1	200		
267.20	269.20	2.00	2.00	100	1432	C1	< 1	170	10	40	1500	1500	20	< 200		
269.20	271.20	2.00	2.00	100	1433	C1	< 1	150	15	40	1500	1500	10	< 200		
271.20	272.70	1.50	1.50	100	1434	C1	< 1	150	15	40	1500	1500	10	< 200		
272.70	274.30	1.60	1.60	100	1435	C1	< 1	170	15	40	1500	1500	10	< 200		
274.30	275.80	1.50	1.50	100	1436	C2	< 1	160	40	20	1000	2000	20	< 200		
275.80	276.10	.30	.30	100	1419		< .1	< 50	200	200	2000	> 1%	< 1	800		
276.10	278.10	2.00	2.00	100	1437	C2	< 1	140	20	20	1000	2000	20	< 200		
278.10	279.40	1.30	1.30	100	1438	C2	< 1	20	15	20	1000	2000	10	< 200		
279.40	279.50	.10	.10	100	1420		.2	< 50	100	200	200	> 1%	< 1	200		
279.50	280.10	.60	.60	100	1438	C2	< 1	20	15	20	1000	2000	10	< 200		
280.10	282.10	2.00	2.00	100	1439	C2	< 1	50	15	20	1000	2000	10	< 200		
282.10	283.10	1.00	1.00	100	1421		< .1	< 50	150	200	2000	> 1%	< 1	400		
283.10	283.30	.20	.20	100	1440	C3	< 1	20	25	20	800	1000	10	< 200		
283.30	283.80	.50	.50	100	1422		.1	< 50	150	200	1000	> 1%	< 1	400		
283.80	285.30	1.50	1.50	100	1441	C3	< 1	80	30	20	800	1000	10	< 200		
285.30	286.80	1.50	1.50	100	1442	C3	< 1	80	10	20	800	1000	10	< 200		
286.80	288.20	1.40	1.40	100	1443	C3	< 1	< 20	20	20	800	1000	10	< 200		
288.20	289.30	1.10	1.10	100	1423		.1	< 50	150	200	1500	> 1%	< 1	600		
289.30	290.80	1.50	1.50	100	1444	C4	< 1	< 20	15	60	800	3000	10	< 200		
290.80	292.20	1.40	1.40	100	1445	C4	< 1	< 20	15	60	800	3000	10	< 200		
292.20	292.80	.60	.60	100	1475	C4	< 1	< 20	160	60	800	3000	10	< 200		
292.80	294.40	1.60	1.60	100	1424		.1	< 50	200	200	800	> 1%	< 1	600		
294.40	296.40	2.00	2.00	100	1446	C5	< 1	< 20	15	20	400	800	10	< 200		
296.40	298.40	2.00	2.00	100	1447	C5	< 1	< 20	15	20	400	800	10	< 200		
298.40	300.40	2.00	1.99	99	1448	C5	< 1	< 20	10	20	400	800	10	< 200		
300.40	302.40	2.00	1.99	99	1449	C5	< 1	< 20	10	20	400	800	10	< 200		
302.40	304.40	2.00	2.00	100	1450	C5	< 1	< 20	10	20	400	800	10	< 200		
304.40	305.50	1.10	1.10	100	1451	C5	< 1	< 20	15	20	400	800	10	< 200		
305.50	306.45	.95	.95	100	1425		< .1	< 50	200	200	1500	> 1%	< 1	600		
306.45	306.75	.30	.30	100	1452	C6	< 1	< 20	10	20	250	1000	10	< 200		
306.75	306.90	.15	.15	100	1426		< .1	< 50	200	250	1500	> 1%	< 1	400		
306.90	307.05	.15	.15	100	1453	C6	< 1	< 20	20	< 20	250	1000	10	< 200		
307.05	308.15	1.10	1.10	100	1427		< .1	< 50	200	200	2000	> 1%	< 1	200		
308.15	309.05	.90	.90	100	1454	C6	< 1	< 20	15	< 20	250	1000	< 10	< 200		
309.05	313.57	4.52	4.52	100	1428		.2	< 50	200	200	1000	> 1%	< 1	400		
313.57	315.50	1.93	1.92	99	1455	C7	< 1	< 20	5	20	300	800	10	< 200		
315.50	317.50	2.00	2.00	100	1456	C7	< 1	< 20	20	20	300	800	10	< 200		
317.50	318.50	1.00	1.00	100	1457	C7	< 1	< 20	20	20	300	800	10	< 200		

344053

PROJECT: REDWATER — DRILL LOG - SAMPLING RECORD — HOLE NO: GRID 4

344054

From	To	Inter'l (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays Sn	W	CaF_2	Cu	Pb	Zn	Mo	Au	Weighted Assays/Ratios	% Estimates	Core Angles	Alt	I.S P.S	Description
319.50	321.50	2.00	1.98	99	1458	C7	4	10		10	40	180	2	<0.05						LIMESTONE
321.50	323.25	1.75	1.73	99	1459	C7	< 4	< 10		10	25	110	1	<0.05						LIMESTONE
323.25	323.90	.65	.64	99	1429		< 1	< 50		60	8	100	< 3	0.01						BASALT
323.90	326.00	2.10	2.09	99	1460	C7A	< 4	< 10	.16	14	35	85	1	<0.05						LIMESTONE - extensively recrystallized
326.00	328.05	2.05	2.05	100	1461	C7A	4	< 10		10	35	48	2	<0.05						LIMESTONE
328.05	328.75	.70	.70	100	1430		< 1	50		80	10	150	< 3	<0.01						BASALT
328.75	328.95	.20	.19	95	1462	C8	6	< 10		6	40	60	1	<0.05						LIMESTONE - extensively recrystallized
328.95	329.05	.10	.09	90	1431		< 1	100		80	4	80	< 3	<0.01						BASALT
329.05	331.00	1.95	1.80	92	1463	C8	6	< 10	.20	24	25	120	2	<0.05						LIMESTONE - extensively recrystallized, often sheared and fractured showing secondary
331.00	333.00	2.00	1.98	99	1464	C8	10	10		14	25	75	1	<0.05						LIMESTONE calcite veining with some pyrite.
333.00	334.60	1.60	1.60	100	1465	C8	8	< 10		24	25	100	10	<0.05						LIMESTONE - as above
334.60	336.50	1.90	1.90	100	1466	C9	4	< 10	.08	16	25	75	2	0.05						LIMESTONE - as above
336.50	338.45	1.95	1.95	100	1467	C9	4	< 10		12	15	38	< 1	0.05						LIMESTONE - as above
338.45	340.50	2.05	2.05	100	1468	C10	< 4	< 10		150	20	40	1	<0.05						LIMESTONE - as above
340.50	342.60	2.10	2.10	100	1469	C10	< 4	15	.08	18	15	30	3	<0.05						LIMESTONE - as above
342.60	344.69	2.09	2.09	100	1470	C10	< 4	< 10		14	10	20	1	<0.05						LIMESTONE - as above
344.69	346.37	1.68	1.68	100	1471	C11	< 4	< 10	.08	10	5	6	1	<0.05						LIMESTONE - as above
346.37	346.80	.43	.43	100	1472	C12	< 4	10	.20	20	200	150	< 1	<0.05						SILTY MARL
346.80	348.00	1.20	1.20	100	1473	C13	10	< 10	.04	14	15	38	1	<0.05						LIMESTONE - extensively recrystallized and brecciated.
348.00	349.60	1.60	1.60	100	1474	C14	< 4	< 10	.08	8	20	32	1	<0.05						LIMESTONE - extensively recrystallized and brecciated.

[redacted] DIAMOND DRILL [redacted]

054

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays								Weighted Assay	
							Ag	As	Ni	Cr	Mn	Ti	Bi	Ba		
319.50	321.50	2.00	1.98	99	1458	C7	< 1	< 20	< 5	20	300	800	< 10	< 200		
321.50	323.25	1.75	1.73	99	1459	C7	< 1	< 20	15	20	300	800	< 10	< 200		
323.25	323.90	.65	.64	99	1429		< .1	< 50	200	200	1500	> 1%	< 1	400		
323.90	326.00	2.10	2.09	99	1460	C7A	< 1	< 20	20	20	100	1500	40	< 200		
326.00	328.05	2.05	2.05	100	1461	C7A	< 1	< 20	10	20	100	1500	20	< 200		
328.05	328.75	.70	.70	100	1430		< .1	< 50	200	200	800	> 1%	< 1	600		
328.75	328.95	.20	.19	95	1462	C8	< 1	< 20	45	20	700	800	10	200		
328.95	329.05	.10	.09	90	1431		< .1	< 50	200	200	1000	> 1%	< 1	600		
329.05	331.00	1.95	1.80	92	1463	C8	< 1	< 20	15	< 20	700	800	20	< 200		
331.00	333.00	2.00	1.98	99	1464	C8	< 1	< 20	15	< 20	700	800	< 10	< 200		
333.00	334.60	1.60	1.60	100	1465	C8	< 1	80	30	< 20	700	800	10	< 200		
334.60	336.50	1.90	1.90	100	1466	C9	< 1	30	25	< 20	150	400	10	< 200		
336.50	338.45	1.95	1.95	100	1467	C9	< 1	< 20	25	< 20	150	400	10	< 200		
338.45	340.50	2.05	2.05	100	1468	C10	< 1	< 20	20	< 20	60	400	20	< 200		
340.50	342.60	2.10	2.10	100	1469	C10	< 1	< 20	15	< 20	60	400	20	< 200		
342.60	344.69	2.09	2.09	100	1470	C10	< 1	< 20	10	< 20	80	400	20	< 200		
344.69	346.37	1.68	1.68	100	1471	C11	< 1	< 20	< 5	< 20	60	400	10	< 200		
346.37	346.80	.43	.43	100	1472	C12	< 1	< 20	90	< 20	300	1000	10	< 200		
346.80	348.00	1.20	1.20	100	1473	C13	< 1	< 20	20	< 20	60	200	10	< 200		
348.00	349.60	1.60	1.60	100	1474	C14	< 1	< 20	5	< 20	150	200	10	< 200		

344055

The Shell Company of Australia Limited
METALS DIVISION

055

344056

DRILL LOG SHEET

Hole No : RD 5

PROJECT : REDWATER

LOCATION CODE : MQ 04

COLLAR CO-ORDINATES : 6100mN/10620mE

COLLAR R.L. : 430m (approx.)

LOCATION :

MAP/PHOTO REFERENCE :

DATE STARTED	16-2-81	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	
DATE FINISHED	21-3-81	NON CORE					Nº OF TRAYS	26
TOTAL DEPTH	203.6m						SAMPLE STORAGE	
LOGGED BY	L.D. Banwell	CORE					ASSAY LAB.	Amdel
CONTRACTOR	A.D.D.	NQ		0	88m	88m	ASSAY REPORTS	
RIG	Mindrill F30	BQ		88m	203.6m	115.6m		
DRILL CREW	M. Blight	CASING					MIN. & PET. LAB.	
	D. Short						MIN. & PET. REPORTS	
		CASING LEFT	PVC piping	0	88m	88m		

HOLE SURVEY DATA

INSTRUMENT :

DEPTH	INSTRUMENT INCL.	INSTRUMENT AZ.	ACID ETCH INCL.	ACID ETCH AZ.	REMARKS
COLLAR	60°	260°			
90m	59°	261°			
140m	59°	–			
198m	58°	283°			

GRAPHIC/LETTER SYMBOL LOGGING KEY

STRUCTURE / ALTERATION CODE

- B BEDDING
- J JOINTING
- C CLEAVAGE
- F FOLIATION
- sh SHEARING
- q QUARTZ VEINS
- O OXIDATION

DRILLING SUMMARY :

PROJECT: REDWATER

DRILL LOG - SAMPLING RECO

HOLE NO: RD 056

344057

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays Sn	W	CaF_2	Cu	Pb	Zn	Mo	Au	Weighted Assays/Ratios	% Estimates	Core Angles	Alt	T.S P.S	Description
0.00	21.89	21.89	8.58	39																BASALT SOIL - extensively weathered.
21.89	22.84	.95	.95	100																TERTIARY BASALT
22.84	28.21	5.37	5.37	100																TERTIARY BASALT - very weathered
28.21	51.10	22.89	22.89	100																TERTIARY BASALT - with small vugs and veins of zeolites.
51.10	53.80	1.70	1.70	100																PALAEOSOIL - very poorly developed
53.80	54.90	1.10	.82	75																TERTIARY BASALT
54.90	69.50	14.60	5.80	40																TERTIARY DEEP LEAD DEPOSITS - fine clayey material to conglomerate
69.50	74.00	4.50	2.51	56																SAND - unconsolidated
74.00	80.80	6.80	5.02	74																PALAEOSOIL - clayey.
80.80	90.00	9.20	9.20	100	1479		<1	<50		3	6	<20	<3	<.01						LIMESTONE - recrystallized, occassional clayey cave fill & skarnified bands (garnets prese
90.00	100.00	10.00	9.51	95	1480		<1	<50		1	6	40	<3	<.01						LIMESTONE - as above
100.00	110.00	10.00	9.28	93	1481		<1	<50		3	6	<20	<3	<.01						LIMESTONE - as above
110.00	120.00	10.00	8.45	85	1482		<1	<50		1	10	<20	<3	<.01						LIMESTONE - as above
120.00	130.00	10.00	9.97	100	1483		<1	<50		1	20	40	<3	<.01						LIMESTONE - as above
130.00	140.00	10.00	8.62	86	1484		<1	<50		1	10	<20	<3	<.01						LIMESTONE - as above
140.00	150.00	10.00	9.05	90	1485		<1	<50		<1	20	20	<3	<.01						LIMESTONE - as above
150.00	153.00	3.00	2.56	85	1486		<1	<50		2	20	40	<3	<.01						LIMESTONE - as above
153.00	154.20	1.20	1.20	100	2036	C8	6	<10	0.62	34	65	480	<1	0.05						SKARN - very weathered
154.20	159.82	5.62	5.62	100	1686		<1	<50		2	20	40	<3	<.01						LIMESTONE - recrystallized
159.82	160.80	.98	.98	100	1494		22	15		48	50	290	1							SKARN - extensively weathered & sheared, clay minerals dominate
160.80	161.20	.40	.40	100	1495	C1	50	20	0.46	55	50	260	2	0.06						SKARN - as above
161.20	161.80	.60	.54	90	1496		26	25		55	60	400	2							SKARN - as above
161.80	162.30	.50	.50	100	1497		10	30		38	40	330	2							SKARN - as above
162.30	162.96	.66	.66	100	1498	C2	150	15	0.24	44	45	450	3	0.06						SKARN - with narrow bands (up to 10cm) & small clumps of massive magnetite
162.96	164.03	1.07	1.07	100	1499	C3	320	25	0.12	42	20	250	7	0.06						MAGNETITE SKARN - coarse grained, weathered
164.03	164.85	.82	.81	99	1500	C4	34	20	0.42	44	35	250	2	0.04						SKARN - minor magnetite
164.85	165.85	1.00	.73	73	2001		60	15		46	35	270	1							GARNET - DIOPSIDE SKARN - ext. weathered, relic textures preserved, bands of magnetite
165.85	166.90	1.05	.77	73	2002	C5	310	<10	0.36	40	20	170	<1	0.06						GARNET - DIOPSIDE SKARN
166.90	167.40	.50	.36	73	2003		60	10		140	45	390	2							GARNET - DIOPSIDE SKARN
167.40	167.80	.40	.29	73	2004		80	30		170	25	420	1							GARNET - DIOPSIDE
167.80	168.20	.40	.38	95	2005	C6	450	50	0.08	240	70	220	12	0.23						MAGNETITE SKARN - weathered
168.20	169.23	1.03	.98	95	1487		10	150		40	10	190	<3	<.01						GRANITE - extensively weathered mainly clay minerals present.
169.23	169.48	.25	.24	95	1488		<1	<50		10	3	<20	<3	<.01						GRANITE - as above
169.48	176.14	6.66	6.66	100	1489		<1	<50		10	3	<20	<3	<.01						GRANITE - pink, quartz-orthoclase-biotite-plagioclase
176.14	182.80	6.66	6.66	100	1490		<1	10		15	6	<20	<3	<.01						GRANITE - as above
182.80	183.81	1.01	1.01	100	2006	C7	110	60	0.12	12	20	210	2	0.05						GREISEN - green, quartz-feldspar-chlorite-muscovite-biotite
183.81	186.28	2.47	2.47	100	1491		<1	<50		10	6	<20	<3	<.01						GRANITE - pink, quartz-orthoclase-biotite-plagioclase
5.28	191.66	5.38	5.09	95	1492		<1	<50		<1	6	<20	18	<.01						FAULT ZONE - altered granite: chlorite-quartz-feldspar
191.66	203.60	11.94	11.81	98	1493		<1	100		30	10	<20	<3	<.01						GRANITE - light grey to pink quartz-orthoclase-biotite-plagioclase

PROJECT: [redacted]ATER[redacted] DIAMOND DRILL LOG -

057

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Composite No.	Assays								Weighted Assays/Ratios		
							Ag	As	Ba	Cr	Mn	Ti	Bi	Fe%			
0.00	21.89	21.89	8.58	39													
21.89	22.84	.95	.95	100													
22.84	28.21	5.37	5.37	100													
28.21	51.10	22.89	22.89	100													
51.10	53.80	1.70	1.70	100													
53.80	54.90	1.10	.82	75													
54.90	69.50	14.60	5.80	40													
69.50	74.00	4.50	2.51	56													
74.00	80.80	6.80	5.02	74													
80.80	90.00	9.20	9.20	100	1479		.4	<50	<200	20	200	400	<1				
90.00	100.00	10.00	9.51	95	1480		.8	<50	<200	20	200	600	<1				
100.00	110.00	10.00	9.29	93	1481		.2	<50	<200	<20	200	300	<1				
110.00	120.00	10.00	8.45	85	1482		.1	<50	<200	20	200	300	<1				
120.00	130.00	10.00	9.97	100	1483		.2	<50	<200	40	300	400	<1				
130.00	140.00	10.00	8.62	86	1484		.1	<50	<200	<20	250	300	<1				
140.00	150.00	10.00	9.05	90	1485		.1	<50	<200	<20	200	300	<1				
150.00	153.00	3.00	2.56	85	1486		.1	<50	<200	<20	600	400	<1				
153.00	154.20	1.20	1.20	100	2036	C8	<1	<20	<200	60	2500	3000	<10	3.10			
154.20	159.82	5.62	5.62	100	1488		.1	<50	<200	<20	600	400	<1				
159.82	160.80	.98	.98	100	1494		1	110					10	2.50			
160.80	161.20	.40	.40	100	1495	C1	<1	330	200	60	500	6000	30	5.10			
161.20	161.80	.60	.56	90	1496		1	220					10	4.30			
161.80	162.30	.50	.50	100	1497		<1	70					10	3.20			
162.30	162.96	.66	.66	100	1498	C2	1	140	<200	60	700	4000	60	9.90			
162.96	164.03	1.07	1.07	100	1499	C3	1	<20	<200	20	10000	1000	120	34.4			
164.03	164.85	.82	.81	99	1500	C4	1	150	600	80	300	6000	40	5.30			
164.85	165.85	1.00	.73	73	2001		1	140					40	5.00			
165.85	166.90	1.05	.77	73	2002	C5	1	<20	<200	20	1500	3000	20	5.10			
166.90	167.40	.50	.36	73	2003		1	180					30	6.30			
167.40	167.80	.40	.29	73	2004		1	50					80	11.0			
167.80	168.20	.40	.38	95	2005	C6	1	210	<200	20	4000	800	280	31.6			
168.20	169.23	1.03	.98	95	1487		<1	<50	<200	<20	600	1000	6				
169.23	169.48	.25	.24	95	1488		<1	<50	400	<20	150	1000	<1				
169.48	176.14	6.66	6.66	100	1489		2	<20	<200	<20	100	1500	<1				
176.14	182.80	6.66	6.66	100	1490		1	<60	<200	<20	80	1500	<1				
182.80	183.81	1.01	1.01	100	2006	C7	1	<20	<200	20	2800	2000	<10	10.4			
183.81	186.28	2.47	2.47	100	1491		<1	<50	400	<20	80	1500	<1				
186.28	191.66	5.38	5.09	95	1492		1	<50	<200	<20	250	2000	<1				
191.66	203.60	11.94	11.83	99	1493		1	<50	200	<20	100	1500	<1				

344058

058

SHELL COMPANY OF AUSTRALIA LTD. 344059

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

PAGE ..1.. OF ..3.. PAGES

AREA [ ][ ][ ][

059

SHELL COMPANY OF AUSTRALIA LTD. 344060

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

AREA [ ][ ][ ][

SHELL COMPANY OF AUSTRALIA LTD. 344061

Magnetic Susceptibility Measurements

REC. TYPE (1 2)

PAGE 3 OF 3 PAGES

AREA (3–26): REDWATER

DATE (Y Y M M D D) (27–32): 81.01.28

DRILL HOLE Nº (33–40): RED 1

COLLAR COORDS (41–47): 64135 N (48) 109120 E (49–55, 56)

INSTRUMENT (57–61): JH8

RECORDED BY (62–65): CB

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(①×②×③) CORRECTED READING K	GEOLOGY (ANALOGUE)
126		537.0			10	limestone.
128	30				63	
130	16				32	
132	15				32	
134	10				21	
136	10				21	
138	5				10	
140	60				126	
142	15000				3150	
144	5500				1155	
146	700				1470	Granite E.O.H.

1 2 6 7 11 12 18 19 21 22 26

SIZE CORRECTION : (MULTIPLY READING)

METER NO | SM-5 ×1·6 | JH-8 ×1·6

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-8 METERS

061

SHELL COMPANY OF AUSTRALIA LTD.

344062

Magnetic Susceptibility Measurements

REC. TYPE (1 2)

AREA (3–26): REDWATER

DATE (27–32): Y Y M M D D — 8 1 0 1 2 8

DRILL HOLE Nº (33–40): RED 2

COLLAR COORDS (41–47): 6507 N (48) — (49–55): 10997 E (56)

INSTRUMENT (57–61): JH 8

RECORDED BY (62–65): CB

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(①×②×③) CORRECTED READING K	GEOLOGY (ANALOGUE)
1	50000	47.6			90000	soil
2	65000			1	117000	greybilly
3	70000			1	126000	
4	80000			1	144000	
5	60000			1	108000	
6	50000				90000	clayey sand
7	20000				36000	
8	7000				12600	
9	45				81	
10	2000				3600	split core
11	6000				10800	
12	7000				12600	
13	30				54	
14	40				72	
15	10				18	cover fill
16	20				36	
17	15				27	split core
18	15				27	
19	10				18	
20	30				54	limestone
22	20				36	alternating
24	15				27	wriggite & cover
26	60000			1	108000	fill.
28	30000				54000	split core
30	40000				72000	
32	80000			1	144000	rubble
34	100000			1	180000	
36	100000			1	180000	split core
38	100000			1	180000	
40	40				72	Cale-silicate skarn.
42	60	37.0			1260	
44	5				10	Granite
46	5				10	
48	5				10	
50	10				21	
52	350				7350	

High core loss

1 2 — 6 7 — 11 12 — 18 19 — 21 22 — 26

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-5	JH-8
HQ	x 1·5	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-8 METERS.

062

SHELL COMPANY OF AUSTRALIA LTD.

344063

Magnetic Susceptibility Measurements

REC. TYPE (1 2)

PAGE 2 OF 2 PAGES

AREA (3–26): REDWATER

DATE (27–32): YY MM DD = 81.01.28

DRILL HOLE N° (33–40): RED 2

COLLAR COORDS: 6507 (41–47) N (48) 10997 (49–55) E (56)

INSTRUMENT (57–61): JH 6

RECORDED BY (62–65): CB

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(①×②×③) CORRECTED READING K	GEOLOGY (ANALOGUE)
54	400	37.0			840	granite
56	500				1050	
58	700				1470	
						E.O.H.

1 2 6 7 11 12 18 19 21 22 26

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-5	JH-6
NO	x 1·5	x 1·8
90	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-6 METERS.

063

SHELL COMPANY OF AUSTRALIA LTD.

344064

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

AREA [ ][ ][ ][

064

SHELL COMPANY OF AUSTRALIA LTD.

344065

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

PAGE 2 OF 2 PAGES

AREA [ ][ ][ ][

065

SHELL COMPANY OF AUSTRALIA LTD.

344066

Magnetic Susceptibility Measurements

REC. TYPE (1–2)

AREA (3–26): REDWATER

DATE (27–32): Y Y M M D D — 81.01.21

DRILL HOLE Nº (33–40): RD4

COLLAR COORDS (41–55): 6100 N (48) 10500 E (56)

INSTRUMENT (57–61): JH8

RECORDED BY (62–65): CB

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(①×②×③) CORRECTED READING K	GEOLOGY (ANALOGUE)
3	300	47.6			540	Basalt
4	300				540	
5	300				540	
6	300				540	
7	200				360	
8	250				450	
9	250				450	
10	250				450	
11	200				360	
12	5				9	
13	550				990	
14	15				27	
15	200				360	rubble
16	200				360	
17	2000				3600	
18	600				1080	
19	650				1170	
20	2000				3600	
22	1500				2700	
24	2500				4500	
26	6000				10800	
28	1500				2700	
30	800				1400	
32	1500				2700	
34	800				1400	
36	800				1400	
38	700				1260	
40	600				1080	
42	650				1170	
44	650				1170	
46	450				810	
48	650				1170	
50	900				1620	
52	800				1440	
54	800				1440	
56	1500				2700	

SIZE CORRECTION (MULTIPLY READING):

METER	SM-5	JH-8
NQ	x 1·5	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION: NOT NECESSARY FOR SM-5 OR JH-8 METERS.

066

SHELL COMPANY OF AUSTRALIA LTD.

344067

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

AREA [ ] (3 … 26) — R E O W A F E R

DATE [Y Y M M D D] (27 … 32)

DRILL HOLE Nº [ ][ ][ ][ ][ ][ ][ ][ ] (33 … 40) — R D 4

COLLAR COORDS [ ][ ][ ][ ][ ][ ][ ] (41 … 47) — 6 1 0 0

N [ ] (48) — N

[ ][ ][ ][ ][ ][ ][ ] (49 … 55) — 1 0 5 0 0 0

E [ ] (56) — E

INSTRUMENT [ ][ ][ ][ ][ ] (57 … 61) — J H 8

RECORDED BY [ ][ ][ ][ ] (62 … 65) — C R

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(①×②×③) CORRECTED READING K	GEOLOGY (ANALOGUE)
58	10000	47.6			1800	Basalt
60	20000				3600	
62	25000				4500	
64	15000				2700	
66	5				9	sandstone &
68	5				9	conglomerate.
70	0				0	
72	5				9	
74	5				9	
76	5				9	
78	10				18	
80	5				9	
82	10				18	Limestone.
84	15				27	
86	5				9	
88	5				9	
90	5				9	
92	20				36	
94	35	37.0			74	
96	10				21	
98	10				21	
100	5				10	
102	5				10	
104	15				32	
106	5				10	
108	5				10	
110	5				10	
112	5				10	
114	5				10	
116	5				10	
118	20				42	
120	10				21	
122	5				10	
124	5				10	
126	5				10	
128	5				10	

core loss

core loss/rubble

core loss

rubble.

(1 2 … 6 7 … 11 12 … 18 19 … 21 22 … 26)

SIZE CORRECTION (MULTIPLY READING)

METER	SM-6	JH-6
NQ	x 1·5	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-6 OR JH-6 METERS.

067

SHELL COMPANY OF AUSTRALIA LTD.

344068

Magnetic Susceptibility Measurements

REC. TYPE (1 2)

AREA (3 – 26): REDWATER

DATE (YYMMDD) (27 – 32): 810120

DRILL HOLE N° (33 – 40): RD4

COLLAR COORDS (41 – 47): 6100 N (48) 10500 E (56)

INSTRUMENT (57 – 61): JH8

RECORDED BY (62 – 65): CB

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(① × ② × ③) CORRECTED READING K	GEOLOGY (ANALOGUE)
130	35	37.0			74	Limestone
132	15				32	
134	10				21	
136	5				10	
138	5				10	
140	10				21	
142	25				52	
144	10				21	
146	20				42	
148	20				42	
150	15				32	
152	5				10	
154	50				105	
156	50				105	
158	10				21	
160	80				63	
162	40				84	
164	45				94	
166	40				84	
168	5				10	
170	5				10	
172	45				94	
174	6				10	
176	5				10	
178	0				0	
180	25				52	
182	25				52	
184	25				52	
186	15				32	
188	30				63	
190	5				10	
192	10				21	
194	10				21	
196	30				63	
198	20				42	
200	15				32	

High case loss.

(1 2 | 6 7 | 11 12 | 18 19 | 21 22 | 26)

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-6	JH-8
NQ	x 1·5	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-6 OR JH-8 METERS.

068

SHELL COMPANY OF AUSTRALIA LTD.

344069

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

AREA [ ][ ][ ][

069

SHELL COMPANY OF AUSTRALIA LTD.

344070

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

AREA [ ][ ][ ][

070

SHELL COMPANY OF AUSTRALIA LTD.

344071

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

AREA [ ] (3 – 26)

DATE (Y Y M M D D) [8][1.][0][2][1][6] (27 – 32)

DRILL HOLE N° [ ][ ][ ][ ][ ][R][D][4] (33 – 40)

COLLAR COORDS [ ][ ][ ][6][1][0][0] (41 – 47) N [N] (48)

[ ][ ][1][0][5][0][0] (49 – 55) E [E] (56)

INSTRUMENT [ ][ ][J][H][8] (57 – 61)

RECORDED BY [ ][ ][C][B] (62 – 65)

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(① × ② × ③) CORRECTED READING K	GEOLOGY (ANALOGUE)
346	20	37.0			42	limestone
348	20	↓			42	limestone
						E.O.H.

(1 2 — 6 7 — 11 12 — 18 19 — 21 22 — 26)

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-5	JH-8
NQ	x 1·6	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-8 METERS.

071

SHELL COMPANY OF AUSTRALIA LTD.

344072

Magnetic Susceptibility Measurements

REC. TYPE (1 2)

AREA (3 – 26): REDWATER

DATE (27 – 32): YY MM DD — 81.03.23

DRILL HOLE N° (33 – 40): RD5

COLLAR COORDS (41 – 47): 6100 (48) N; 10620 (49 – 55) (56) E

INSTRUMENT (57 – 61): JH8

RECORDED BY (62 – 65): ADM

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(① × ② × ③) CORRECTED READING K	GEOLOGY (ANALOGUE)
1		47.6				
2						
3						
4	200				360	Basalt
5	40				72	
6	300				540	
7	200				360	
8	200				360	
9	80				144	
10	320				576	
11	180				324	
12	80				144	
13	320				576	
14	950				1710	
15	300				540	
16	150				270	
17	350				630	
18	1500				2700	
19	950				1710	
20	500				900	
22	2500				4500	
24	900				1620	
26	2000				3600	
28	2000				3600	
80	1500				2700	
32	950				1710	
34	900				1620	
36	850				1530	
38	600				1080	
40	650				1170	
42	900				1620	
44	1050				1890	
46	1500				2700	
48	1500				2700	
50	6000				10800	
52	2500				4500	

1 2 — 6 7 — 11 12 — 18 19 — 21 22 — 26

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-6	JH-6
NQ	x 1·5	x 1·8
BQ	x 1·8	x 2·1
	2·0	x 2·7

DENSITY CORRECTION : NOT NECESSARY FOR SM-6 OR JH-6 METERS.

072

SHELL COMPANY OF AUSTRALIA LTD.

344073

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

AREA [ ][ ][ ][

073

SHELL COMPANY OF AUSTRALIA LTD.

344074

Magnetic Susceptibility Measurements

REC. TYPE [ ][ ] (1 2)

PAGE 3 OF 4 PAGES

AREA [ ] (3 – 26) REDWATER

DATE [Y Y][M M][D D] [8 1][0 3][2 3] (27 – 32)

DRILL HOLE Nº [ ][ ][ ][ ][ ][RD 5] (33 – 40)

COLLAR COORDS [ ][ ][ ][6 1 0 0] (41 – 47) [N] (48) N

[ ][1 0 6 2 0] (49 – 55) [E] (56) E

INSTRUMENT [ ][ ][JH 8] (57 – 61)

RECORDED BY [ ][AD M] (62 – 65)

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(① × ② × ③) CORRECTED READING K	GEOLOGY (ANALOGUE)
124	60	37.0			126	Limestone
126	20				42	
128	35				74	
130	30				63	
132	20				42	
134	20				42	
136	0				0	
138	5				10	
140	20				45	
142	5				10	
144	65				136	
146	10				21	
148	100				210	
150	10				21	
152	60				126	
154	25				53	
156	30				63	
158	35				74	
159	20				42	
160	15				32	skarn
161	25				53	skarn
162	15				32	skarn
163	2500				52500	Magnetite skarn
164	6000				126000	Magnetite skarn
165	25				53	skarn
166	150				315	skarn
167	40				84	skarn
168	2500				52500	magnetite skarn
169	500				10500	skarn
170	5				10	granite
172	5				10	
174	5				10	
176	5				10	
178	10				21	
180	6				10	
182	5				10	

(1 2 – 6 7 – 11 12 – 18 19 – 21 22 – 26)

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-5	JH-5
NQ	x 1·5	x 1·8
BQ	x 1·8	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-5 METERS.

074

SHELL COMPANY OF AUSTRALIA LTD.

Magnetic Susceptibility Measurements

344075

REC. TYPE [ ][ ] (1 2)

PAGE 4 OF 4 PAGES

AREA [ ] (3) REOMAFER (26)

DATE (Y Y M M D D) 81.03.23 (27 32)

DRILL HOLE N° [ ][ ][ ][ ][ ]RD5 (33 40)

COLLAR COORDS [ ][ ][ ]6100 (41 47) N (48) [ ][ ]10620 (49 55) E (56)

INSTRUMENT [ ][ ]JH8 (57 61)

RECORDED BY [ ]ADM (62 65)

DEPTH (METRES)	① READING 10^{-6} cgs	CORE DIAM mm.	② CORE SIZE CORR. FACT.	③ DENSITY CORR.	(① × ② × ③) CORRECTED READING K	GEOLOGY (ANALOGUE)
182	5	37.0			10	Granite
183	300				620	Greisen
184	5				10	Granite
186	10				21	Granite
188	5				10	Fault zone
190	15				32	fault zone
192	5				10	granite
194	10				21	
196	5				10	
198	0				0	
200	10				21	
202	5				10	
						E.O.H.

1 2 6 7 11 12 18 19 21 22 26

SIZE CORRECTION : (MULTIPLY READING)

METER	SM-5	JH-6
NQ	x 1·5	x 1·6
BQ	x 1·9	x 2·1

DENSITY CORRECTION : NOT NECESSARY FOR SM-5 OR JH-6 METERS.

PROJECT : Laurel Creek West SCALE : NO [redacted]

344076

025

From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample NO	Comp NO	Assays Sn ppm	W ppm	Cu ppm	Pb ppm	Zn ppm	Au ppm	Magnetic Susceptibility	% Estimates	Core Angles	All.	T.S. P.S.	Description
0	2				5801		12	20	14	28	32	.10	10					Clayey soil
2	4				5802		12	55	20	40	80	<.05	10					Clayey soil - with some rock fragments limestone skarn (?).
4	6				5803		10	85	16	32	90	<.05	20					Clayey soil - " " " " " "
6	8				5804		6	20	26	55	350	<.05	10					Clayey soil - " " " " " "
8	10				5805		<4	25	30	38	670	<.05	15					Clayey soil - " " " " " "
10	12				5806		<4	20	26	26	1020	<.05	20					Limestone - with some skarn (epidote + chlorite) and secondary calcite
12	14				5807		<4	35	8	12	270	<.05	20					Limestone - " " " " " " " "
14	16				5808		6	20	16	20	540	<.05	30					Limestone - " " " " " " " "
16	18				5809		<4	20	16	20	550	<.05	25					Limestone - " " " " " " " "
18	20				5810		4	25	14	22	410	<.05	20					Limestone - " " " " " " " "
20	22				5811		<4	25	10	20	300	<.05	10					Limestone - " " " " " " " "
22	24				5812		<4	<10	6	16	230	<.05	20					Limestone - " " " " " " " "
24	26				5813		<4	10	12	18	195	<.05	20					Limestone - " " " " " " " "
26	28				5814		<4	10	8	16	120	<.05	35					Limestone - " " " " " " " "
28	30				5815		<4	15	6	24	115	<.05	10					Limestone - " " " " " " " "
30	32				5816		<4	<10	2	26	65	<.05	10					Limestone
32	34				5817		<4	<10	4	36	70	<.05	10					Limestone
34	36				5818		<4	10	6	24	125	<.05	15					Limestone
36	38				5819		<4	<10	4	22	90	<.05	5					Limestone
38	40				5820		4	<10	4	20	115	<.05	10					Limestone
40	42				5821		4	<10	6	22	100	<.05	6000					Limestone - with some diopside (?) skarn
42	44				5822		6	<10	4	16	105	<.05	1500					Limestone - " " "
44	46				5823		<4	<10	55	350	290	<.05	3000					Limestone - with magnetite & calc-silicate skarn
46	48				5824		34	10	20	120	490	<.05	20000					Limestone - " " " " " "
48	50				5825		770	25	75	20	380	<.05	65000					Magnetite skarn - with minor limestone & calc-silicates
50	52				5826		180	<10	18	16	195	<.05	100000					Magnetite skarn.
52	54				5827		100	<10	12	8	150	<.05	90000					Magnetite skarn.
54	56				5828		310	15	10	10	100	<.05	60000					Magnetite skarn.
56	58				5829		170	25	6	14	130	<.05	6000					Transition from magnetite skarn to granite
58	60				5830		10	10	2	10	40	<.05	4500					Granite
60	62				5831		12	10	6	14	175	<.05	400					Granite
62	64				5832		6	<10	4	12	70	<.05	250					Granite
64	66				5833		6	20	10	20	380	<.05	80					Granite
66	68				5834		6	60	8	22	240	<.05	250					Granite
68	70				5835		4	10	4	14	105	<.05	150					Granite
70	72				5836								85					Granite
72	74				5837								50					Granite
74	76				5838	5861	8	15	6	16	170	<.05	75					Granite
76	78				5839								80					Granite
78	80				5840								200					Granite
80	82				5841								60					Granite
82	84				5842								100					Granite
84	86				5843	5862	14	15	6	20	200	<.05	250					Granite
86	88				5844								200					Granite
88	90				5845								200					Granite
90	92				5846								200					Granite
92	94				5847								150					Granite
94	96				5848	5863	8	10	6	20	155	<.05	150					Granite
96	98				5849								75					Granite
													75					Granite

SHEET 1 OF 2 SHEETS

PROJECT : Laurel Creek West

076

From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample No	Comp No	Assays						Weighted Assays/Ratios			
							Fe %	Bi ppm	As ppm	Ag ppm	Mo ppm	Ni ppm				
0	2				5801		2.20	<4	10	1	4	24				
2	4				5802		11.5	<4	48	<1	<4	32				
4	6				5803		22.5	<4	90	<1	<4	55				
6	8				5804		6.50	<4	18	<1	<4	85				
8	10				5805		7.80	<4	18	1	<4	175				
10	12				5806		4.85	<4	16	1	4	330				
12	14				5807		2.65	<4	16	2	4	150				
14	16				5808		2.70	<4	12	1	4	190				
16	18				5809		2.60	<4	10	1	4	170				
18	20				5810		2.50	<4	9	1	<4	110				
20	22				5811		1.30	<4	10	1	<4	70				
22	24				5812		1.00	<4	5	<1	<4	32				
24	26				5813		2.00	<4	6	<1	<4	48				
26	28				5814		1.30	<4	3	<1	4	32				
28	30				5815		0.90	<4	2	1	<4	28				
30	32				5816		0.50	<4	2	<1	<4	16				
32	34				5817		0.45	<4	2	1	<4	16				
34	36				5818		1.00	<4	5	2	<4	36				
36	38				5819		0.80	<4	3	1	<4	28				
38	40				5820		0.65	<4	2	1	<4	32				
40	42				5821		1.55	8	6	2	<4	20				
42	44				5822		1.00	12	4	<1	<4	28				
44	46				5823		1.80	<4	6	2	<4	24				
46	48				5824		5.55	<4	12	2	<4	20				
48	50				5825		19.5	32	80	<1	<4	28				
50	52				5826		21.0	24	300	<1	4	16				
52	54				5827		26.5	8	360	<1	4	16				
54	56				5828		18.0	12	90	<1	<4	12				
56	58				5829		3.80	<4	30	<1	<4	32				
58	60				5830		1.05	<4	12	1	16	8				
60	62				5831		1.65	<4	14	<1	150	44				
62	64				5832		1.00	<4	8	<1	36	16				
64	66				5833		2.50	8	12	1	4	105				
66	68				5834		2.20	<4	8	<1	4	50				
68	70				5835		1.15	<4	14	<1	8	20				
70	72				5836											
72	74				5837											
74	76				5838	5861	1.10	<4	10	<1	12	40				
76	78				5839											
78	80				5840											
80	82				5841											
82	84				5842											
84	86				5843	5862	2.10	<4	12	<1	75	48				
86	88				5844											
88	90				5845											
90	92				5846											
92	94				5847											
94	96				5848	5863	1.80	<4	10	<1	14	36				
96	98				5849											

340727

PROJECT : Laurel Creek West SCALE : HOLE N[redacted]01

From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample No	Comp. No	Assays Sn ppm	W ppm	Cu ppm	Pb ppm	Zn ppm	Au ppm	Weighted Assays/Ratios	% Estimates	Core Angles	Alt.	T.S. P.S.	Description 344078
100	102				5851								55					Granite
102	104				5852								95					Granite
104	106				5853	5864	<4	10	4	14	95	<.05	60					Granite
106	108				5854								70					Granite
108	110				5855								55					Granite
110	112				5856								150					Granite
112	114				5857								65					Granite
114	116				5858	5865	12	<10	4	16	90	<.05	60					Granite
116	118				5859								250					Granite
118	120				5860								200					Granite

SHEET 2 OF 2 SHEETS

PROJECT : Laurel Creek West SCALE :

078

From	To	Inter'l (m)	Core Rec'd	% Recd	Sample No	Comp No	Assays Fe %	Bi ppm	As ppm	Ag ppm	Mo ppm	Ni ppm	Weighted Assays/Ratios
100	102				5851								
102	104				5852								
104	106				5853	5864	0.35	<4	8	<1	8	24	
106	108				5854								
108	110				5855								
110	112				5856								
112	114				5857								
114	116				5858	5865	1.30	<4	8	<1	12	24	
116	118				5859								
118	120				5860								

3440779

079

344080

APPENDIX 2

SOUTHERN LICENCE AREA

REDWATER - LOYETEA TREND

Magnetic Anomalies - Cambrian Volcanics
Loyetea Prospect Details

080

7.3. LOYETEA

344081

7.3.1. General

Loyetea (aeromagnetic anomalies 4142/2 and 4142/11) forms the northern part of the 8 km magnetic belt running from Laurel Creek West, through Redwater to Loyetea. The Loyetea prospect covers a 4 sq. km. area which encompasses two smaller discrete magnetic highs within the larger magnetic anomaly.

Most of the prospect is covered by fairly flat grazing land with some cultivated fields. No work was possible over some of the cultivated fields and this has resulted in 'gaps' in the coverage of the area. The gaps will be filled in when weather and planting time permit.

On both the eastern and western margins of the prospect, the topography becomes very steep and access becomes limited due to very dense vegetation.

7.3.2. Gridding

Gridding at Loyetea covers approximately 4 sq. km. and lines run north-south, with a 200 metre line spacing. The baseline was pegged along 78°M. Station spacing along the lines is 50 metres.

For convenience due to the size of the area involved, the grid was split in half, producing a western and an eastern portion.

7.3.3. Geological Mapping

The prospect at Loyetea is partially covered by Tertiary basalt. The basalt rarely outcrops, but is seen as float or weathered to a deep red soil. In most areas the basalt is thin (less than 2-3 metres), and in many cases hand augering went through weathered basalt cover into the sub-strata.

Apart from the basalt, three other rock types outcrop at Loyetea: Cambrian volcanics, Ordovician conglomerate and Devonian Housetop Granite. Granite outcrops along the western margin of the prospect, intruding a sequence of Cambrian volcanics (mainly crystalline acid to intermediate(?) tuffs). Along the eastern margin of the prospect, Roland conglomerate outcrops form a ridge between the volcanics and a deeply weathered broad limestone valley further to the east at Gunns Plains.

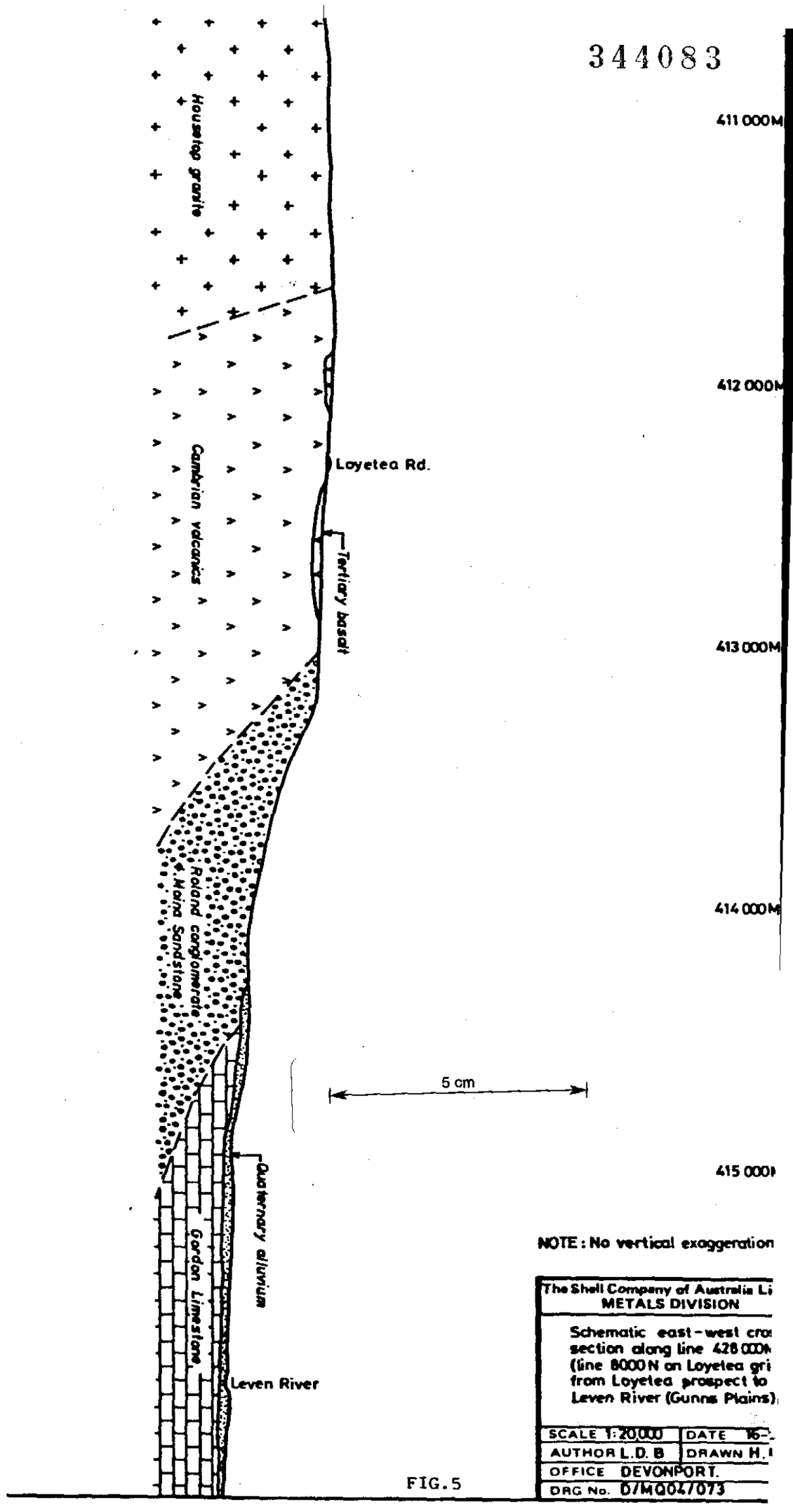
Outcrop in the area is poor, and structural relations are difficult to determine.

To the south Ordovician limestone has been intersected in drill core at Redwater. There the limestone, sandstone and conglomerate are part of a synclinal feature. The presence of Cambrian volcanics to the north at Loyetea may indicate that an anticline, associated with the syncline, has exposed the volcanics in the nose of the anticline and the ridge-forming conglomerates on the eastern limb. This also suggests that the folds in the area have a north easterly trend (approximately parallel to the granite contact). (Refer Fig. 5).

The structure postulated is only speculative, as much of the area concerned is covered by Tertiary basalt, and few outcrops are present where the attitude of the beds can be measured.

082

344083



NOTE: No vertical exaggeration

The Shell Company of Australia Li
METALS DIVISION

Schematic east-west cro
section along line 428 000N
(line 8000 N on Loyetea gri
from Loyetea prospect to
Leven River (Gunns Plains)

SCALE 1:20,000	DATE 16-.
AUTHOR L.D. B	DRAWN H. I
OFFICE DEVONPORT.	
DRG No. D/M0047073	

FIG. 5

7.3.4. Soil Sampling

A soil sampling programme was undertaken along all grid lines at a 50 metre interval. In most cases hand augering broke through the thin Tertiary basalt cover, thus allowing sampling of the sub-strata which was generally Cambrian volcanics. Average soil sample depth was 1.5 metres with the deepest being 4 metres.

386 samples were dry sieved with the -80 mesh portion being sent away for analysis. Analyses included Sn, W, Cu, Pb, Zn, Fe, Mn, Bi, Ni and results are plotted on plans D/MQ04/045, 046, 047, 054, 055, 056.

The soil sampling revealed patchy, low-order Cu-Pb-Zn anomalies over the Cambrian volcanics. These anomalies will be re-sampled to ensure that they are not analytical errors. Sn and W are uniformly low (less than 30ppm) over the whole prospect with the exception of a few patchy higher values over the granite.

7.3.5. Ground Magnetics

A magnetics survey was undertaken at Loyetea to ground locate the airborne anomalies. The survey was done along all grid lines at a 25 metre station spacing. Results are plotted on plans D/MQ04/037, 039, 042, 048.

The two main magnetic peaks within the Loyetea anomaly were successfully ground located. Apart from these, the main feature of the magnetics was the very noisy response. Contouring of the data is almost impossible, therefore the results are presented as stacked profiles. A 3000 to 4000 nT anomaly was picked up on the western part of the prospect near the granite contact. A check of magnetic susceptibilities of the Cambrian volcanics that outcrop over the anomaly gives an average value of $10{,}000 \times 10^{-6}$ cgs units with a range of $2000 - 15000 \times 10^{-6}$ cgs units. Elsewhere on the prospect susceptibilities of the volcanics range from 200 to 3000×10^{-6} cgs units. These high values probably explain the anomalies in this area, however, no modelling of the data has been done to date.

7.3.6. Conclusions

Loyetea is part of the magnetic belt running along the south-eastern edge of the Housetop Granite. This belt contains magnetite skarns at Redwater, and surficially, Loyetea looks promising. However, the geology at Loyetea shows little or no potential for the presence of replacement-type skarns as the interpreted structure demonstrates the absence of limestone.

This of course does not rule out the possibility of Cu-Pb-Zn mineralization in the volcanics, but the geochemistry gives little support for this idea.

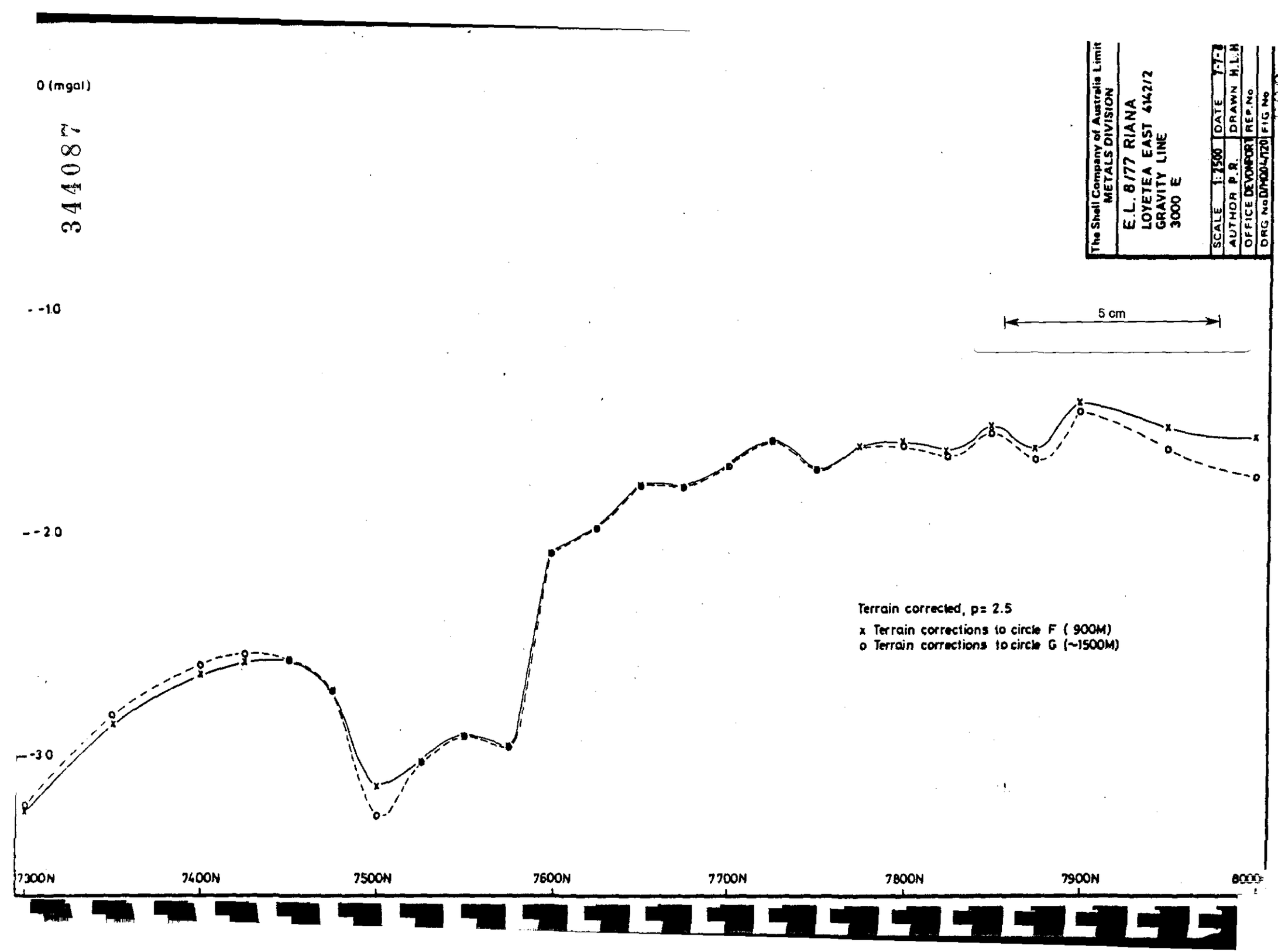
As yet, no full evaluation of the prospect has been made as not all information has been collected. At present, the whole magnetic belt remains a very prospective area with potential for replacement skarns but it would appear that this potential is limited to the areas south of Loyetea, where Gordon limestone occurs near or adjacent to the granite.

2.3 Loyetea (4142/2)

Four additional lines were cut extending the Loyetea Grid to the east and west (lines 1500 E, 1700 E, 2900 E and 3100 E) (Refer Plans D/MQ 04/070 & 071). Ground magnetic readings were taken every 10 m in an attempt to close off the anomalies. Tertiary basalt and Cambrian volcanics were mapped on the grid, the latter with magnetic susceptibilities of 2000 to 15 000 x 10^{-6} cgs units. A short line of gravity was completed over line 3000 E (Refer Fig. 2) but no clear anomaly was detected.

344087

The Shell Company of Australia Limited METALS DIVISION	E.L. 8177 RIANA LOYETEA EAST 4142/2 GRAVITY LINE 3000 E
SCALE 1:2500	DATE 7-7-8
AUTHOR P.R.	DRAWN H.L.H
OFFICE DEVONPORT	REP. No
DRG No D7400/4720	FIG No



087

344088

APPENDIX 3

SOUTHERN LICENCE AREA

REDWATER - LOYETEA TREND

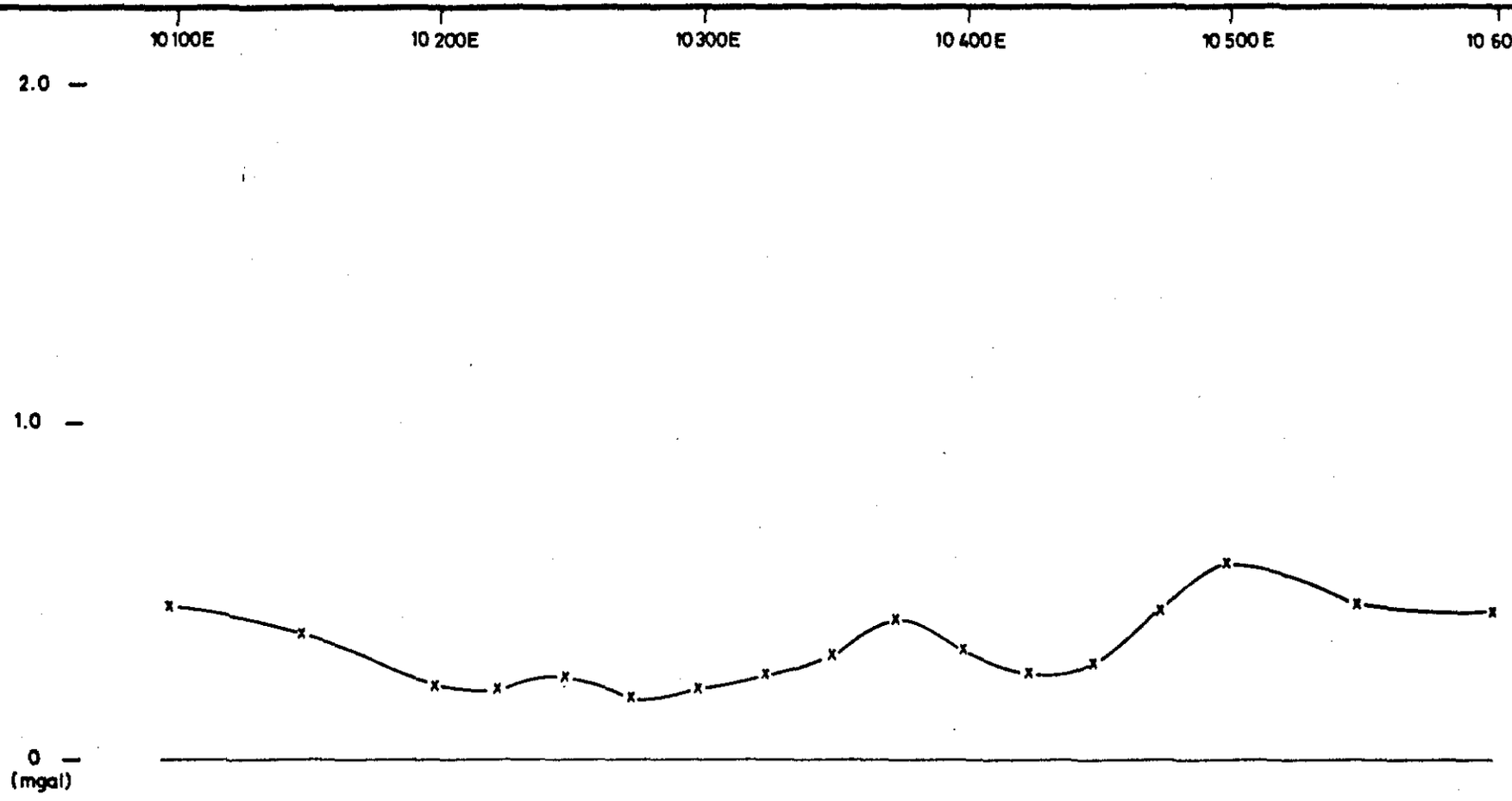
Magnetic Anomalies - Tertiary Basalt-related
Redwater North Prospect
Peak Hill Farm Prospect

2.2 Redwater North (4142/9)

Two reconnaissance lines of ground magnetics and soil sampling over the Redwater North aeromagnetic anomaly were completed. (Refer Plans D/MQ 04/072). Both responses were flat. Grid lines covered Tertiary basalt, Roland conglomerate and sandstone with susceptibilities of 150 to 250 x 10^{-6} cgs units for the basalts and 0 to 10 x 10^{-6} cgs units for the Ordovician sediments.

2.4 Peak Hill Farm (4142/1)

The Peak Hill Farm anomaly is covered by the Redwater Grid. A line of gravity on 5400 N produced no response although the survey line should be extended (Refer Fig. 3) to completely cover the anomaly.



(Terrain corrected, p= 2.5)

x Terrain corrections to circle F (~900M)

5 cm

100 Metres

The Shell Company of Australia Limited
METALS DIVISION

E.L.8/77 RIANA
PEAK HILL FARM
LINE 5400 N
GRAVITY

SCALE 1:2500	DATE 6-7-78
AUTHOR P.R.	DRAWN N.L.M.
OFFICE DEVONPORT	REP.No
DRG No D/MOD/4718	FIG No

34090

030

344091

APPENDIX 4

SOUTHERN LICENCE AREA

Housetop Aeromagnetic Anomaly (4042/2)
Castra Aeromagnetic Anomaly (4142/4)

091

344092

HOUSETOP, RIANA E.L., ANOMALY 4042/2

This aeromagnetic anomaly overlies the eastern side of the Housetop Grantite. One line (00E) of ground magnetics (1km long) recovered the anomaly at 400E with an amplitude of about 3000n T. The source is obviously very shallow and has been attributed to magnetite in the granite. This may imply a somewhat unusual granite phase so geochemical sampling is recommended.

The original name for this anomaly, 4042/2, was Laurel Creek North. In order to avoid future confusion, the above name will be used in future (change on anomaly sheets).

SHELL COMPANY OF AUSTRALIA

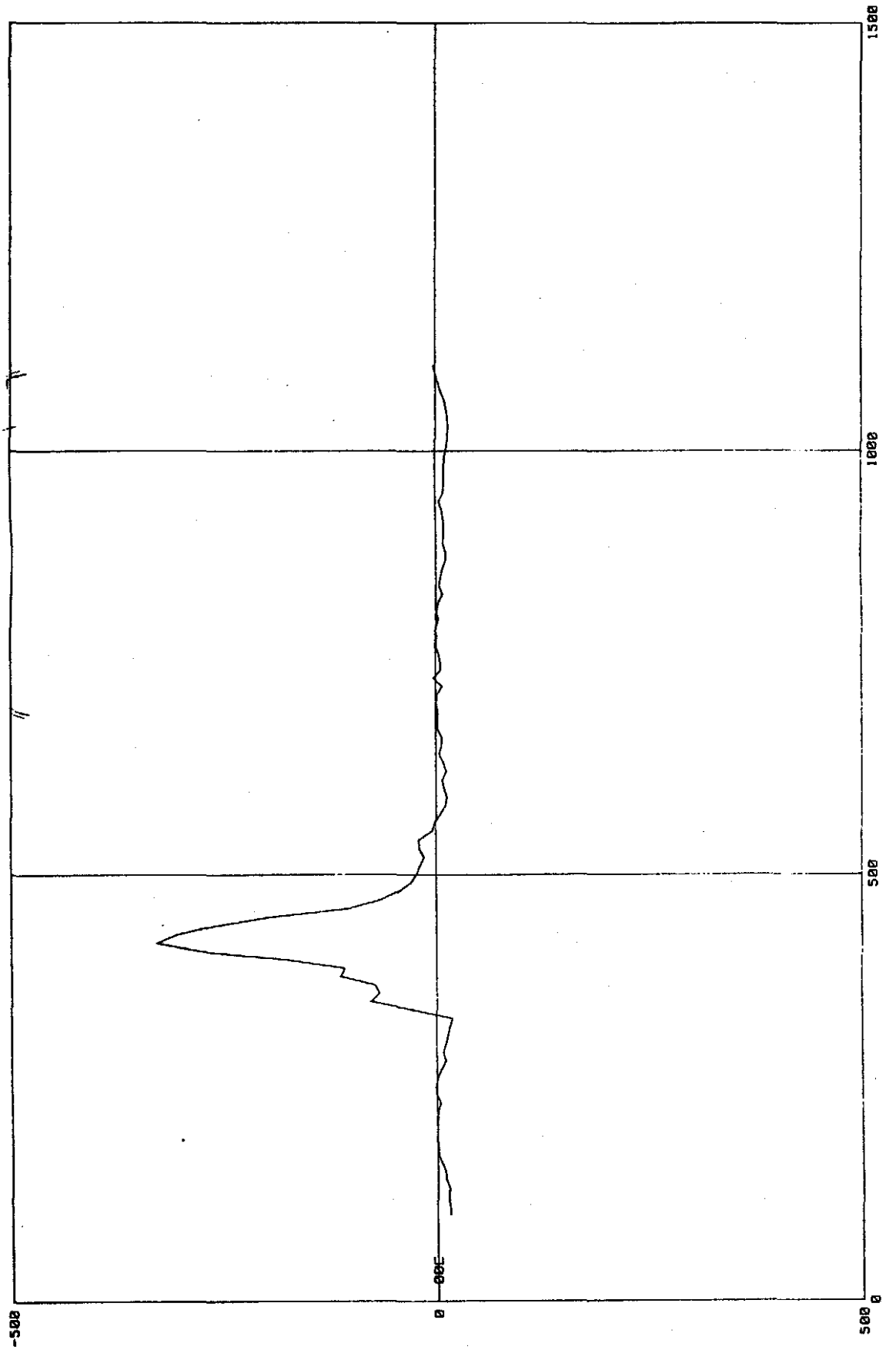
METALS DIVISION

RIANA E.L., TAS
HOUSETOP, 4042/27
TOTAL FIELD
MAGNETICS

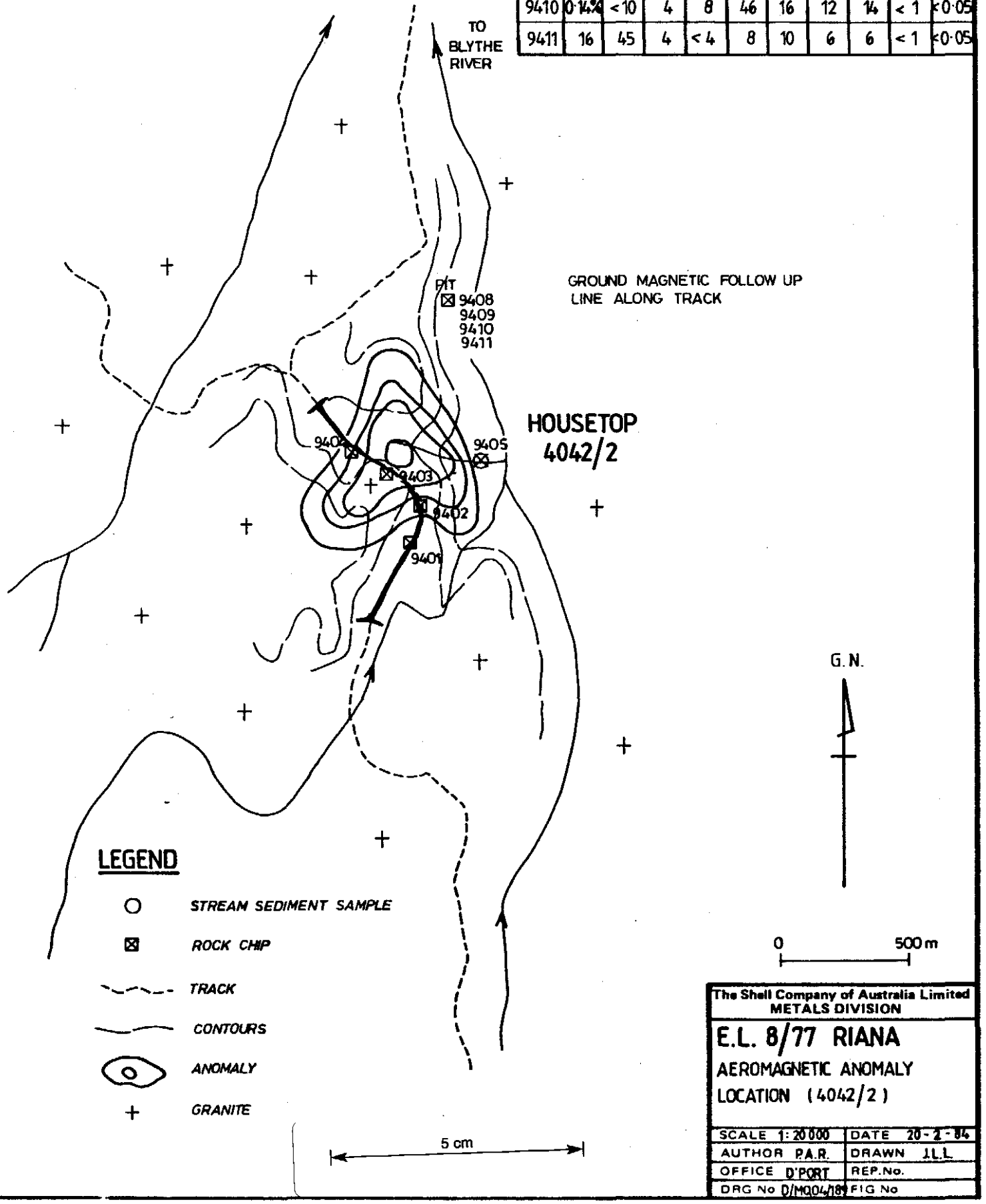
DISTANCE SCALE : 50 M/CM
READING SCALE : 500 /CM
BASE READING : 62000

344093

5 cm



	Sn	WO_3	Mo	Bi	As	Cu	Pb	Zn	Ag	Au
9401	< 4	115	10	< 4	5	10	6	10	< 1	< 0·05
9402	< 4	65	6	< 4	4	16	10	16	< 1	< 0·05
9403	6	65	6	< 4	3	8	10	14	< 1	< 0·05
9404	< 4	45	4	< 4	2	22	14	20	< 1	< 0·05
9405	4	20	6	< 4	3	12	10	14	< 1	< 0·05
9408	0·1%	< 10	14	< 4	< 2	14	8	12	< 1	< 0·05
9409	18	25	4	4	8	8	4	6	< 1	< 0·05
9410	0·14%	< 10	4	8	46	16	12	14	< 1	< 0·05
9411	16	45	4	< 4	8	10	6	6	< 1	< 0·05



The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA

AEROMAGNETIC ANOMALY LOCATION (4042/2)

SCALE 1:20 000	DATE 20-2-84
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG No D/MQ04/189	FIG No

CASTRA, RIANA E.L. ANOMALY 4142/4

This is a broad and elongated aeromagnetic anomaly with a maximum amplitude of 400n T. The ground magnetics are very noisy presumably due to the basalt cover but a broad anomaly occurs at about 1400N on lines 700E and 900E with maximum amplitude about 1200nT. The edge of this anomaly is picked up on line 1500N.

The ground magnetic anomaly is not coincident with the nearby hill and thus is unlikely to be caused by the latter. Since there is an airborne radiometric anomaly coincident with the aeromag anomaly, the presence of Cambrian volcanics seems likely. This should be carefully checked on the ground.

If no obvious cause is aparent, an IP survey (100m dipole, n = 1 to 4) should be carried out on line 700E, from 800 to 1800N, since the original assumption of underlying Gordon limestone may therefore still be appropriate.

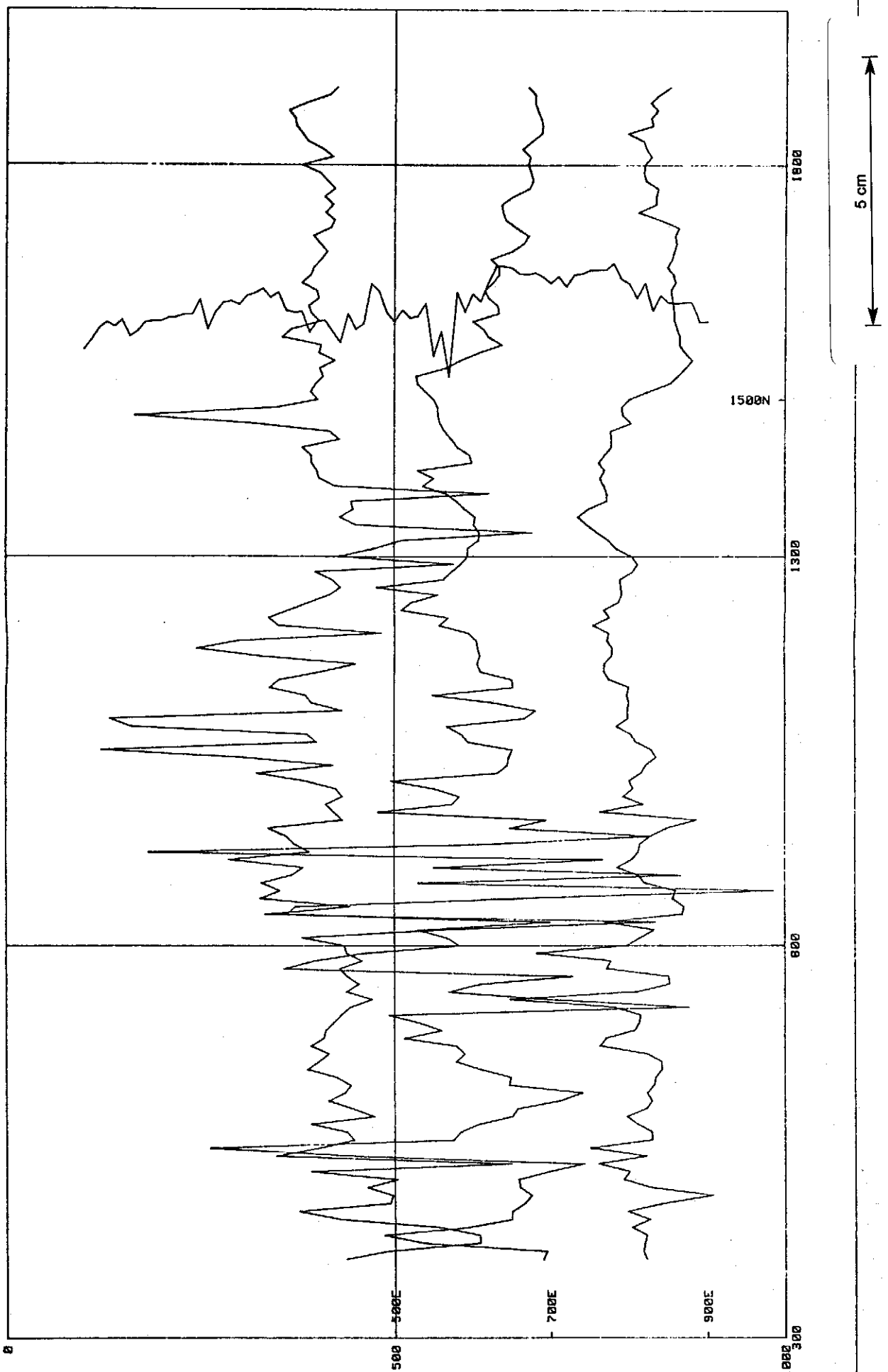
SHELL COMPANY OF AUSTRALIA

METALS DIVISION

RIANA E.L., TAS
CASTRA 4142/4
TOTAL MAGNETICS

DISTANCE SCALE : 50 M/CM
READING SCALE : 500 /CM
BASE READING : 62000

344096

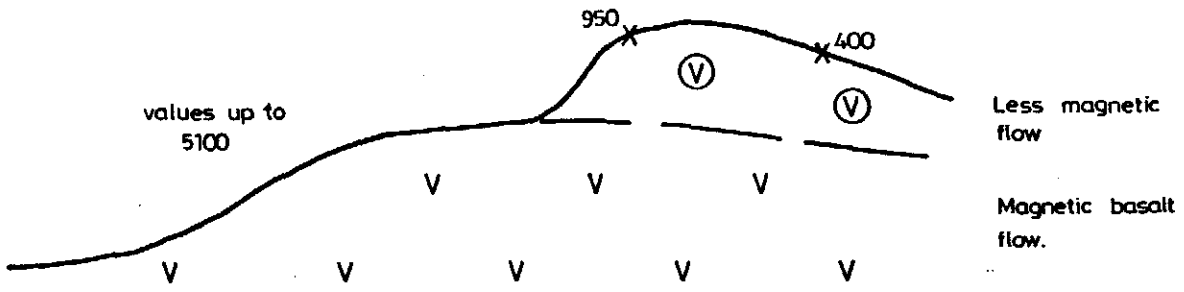


344097

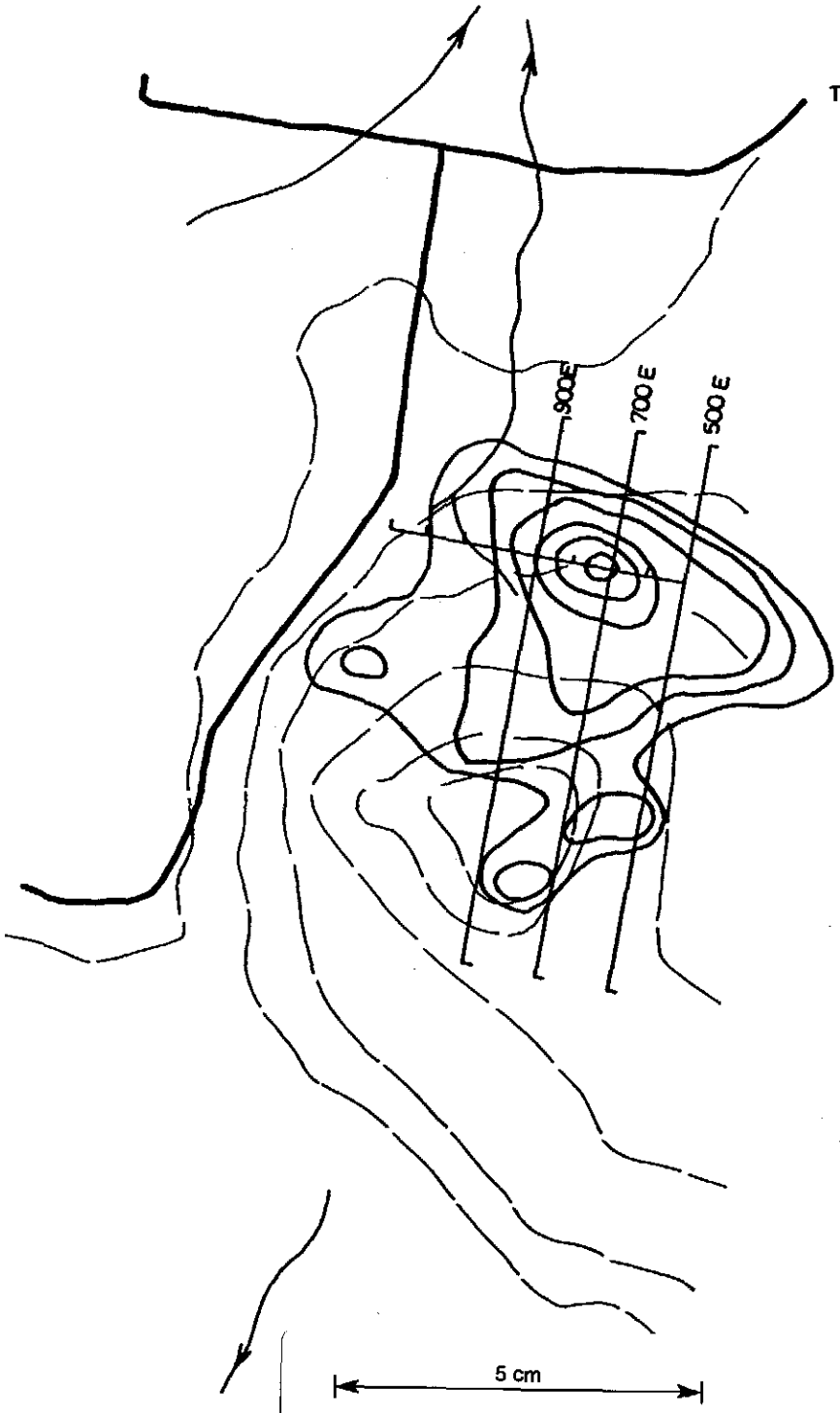
Magnetic Susceptibility = 5100 x 10^{-6} cgs units.

T.S.

LINE 700 E



PLAN



G.N.

CASTRA 4142/4

LEGEND

CONTOURS

ROAD

ANOMALY

0 500 m

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA

AEROMAGNETIC ANOMALY LOCATION (4142/4)

SCALE 1:20000	DATE 20-2-84
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG No D/M004/190	FIG.No.

097

344098

APPENDIX 5

Magnetic Remanence Measurements on Tertiary Basalt

Midgley Falls Anomaly
Castra (Preston) Anomaly
South Riana Anomaly

098

344099

CSIRO

Division of Mineral Physics
Delhi Road, North Ryde, NSW, Australia

A Division of the Institute of Energy and Earth Resources

PO Box 136, North Ryde, NSW, Australia 2113
Telephone (02) 887 8666
Telex AA25817

September 1, 1983

Mr. P.A. Ruxton,
Shell Company of Australia Limited,
P.O. Box 860,
Devonport,
TASMANIA 7310

Dear Peter,

The results of measurements of the magnetic properties of your Tasmanian basalt samples are as follows:

Sample	K	J	Q
Midgely 50N/50W	390	2,640	10.7
Midgely 100N/600E	1,370	15,580	18.1
Midgely 0N/0E	330	4,830	23.2
Preston 900N/700E (CASTRA)	4,760	81,800	27.2
S. Riana 550N/200E	1,530	6,010	6.2

K = cgs (emu) susceptibility X 10^6

J = NRM intensity in microgauss (10 microgauss = 1 gamma)

Q = Koenigsberger ratio = NRM/induced magnetization
= J/KH, where H = 0.63 oe

The samples all bear substantial remanence and the results indicate that remanence overwhelmingly dominates induction in these basalts. Because the samples are unoriented and no palaeomagnetic cleaning has been carried out, the possibility that some of the samples are affected by lightning strikes (and therefore unrepresentative) cannot be ruled out. However the Q values are quite compatible with other Tasmanian Tertiary basalts.

Assuming the NRM is representative of the bulk of the rock it will be either approximately parallel or approximately antiparallel to the present Earth's field, as the rocks are relatively young. Thus interpretation can proceed by assuming magnetization by induction, but with a considerably enhanced susceptibility (if the NRM is normal) or a strong negative susceptibility (if the NRM is reversed).

I hope these results are useful to you.

Yours sincerely,

David Clark

David Clark
Division of Mineral Physics

Commonwealth Scientific and Industrial Research Organization, Australia

APPENDIX 6

CENTRAL LICENCE AREA

Aeromagnetic & INPUT Anomalies

1) Midgley Falls (4144/3) – ground magnetics - stacked profiles
– contour maps
– 1 line of IP 200N

2) Camena (4144/2) – aeromagnetic modelling
– 1 line of recce ground magnetics

3) Wattle Grove (4143/2) – ground magnetics - stacked profiles
– geology

4) Stotts Road (4143/3) – ground magnetics - stacked profiles

5) South Riana (4143/4) – 1 line of recce ground magnetics

6) Knob Park (4144/IR 1) – ground magnetics - stacked profiles
– 1 line of IP 00N

7) Note on INPUT Anomalies IR 1 (Knob Park) & IR 5

Memorandum

P.A.R. 344101

NP04—744

Date 1 August, 1983

From BXN:NH:AJD

To BXH/Devonport (D.W. & P.R.)

MIDGELEY FALLS ANOMALY 4144/3

Herewith the ground magnetic data over this anomaly as follows:

1)	Stacked profiles (unfiltered)	1:5,000, 1000 nT/cm
2)	" " (")	1:5,000, 2000 nT/cm
3)	" " (filtered)	1:5,000, 1500 nT/cm
4)	HP9845 Contours (filtered)	1:5,000, CI = 100 nT
5)	Hand contours (filtered)	1:5,000, CI = 500 nT

The filtered data indicates 2 main anomalies; one in the centre of the grid and one to the east. The former has not been completely closed off to the south. Both these ground anomalies are situated very close to where the aeromag anomalies were plotted so they have been well recovered. The ground mag anomalies are not precisely coincident with the hills in the area, at least as indicated by the topo map, so there is a good likelihood they are not actually caused by basalt hills. The maximum amplitude of the eastern anomaly is greater than 4500 nT on Line 200N which is extremely high even for basalt with remanence. As mentioned by Graham Oakes (memo 4/3/83) modelled susceptibilities are of the order of 50 to 150 x 10^{-3} cgs units which require high remanence values (Q greater than 40).

Remanence and susceptibility of the local basalt is to be measured by the CSIRO, and results are presently awaited. If the results do not suggest basalt can be the cause of the anomaly, then a line of dipole-dipole IP is recommended along Line 200N from 600E to 400W (100 m dipoles, n = 1 to 4). This should indicate the presence of magnetite or pyrrhotite skarn beneath basalt.

N.H.

N. HUNGERFORD

Enc.

101

COMMONWEALTH OF AUSTRALIA

METALS DIVISION

RIANA E.L., TAS
MIDGLEY FALLS 4144/3
TOTAL FIELD
MAGNETICS
(FILTERED)

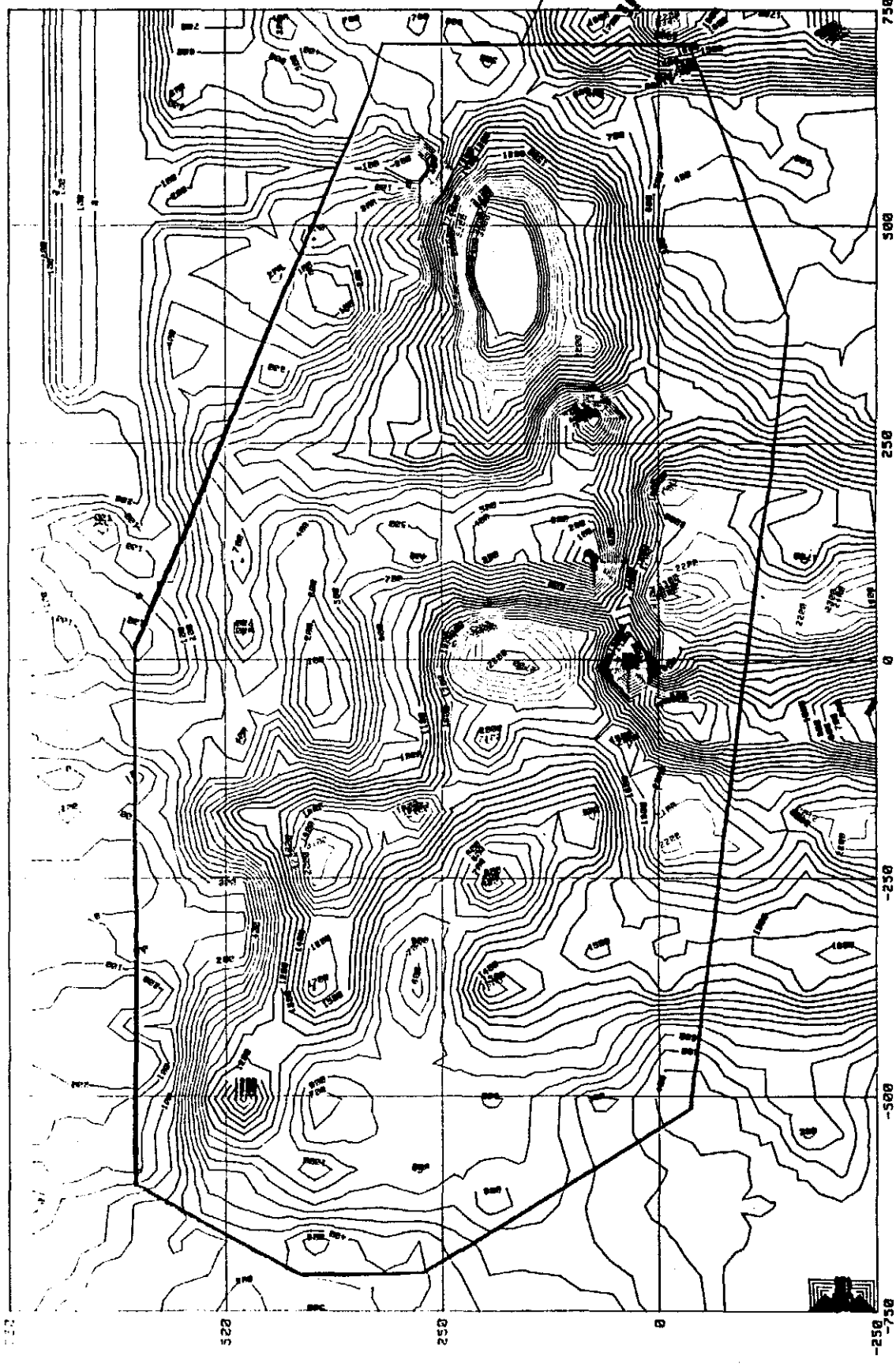
BASE LEVEL : 62000
C.I. = 100
SCALE 1: 5000

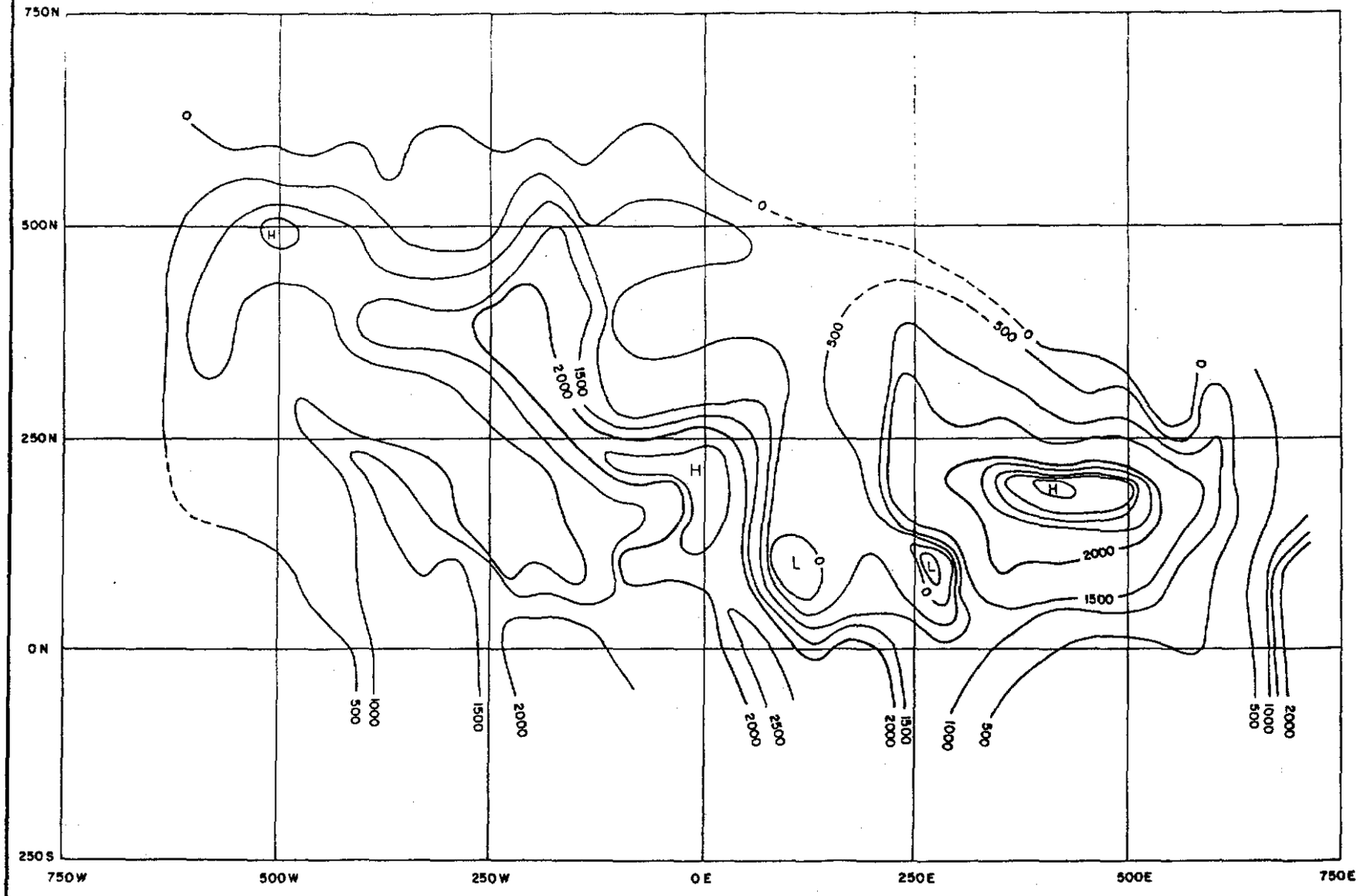
DWG No. 1035

344102

5 cm

DATA INVALID OUTSIDE THIS AREA





BASE LEVEL : 62 000

C.I. 500 nT

5 cm

The Shell Company of Australia Limit
METALS DIVISION

RIANA - E.L. 8/77
TASMANIA
MIDGLEY FALLS, 4144/3
TOTAL FIELD
MAGNETIC CONTOURS
(FILTERED)

SCALE 1:5000	DATE JULY 198
AUTHOR N.H.	DRAWN O.L.
OFFICE A.H.O.	REP No
DRG.No. M004/1031	FIG No.

344103

103

SHELL COMPANY OF AUSTRALIA

METALS DIVISION

MIDGELY FALLS 4/4½/3

TOTAL FIELD
MAGNETICS

DISTANCE SCALE : 50 M/CM

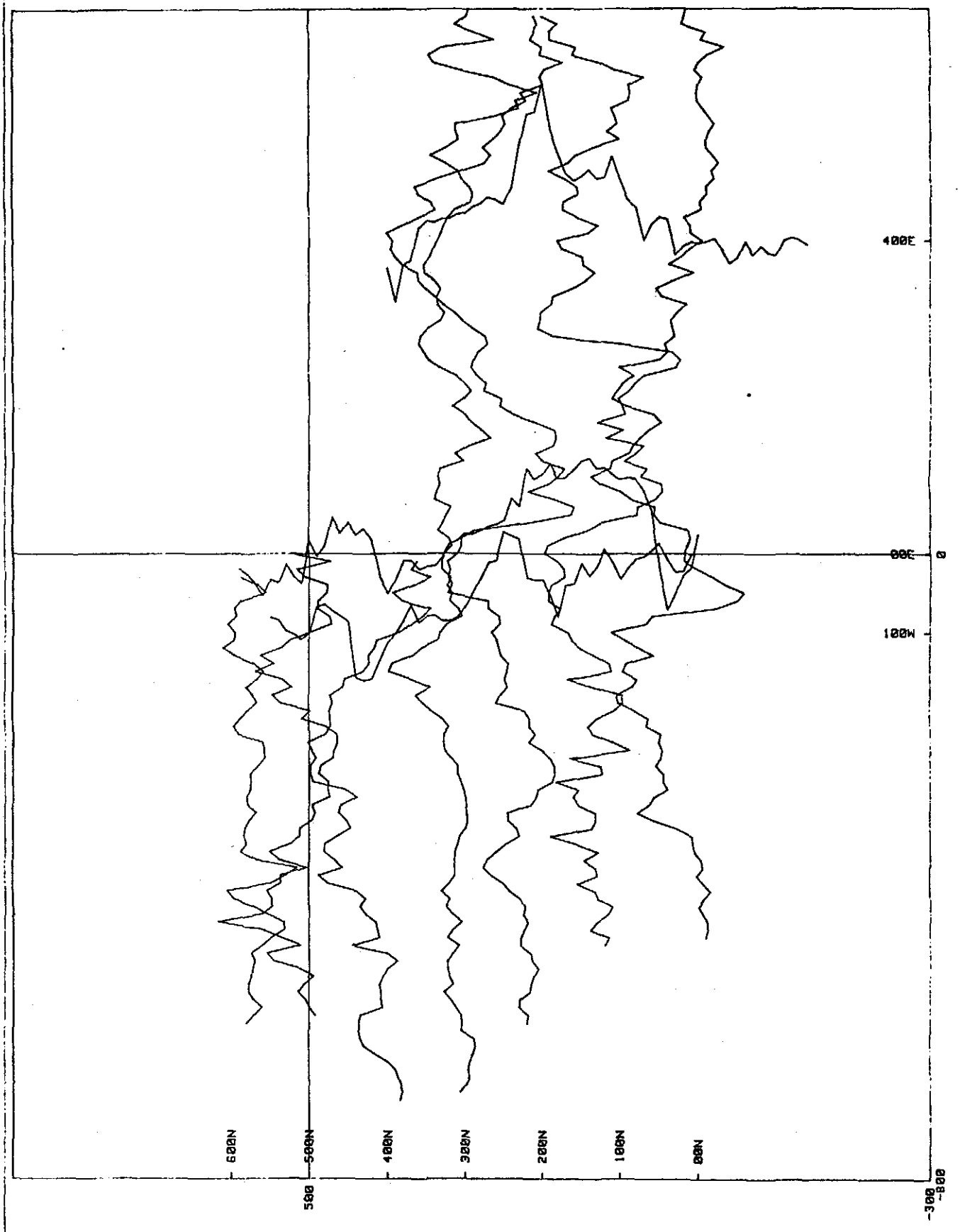
READING SCALE : 1000 /CM

BASE READING : 62500

DRWG NO. 1612

344104

5 cm



AIRBORNE GEOPHYSICS
(EM, MAG, etc)

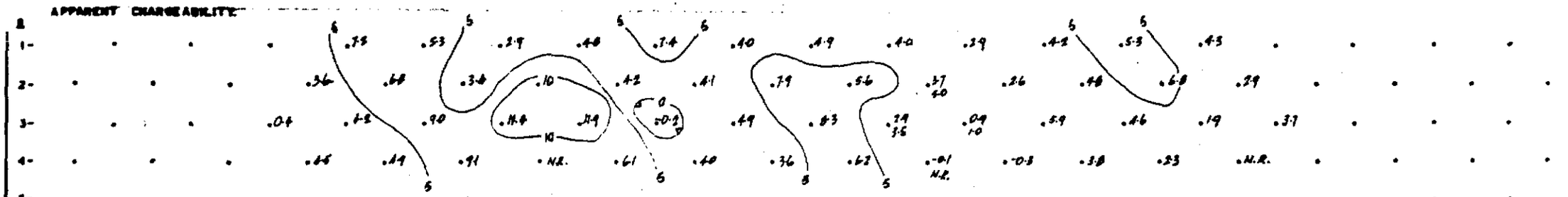
104

34410E

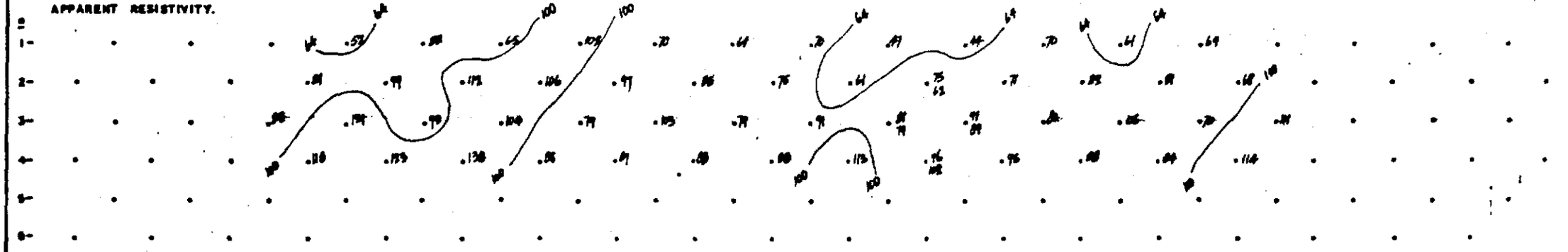
GEOLOGY
& TOPOGRAPHY

400 W 200 W 00 200 E 400 E 600 E

APPARENT CHARGEABILITY



APPARENT RESISTIVITY.



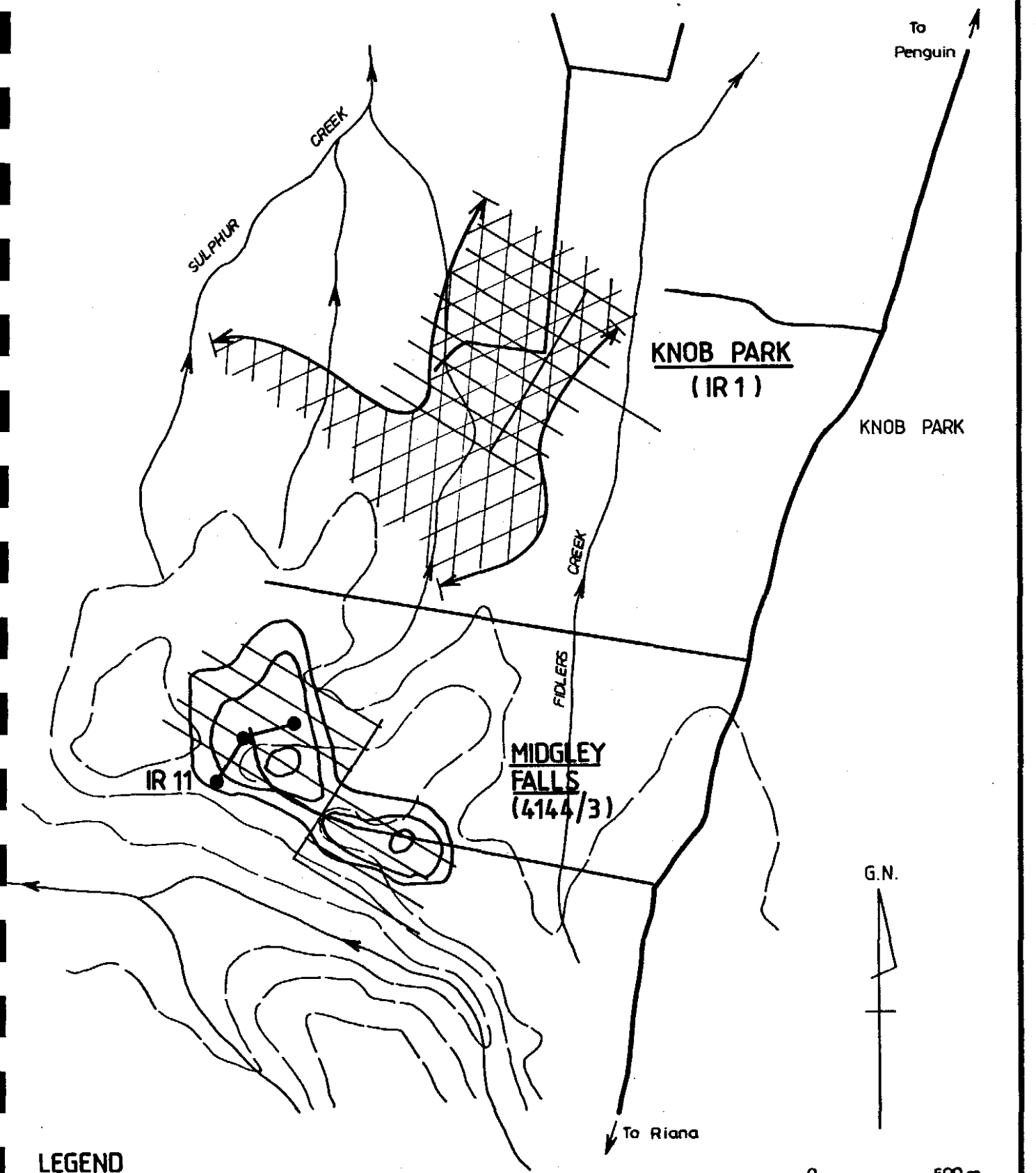
Contractor : SCINTREX
Date : 23-6-88
Timing : 2 Sec .
Transmitter : 1 PTAA 3kw
Receiver : 1 PR6 (308122)
Integration Time :
Array : DIPOLE - DIPOLE
Dipole length : 100 m

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
MIDGELY FALLS
I.P. / RESISTIVITY SURVEY
200N LINE

SCALE	DATE 25-8-88
AUTHOR	DRAWN J.L.L.
OFFICE COPY	REF No
DRG No	DRG No

344106



LEGEND

- CONTOURS
- ROADS
- AEROMAGNETIC ANOMALY
- INPUT ANOMALY

5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA

AEROMAGNETIC / INPUT ANOMALY LOCATION

SCALE 1:20000	DATE 20-2-83
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG No [illegible]	FIG No

9. GROUP 3

9.1. CAMENA - ANOMALY 4144/2

9.1.1. General

The Camena anomaly corresponds to an alluvium covered valley of the Blythe River, with Tertiary basalts forming the valley sides. The sub-basalt geology is probably Ordovician chert and conglomerate, occurring very close to the Housetop Granite contact. The relatively broad alluvial valley is in itself atypical, since the Blythe River is normally very narrow and deeply incised.

9.1.2. Ground Magnetic Survey

A single 1 km E-W ground magnetic traverse across the anomaly revealed a broad, high amplitude anomaly of around 64000 nT with no significantly lower background values being obtained. The high values would be typical of a magnetite-bearing basalt, and in fact, the magnetic profile has the characteristic noisy signature of basalts. Refer Figs. 6 and 7.

However, rare basalt float is non-magnetic, and not an obvious anomaly source. In addition, modelling of the airborne anomaly indicates a deep 600 - 800 metre source, rather than a shallow basalt source.

9.1.3. Interpretation & Conclusions

The Camena anomaly is a deep source, probably due to a basic/ultrabasic intrusive. The ground magnetic profile gives a high amplitude anomaly, to which a basalt 'magnetic noise' component is added. Shallow source, localized highs appear to correspond to basalt plateau edges.

In view of the excessive depth and size of the source body, no further follow-up work is proposed at Camena.

344108

MEMO

DATE 28th June, 1982.

FROM DMN/Devonport

TO DMH/Devonport (P. Ruxton)

Re: CAMENA AEROMAGNETIC MODELS

I have tried some MAGMOD modelling of the aeromagnetic data on line 233E, over the Camena anomaly. The main aim of this modelling was to determine if a body at less than 300 metres depth could be the cause of the anomaly, given that a deeper body is unlikely to be of economic interest to us. (Nb. all depths referred to here are with respect to flight elevation - depth beneath the surface will be roughly 70 metres less).

Four models are attached, for bodies at depths of 200, 300, 750 and 1000 metres (roughly). It can be seen that only the deeper two bodies give a reasonable fit to the observed data. From this it appears that the body causing the anomaly is not less than 300 metres deep, and probably greater than 500 metres deep. It is conceivable that the source is shallower, but it would then need to have an unusual shape and be very large (certainly greater than 1 km square in plan view). Such a large body is also unlikely to be of economic interest.

The most likely explanation for the anomaly is an ultrabasic plug of susceptibility of the order of 20,000 x 10^{-6} cgs and depth greater than 500 metres. No further work is recommended on this anomaly.

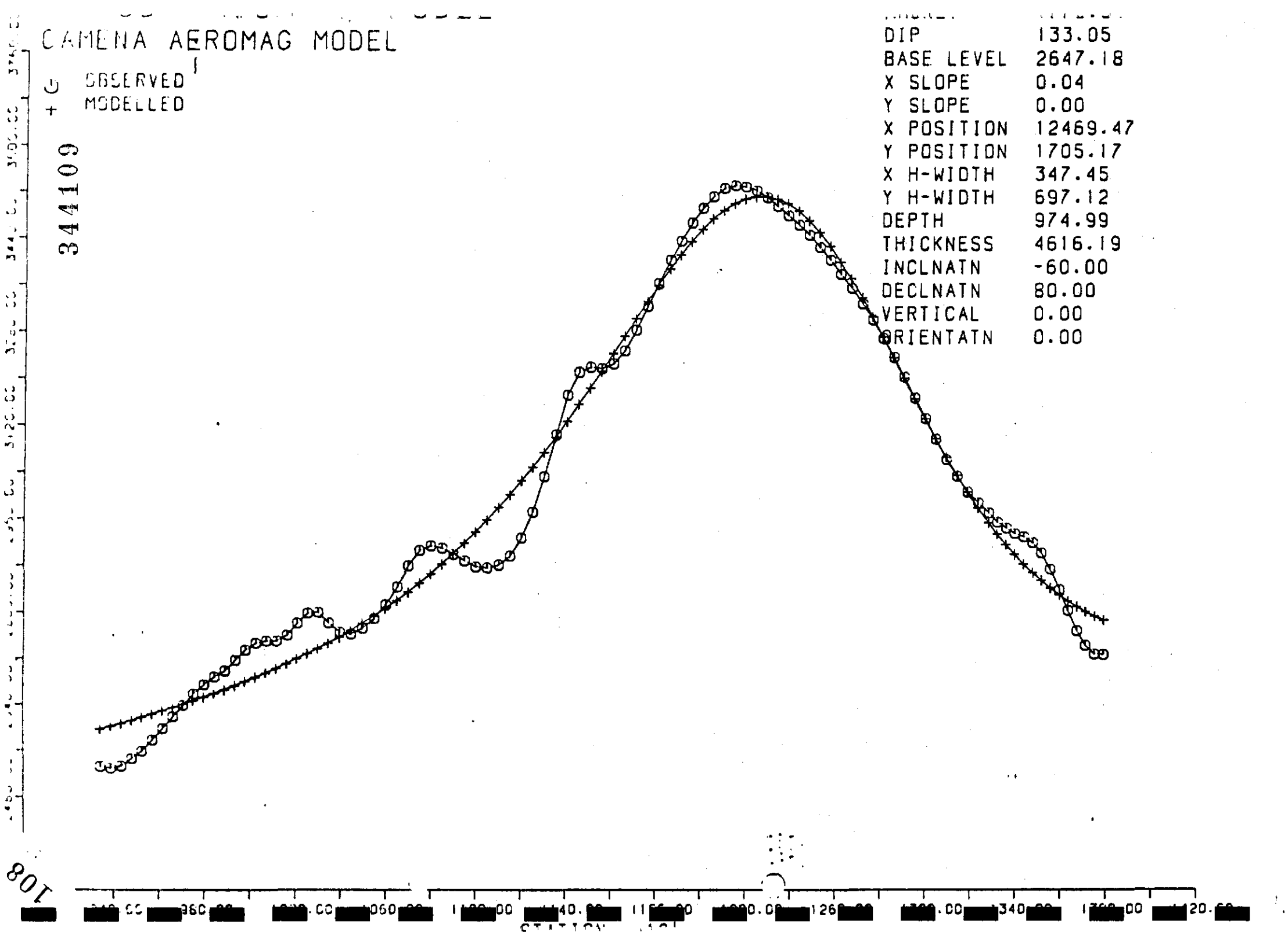
FORM 32/6000

CAMENA AEROMAG MODEL

+ OBSERVED
MODELLED

344109

DIP	133.05
BASE LEVEL	2647.18
X SLOPE	0.04
Y SLOPE	0.00
X POSITION	12469.47
Y POSITION	1705.17
X H-WIDTH	347.45
Y H-WIDTH	697.12
DEPTH	974.99
THICKNESS	4616.19
INCLNATN	-60.00
DECLNATN	80.00
VERTICAL	0.00
ORIENTATN	0.00

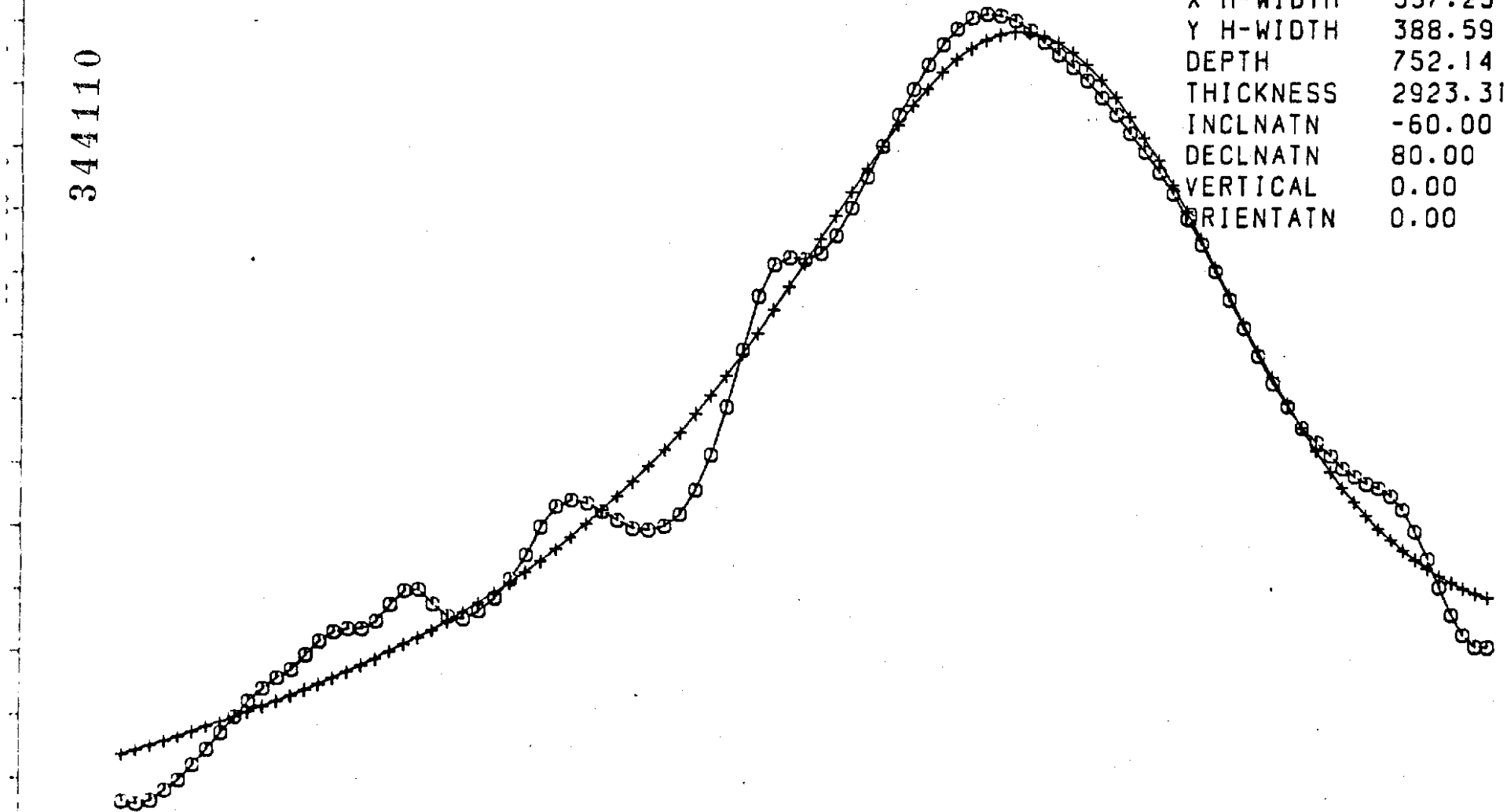


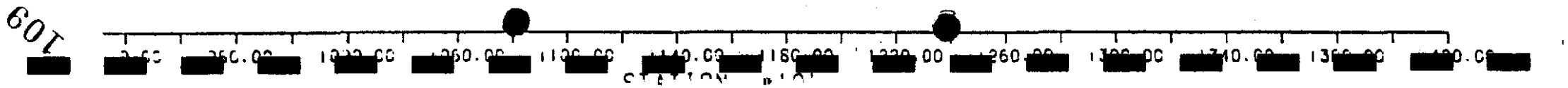
CAMENA AEROMAG MODEL

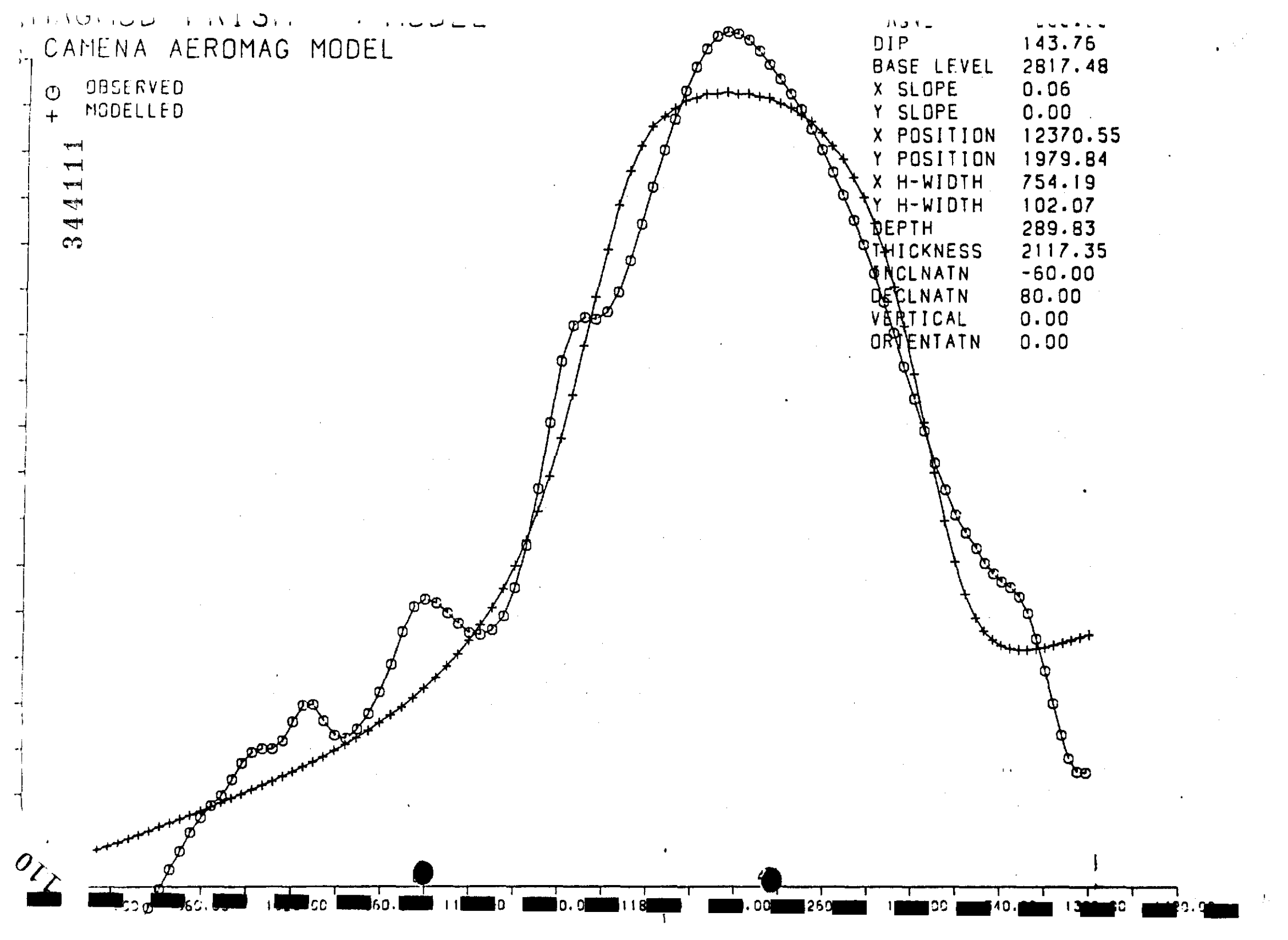
o OBSERVED
+ MODELLED

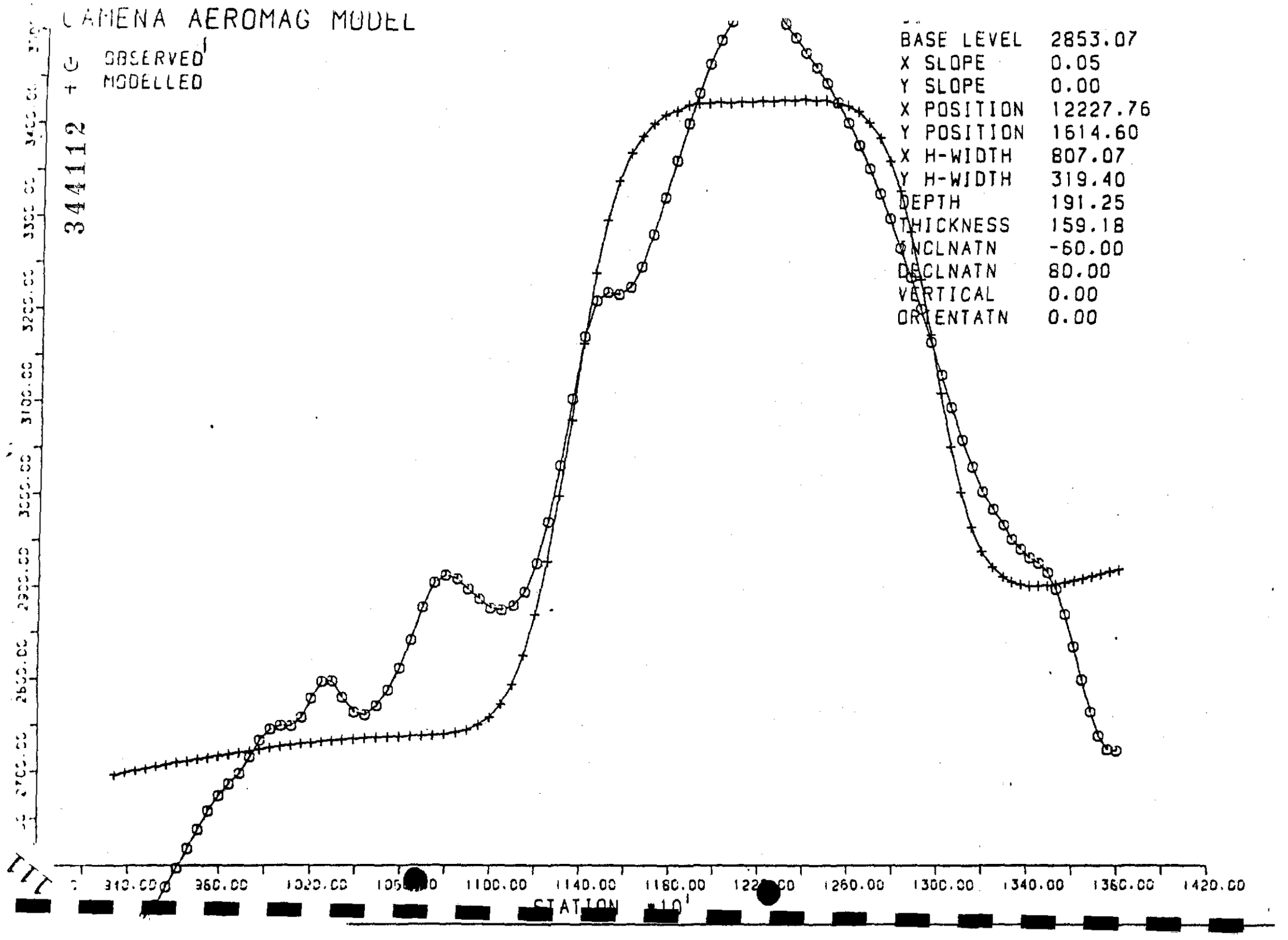
3441110

DIP	141.95
BASE LEVEL	2676.78
X SLOPE	0.05
Y SLOPE	0.00
X POSITION	12545.54
Y POSITION	1551.44
X H-WIDTH	537.25
Y H-WIDTH	388.59
DEPTH	752.14
THICKNESS	2923.31
INCLNATN	-60.00
DECLNATN	80.00
VERTICAL	0.00
ORIENTATN	0.00






CAMENA AEROMAG MODEL
OBSERVED
MODELLED
344111
DIP 143.76
BASE LEVEL 2817.48
X SLOPE 0.06
Y SLOPE 0.00
X POSITION 12370.55
Y POSITION 1979.84
X H-WIDTH 754.19
Y H-WIDTH 102.07
DEPTH 289.83
THICKNESS 2117.35
INCLNATN -60.00
DECLNATN 80.00
VERTICAL 0.00
ORIENTATN 0.00

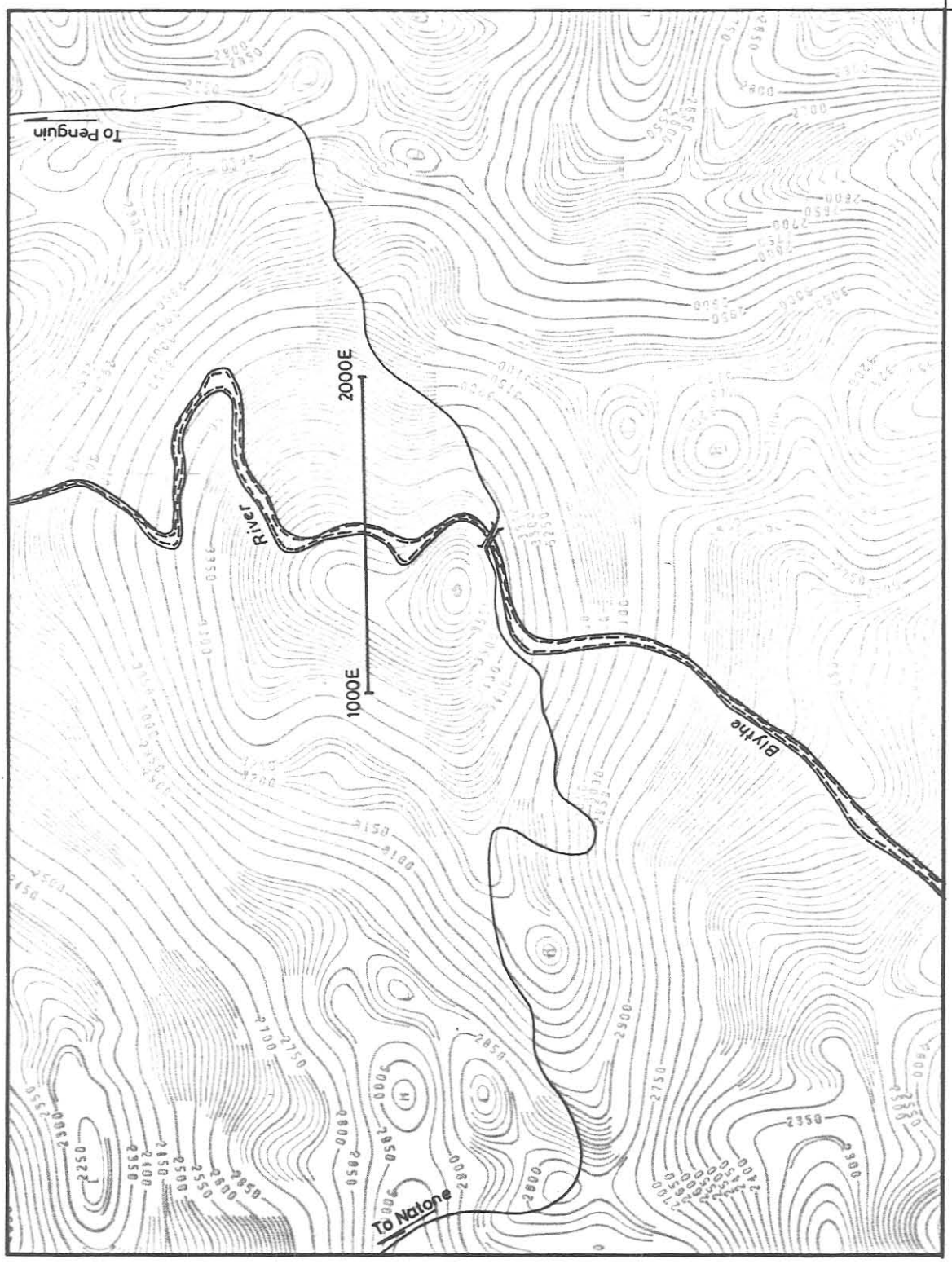

CAMENA AEROMAG MODEL
OBSERVED
MODELLED
344112 + C
BASE LEVEL 2853.07
X SLOPE 0.05
Y SLOPE 0.00
X POSITION 12227.76
Y POSITION 1614.60
X H-WIDTH 807.07
Y H-WIDTH 319.40
DEPTH 191.25
THICKNESS 159.18
INCLNATN -60.00
DECLNATN 80.00
VERTICAL 0.00
ORIENTATN 0.00
960.00
1020.00
1100.00
1140.00
1180.00
1260.00
1300.00
1340.00
1360.00
1420.00
STATION *10

112

344113

5440000 N

414 000 E



T. N.

5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L.8/77 RIANA

ANOMALY 4144/2 CAMENA

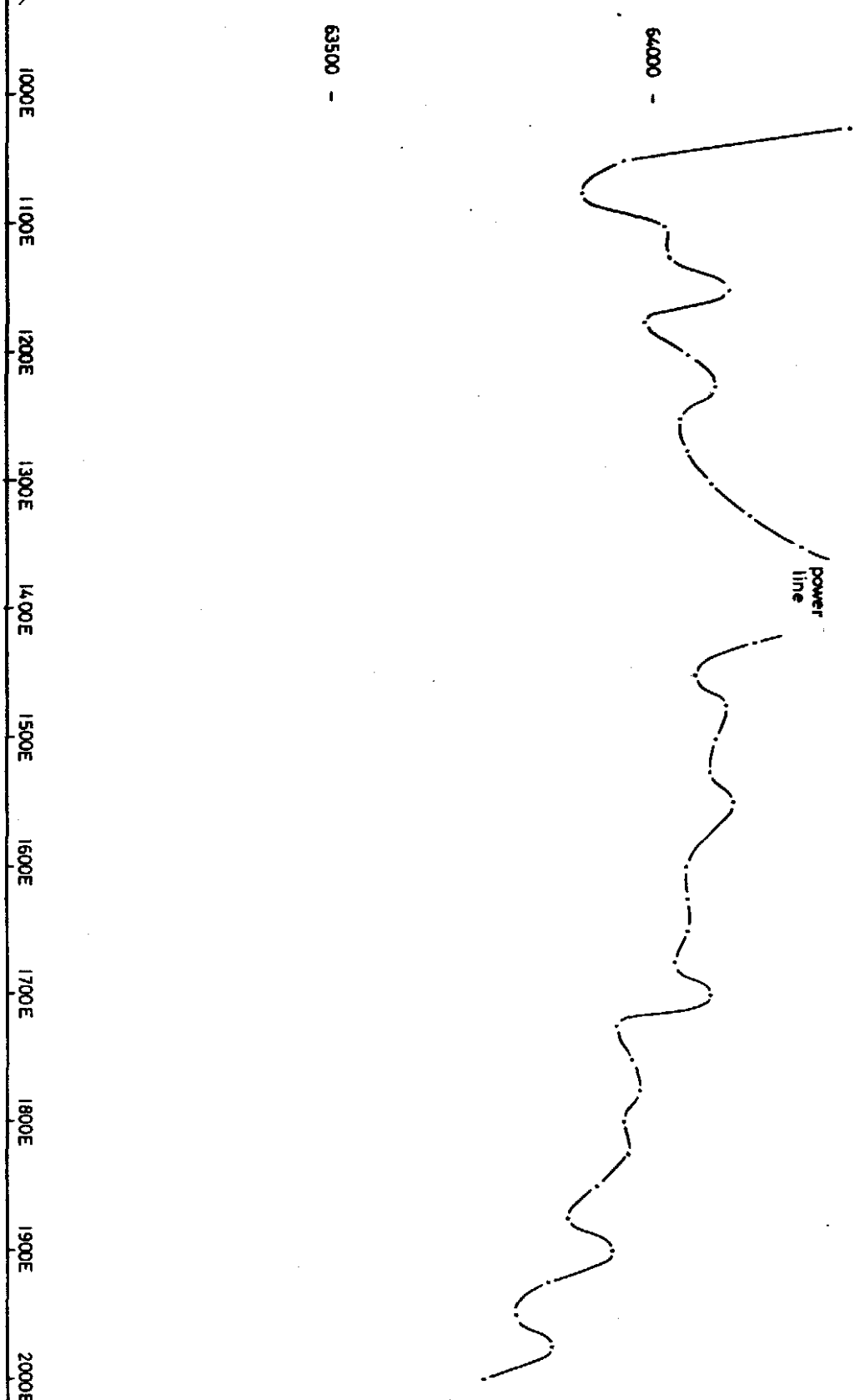
LOCATION OF GROUND MAGNETIC TRAVERSE

Scale 1 : 20000

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/079
DATE 23-10-81	AUTHOR L.D.B.
DRAWN H.L.H.	OFFICE Devonport.

113

344114



5 cm

The Shell Company of Australia Limited METALS DIVISION	
RIANA E.L. 8/77 CAMENA ANOMALY 3 PROTON PRECESSION MAGNETOMETRY Scale 1:5000	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D MQ04 008
DATE 16 - 12 - 80	AUTHOR S. Halley
DRAWN O H	OFFICE Devonport

WATTLE GROVE, RIANA E.L., ANOMALY 4143/2

The aeromag anomaly of 450n T has been recovered as a ground manetic anomaly of about 2500n T. The source is highly magnetic and shallow, so that a careful ground check should locate and identify the cause at about 600E on the 3 lines 500N, 600N and 700N.

The anomaly is apparently located on a granite window in the basalt, and is presumably a weathering resistant paleo-high due to the particular mineralogy of the source (c.f. Mt. Bischoff).

Once the cause has been verified and sampled, further work can then be determined as appropriate.

SHELL COMPANY OF AUSTRALIA

METALS DIVISION

WATTLE GROVE, 4143/2

TOTAL FIELD
MAGNETICS

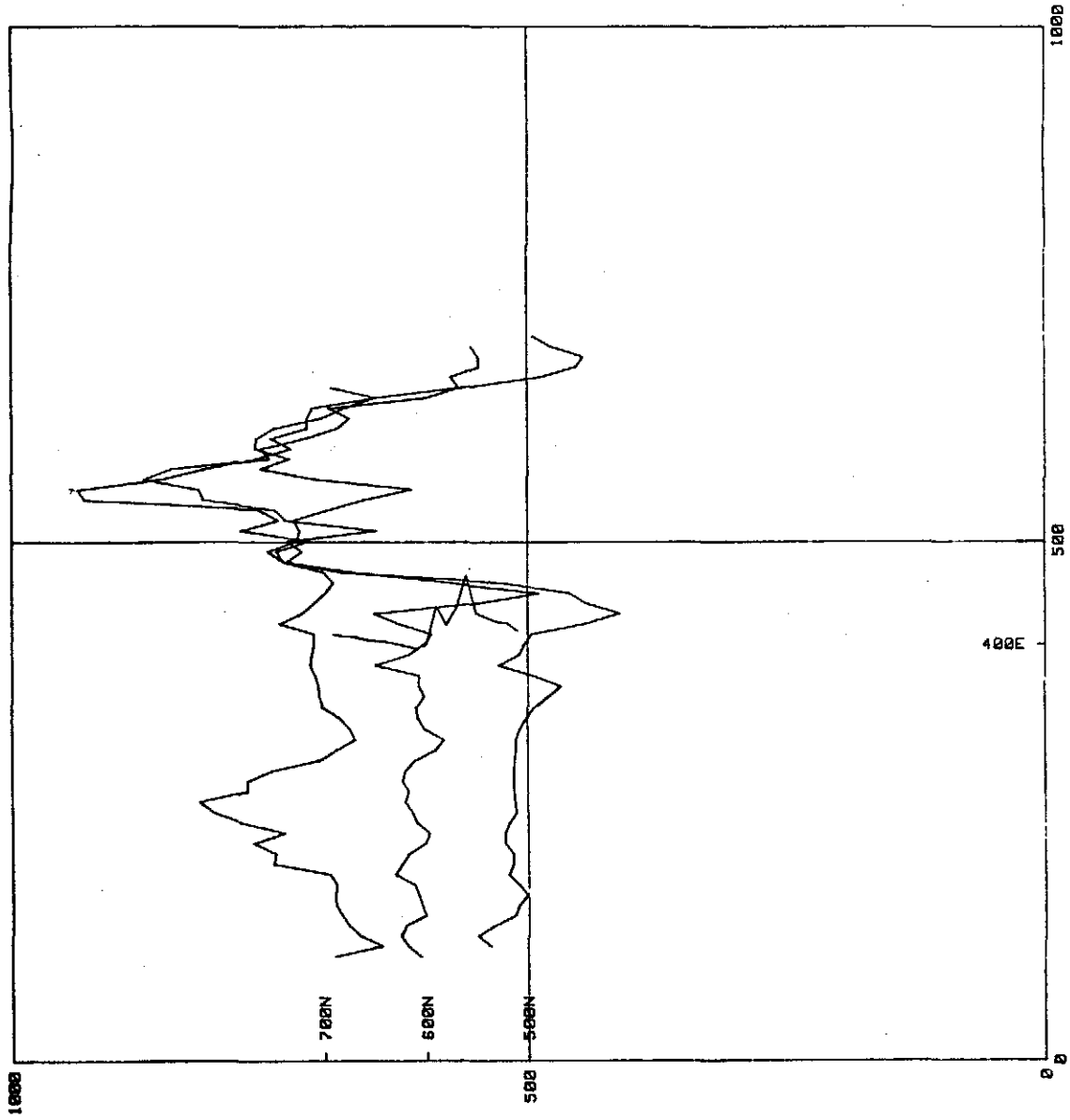
DISTANCE SCALE : 50 M/CM

READING SCALE : 500 /CM

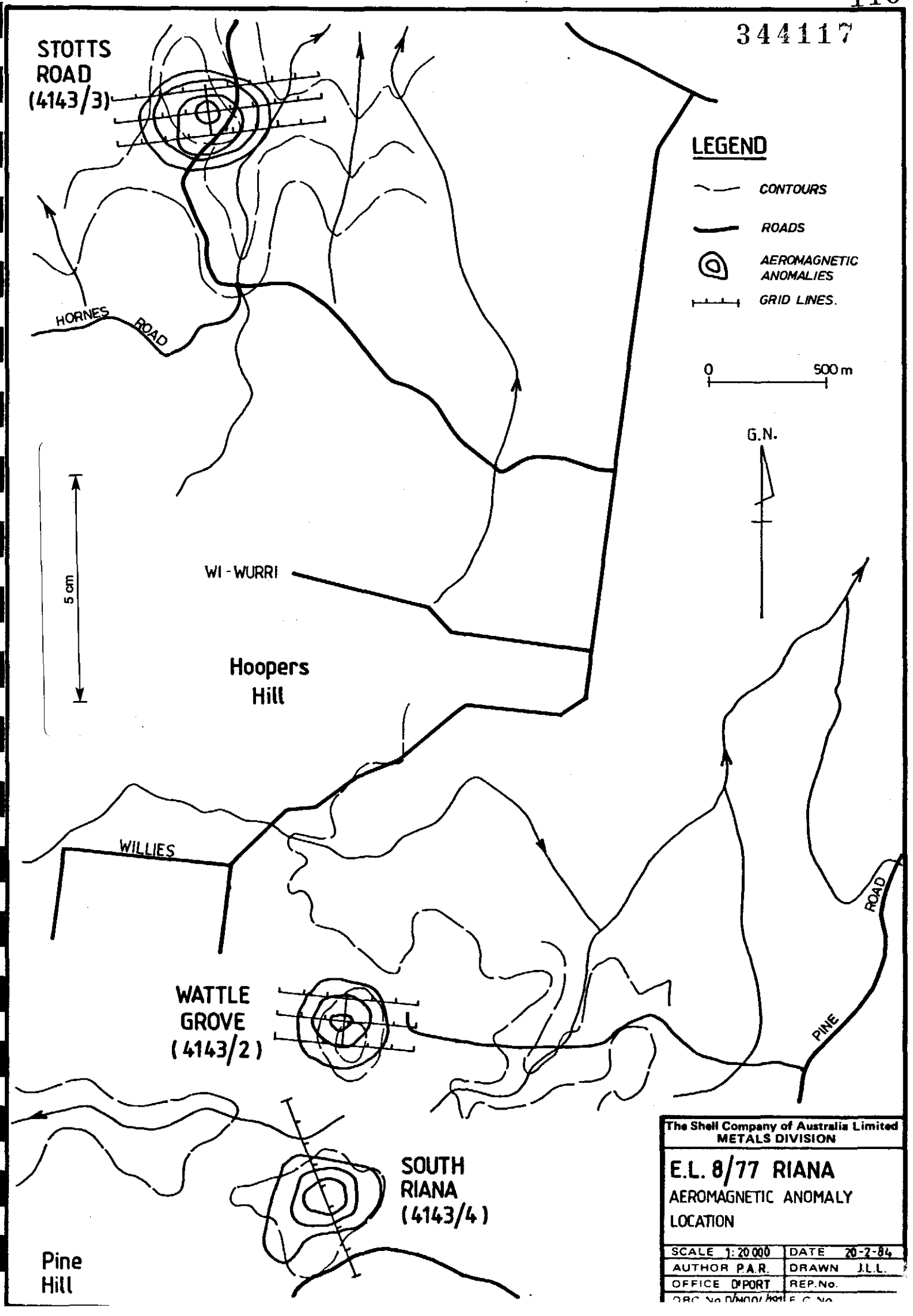
BASE READING : 63000

344116

5 cm



344117

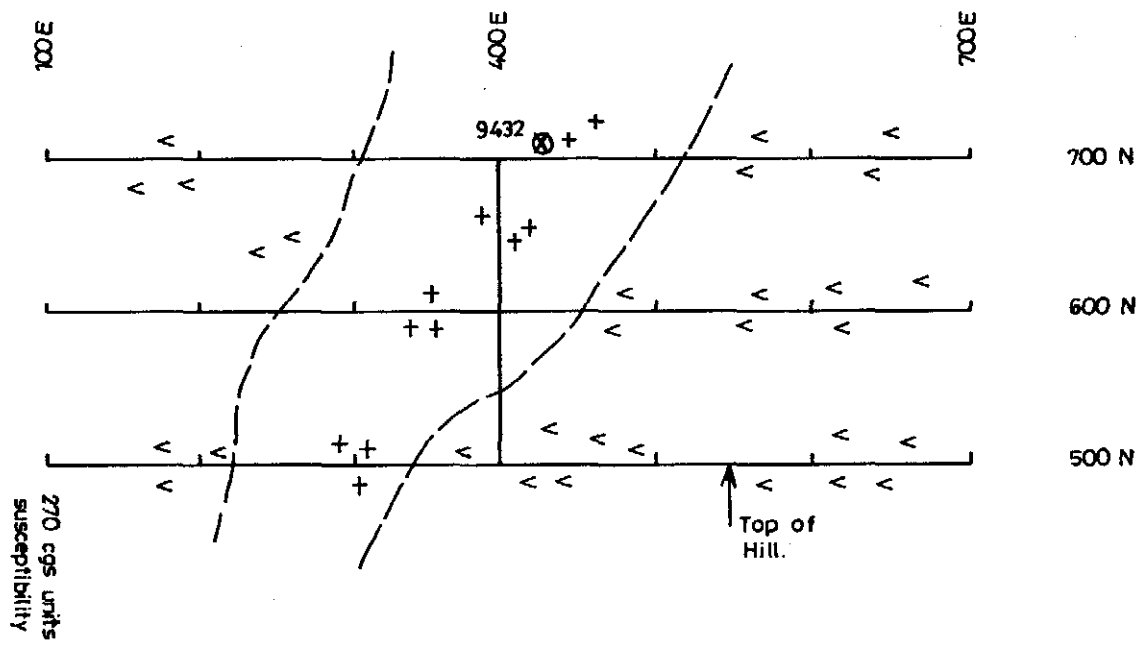


The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
AEROMAGNETIC ANOMALY LOCATION

SCALE 1:20 000	DATE 20-2-84
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
QBC No D/M00/ [illegible]	E.C. No

344118



LEGEND

V V *TERTIARY BASALT (mantles hills.)*

\+ + *HOUSETOP GRANITE*

⊗ 9432 *ROCK SAMPLE (assay results in Appendix1)*

	Sn	WO_3	Mo	Bi	As	Cu	Pb	Zn	Ag	Au
9432	8	25	< 4	6	2	8	10	12	< 1	< 0·05 ppm

0 10 20m

5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
WATTLE GROVE GRID
GEOLOGY

SCALE 1:500	DATE 20/2/84
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG No D/MQ04/192	FIG No

STOTTS ROAD, RIANA E.L., ANOMALY 4143/3

This strong aeromag anomaly of maximum amplitude 600 nT has been recovered on the ground on lines 200N and 100N (amplitude up to 2000n T.). The anomaly is broad and noisy but well distinguishable, and appears to be deep with a possible west dip.

The anomaly could be due to a basalt hill but this is not at all certain. If fresh outcrop is present, basalt samples should be obtained and sent for remanence measurements. If these measurements do not account for the high amplitude anomaly, then a line of IP (100 m dipole, n = 1 to 4) is recommended along 100N fom 0 to 1000 E.

SHELL COMPANY OF AUSTRALIA

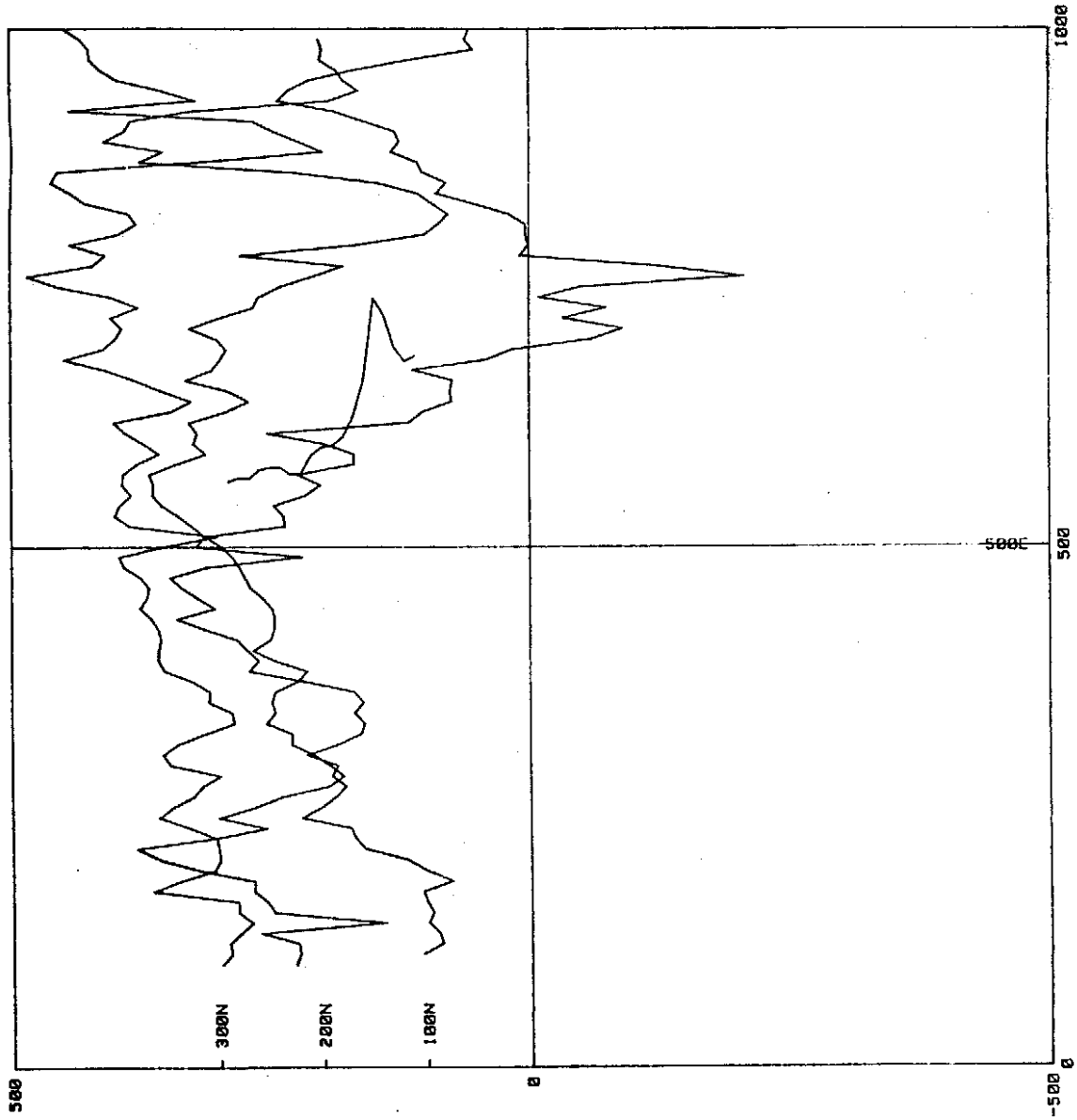
METALS DIVISION

RIANA E.L., TAS
STOTTS RD., 4143/3
TOTAL FIELD
MAGNETICS

DISTANCE SCALE : 50 M/CM
READING SCALE : 500 /CM
BASE READING : 62000

344120

5 cm



SOUTH RIANA, RIANA E.L., ANOMALY 4143/4

The aeromagnetic anomaly is sharp with an amplitude of 350n T, and is readily apparent on the single line of ground magnetics (200E) at about 500N, with a sharp peak of 2500n T.

The anomaly is shallow and appears to correlate directly with a basalt hill whichis therefore its probable cause. However this may be related to the Wattle Grove anomaly so further work is dependant on the work there.

SHELL COMPANY OF AUSTRALIA

METALS DIVISION

RIANA E.L., TAS
SOUTH RIANA, 4143/4
TOTAL FIELD
MAGNETICS

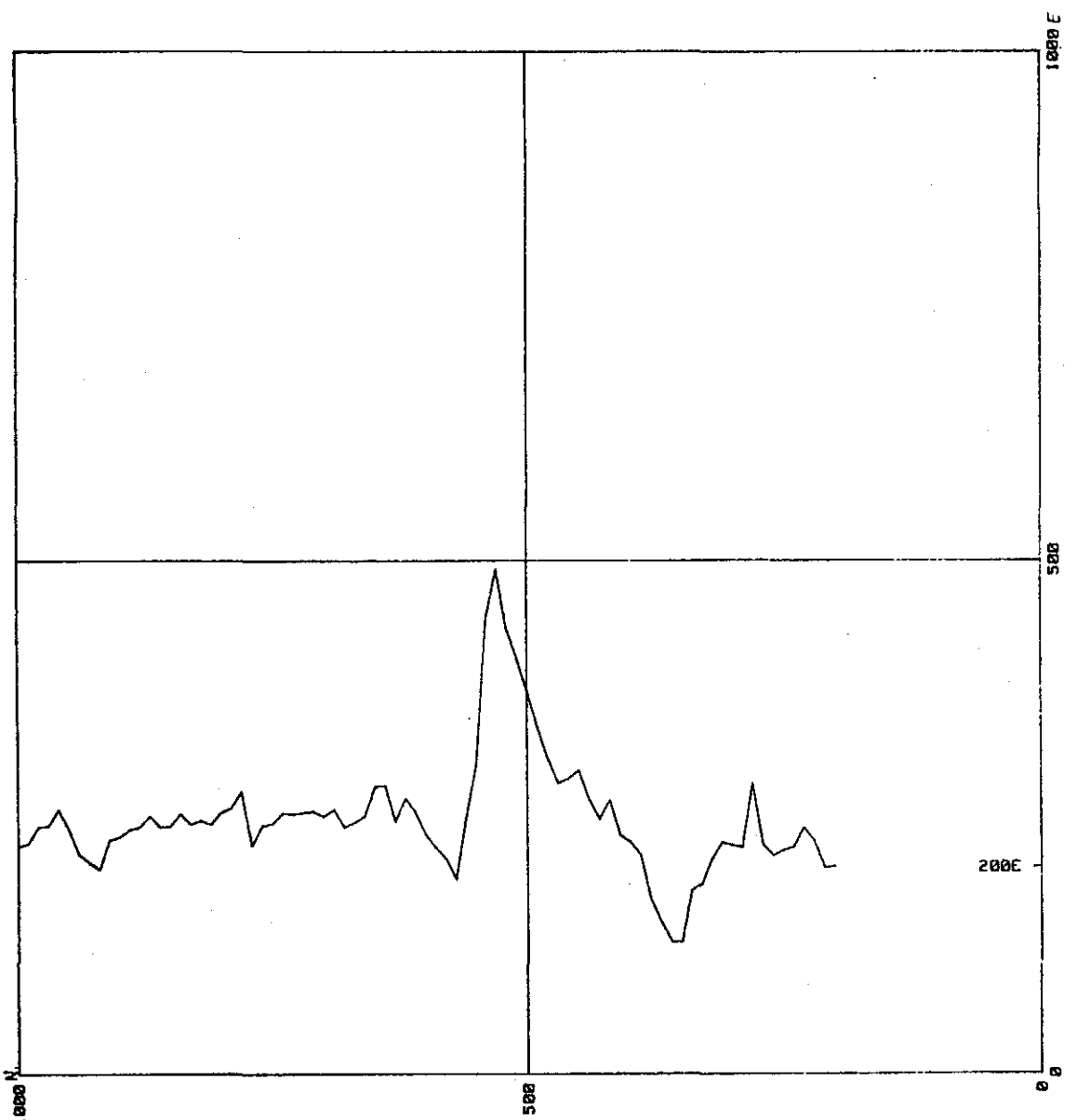
DISTANCE SCALE : 50 M/CM

READING SCALE : 500 /CM

[redacted] READING = [redacted]

344122

5 cm



KNOB PARK, RIANA E.L., ANOMALY 4144/~~IR~~I

Note the number allocated to this anomaly. The aeromagnetic anomaly of 200n T has not been properly recoveed on the ground, since the grid was not located correctly over it. However anomalies are apparent at the western end of lines 100N and 200N, with amplitudes up to 1000 nT, despite the noisy character of the profiles.

It appears that the anomaly is not caused by the nearby basalt hill, so that the following grid extensions are recommended.

Line 100N - extend west 400m to 1000W
Line 200N - extend west 400m to 1000W
Line 300N - grid 300W to 1000W

These lines should all then be surveyed with ground mag. and a line of IP (100m dipole, n = 1 to 4) is then advisable.

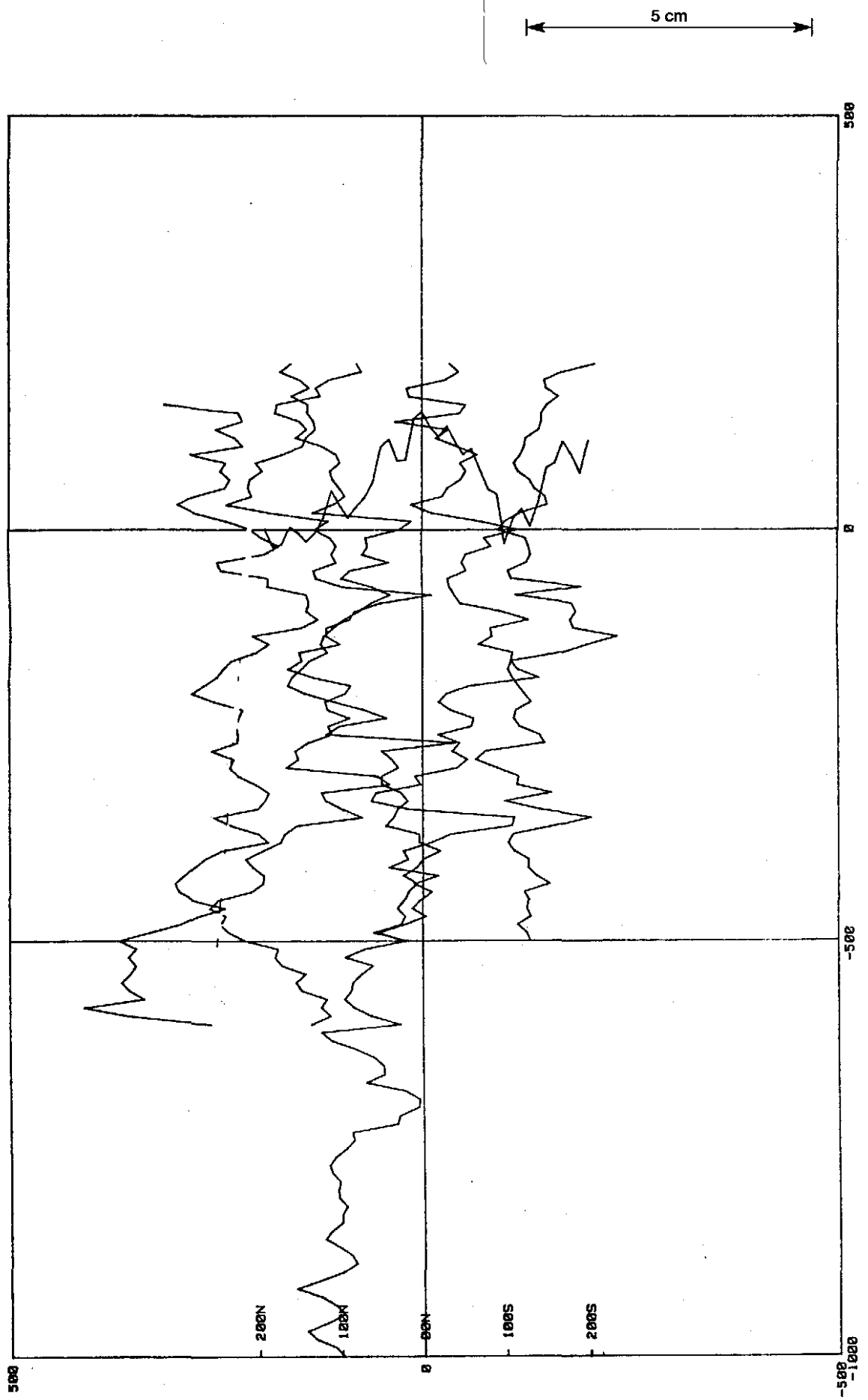
SHELL COMPANY OF AUSTRALIA

METALS DIVISION

RIANA E.L., TAS
KNOB PARK 4144/IR1
TOTAL FIELD
MAGNETICS

DISTANCE SCALE : 50 M/CM
READING SCALE : 500 /CM
BASE READING : 62000

344124

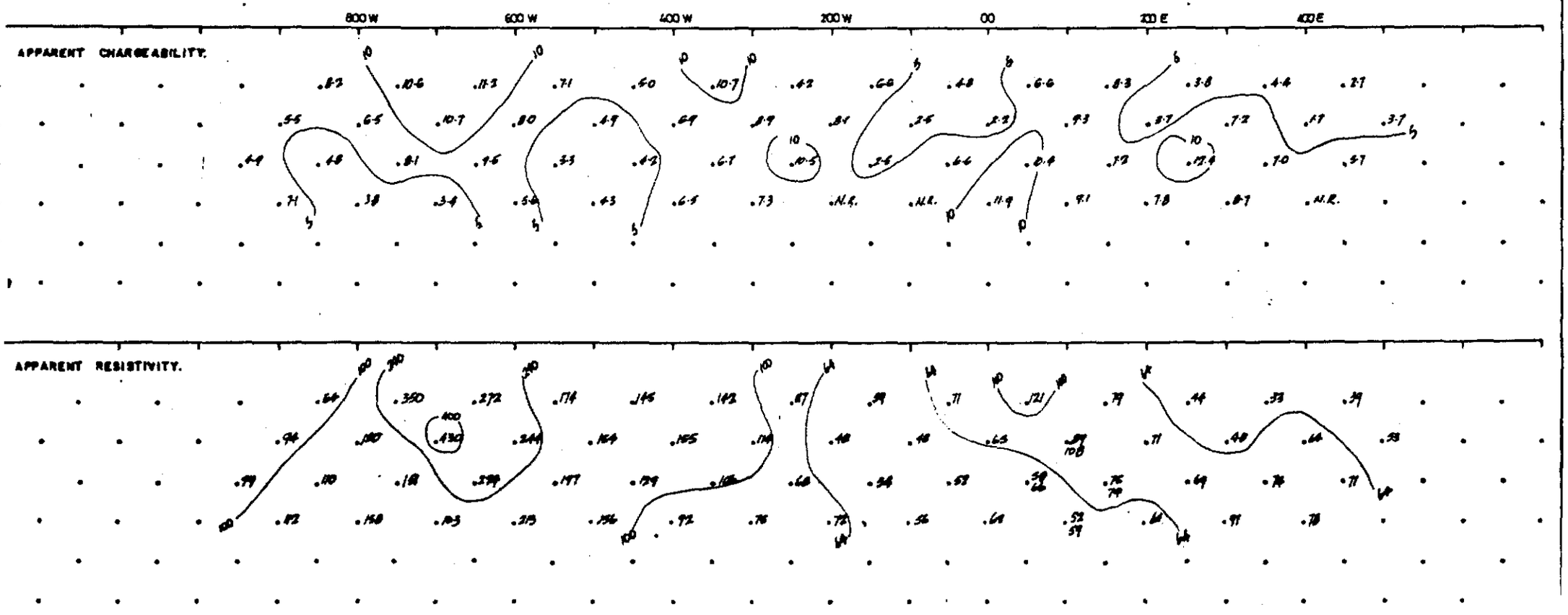


AIRBORNE GEOPHYSICS
(EM, MAG, etc)

124

344125

GEOLOGY
& TOPOGRAPHY



Contractor : SCINTREX PTY. LTD.
Date : 22-6-68
Timing : 2 Sec.
Transmitter : 1 PTAA 2kw
Receiver : 1 PRS (30812)
Integration time :
Array : DIPOLE - DIPOLE
Dipole length : 100 m

The Shell Company of Australia Limited
METALS DIVISION
E.L. 8/77 RIANA
KNOB PARK
I.P. / RESISTIVITY SURVEY
CON
SCALE
DATE
AUTHOR
DRAWN
OFFICE
REP. No.
FILE No.

INPUT ANOMALIES

IR 1 (KNOB PARK)

Geoterrex recommended follow-up with a "deep penetration, discriminatory system", but only graded the anomaly priority 3, as it could be due to either a bedrock conductor or to a change in overburden parameters. The overburden is basalt. The anomaly is further downgraded by the fact that it follows a topographic ridge. On the plus side, it is located to the side of a regional gravity low (possible granite cusp), which adds a bit of interest.

A strong VLF anomaly was detected (although the VLF was very noisy, possibly due to powerlines), which would fit in with a surficial source. Hence I have given the anomaly low priority. More detailed work should still be done at some stage however, to check for a bedrock conductor beneath conductive overburden. I suggest a small grid be put in: 3 x 1 km lines, 200m apart and bearing 090° (magnetic) and centred on 300W of the ground-check traverse. (I have not yet contacted any farmers in the area). The grid should be covered with max-min (200m coil spacing, 50m station spacing) and magnetics (10m station spacing - ground mag. detected a 1500 nT anomaly coincident with the VLF anomaly). IP should be done over the best max-min anomaly.

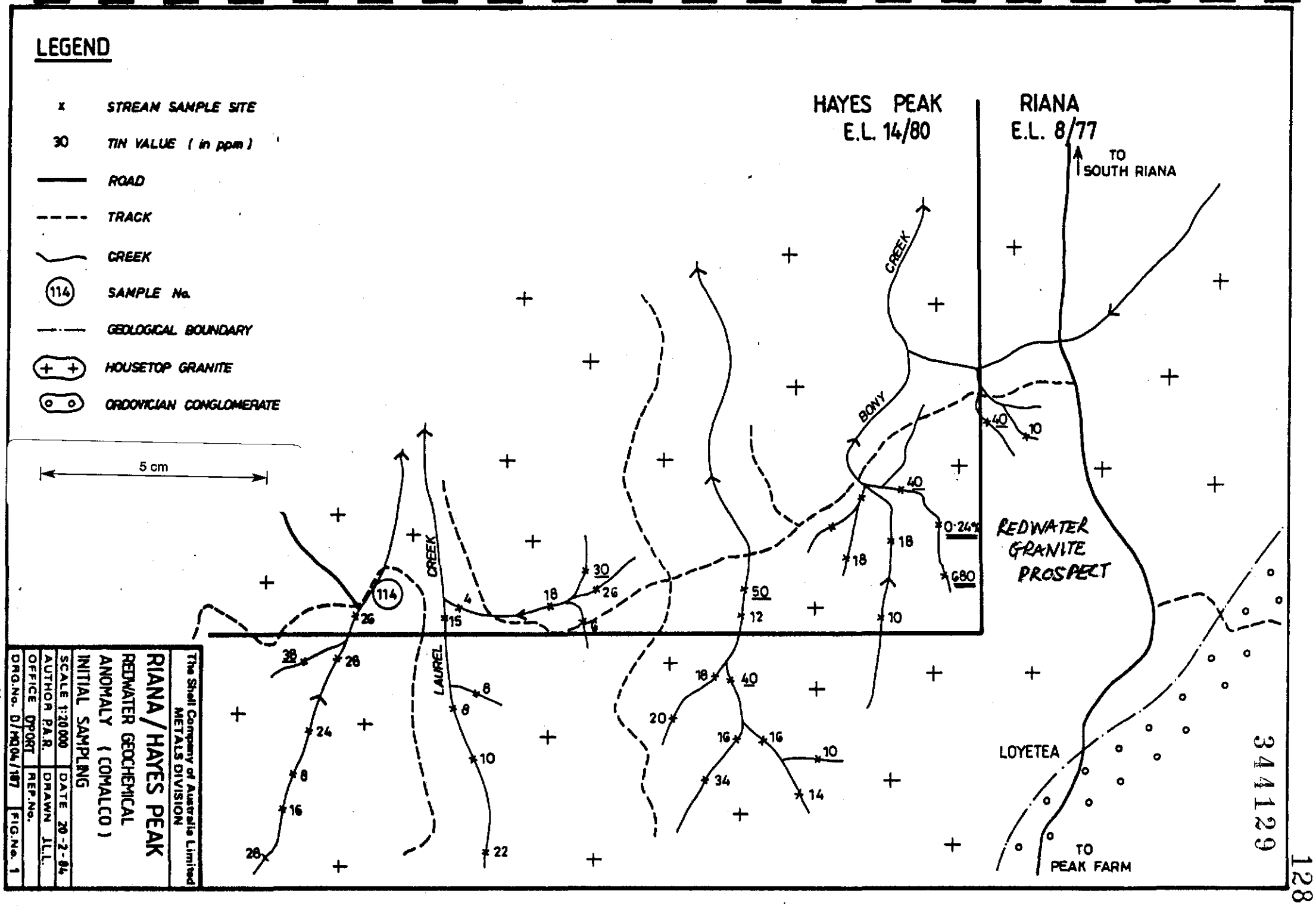
IR 5

The anomaly is almost certainly cultural:- there are several well-earthed fences in the vicinity (within 50m) of its plotted location. No further work is recommended.

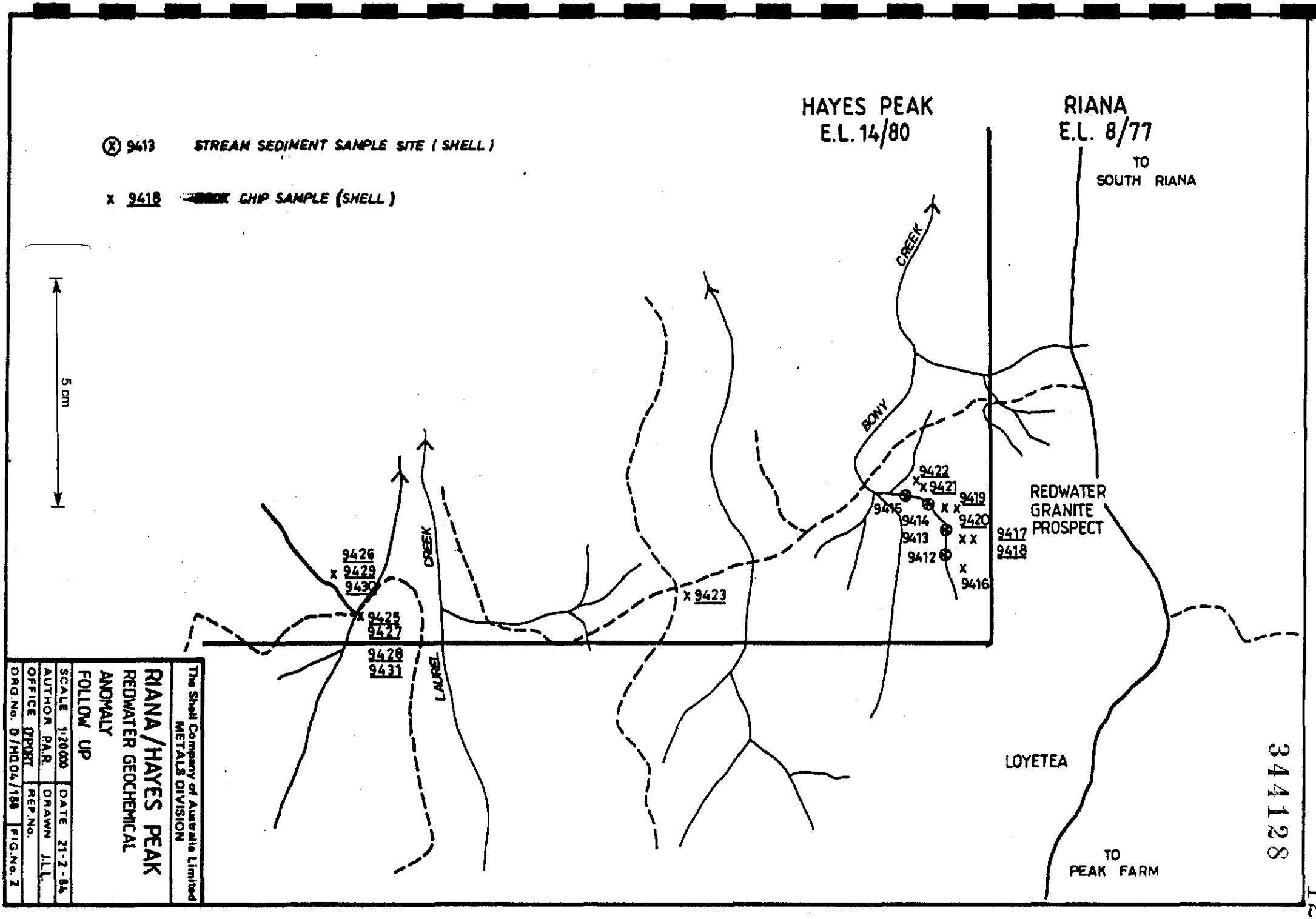
APPENDIX 7

REDWATER GRANITE ANOMALY

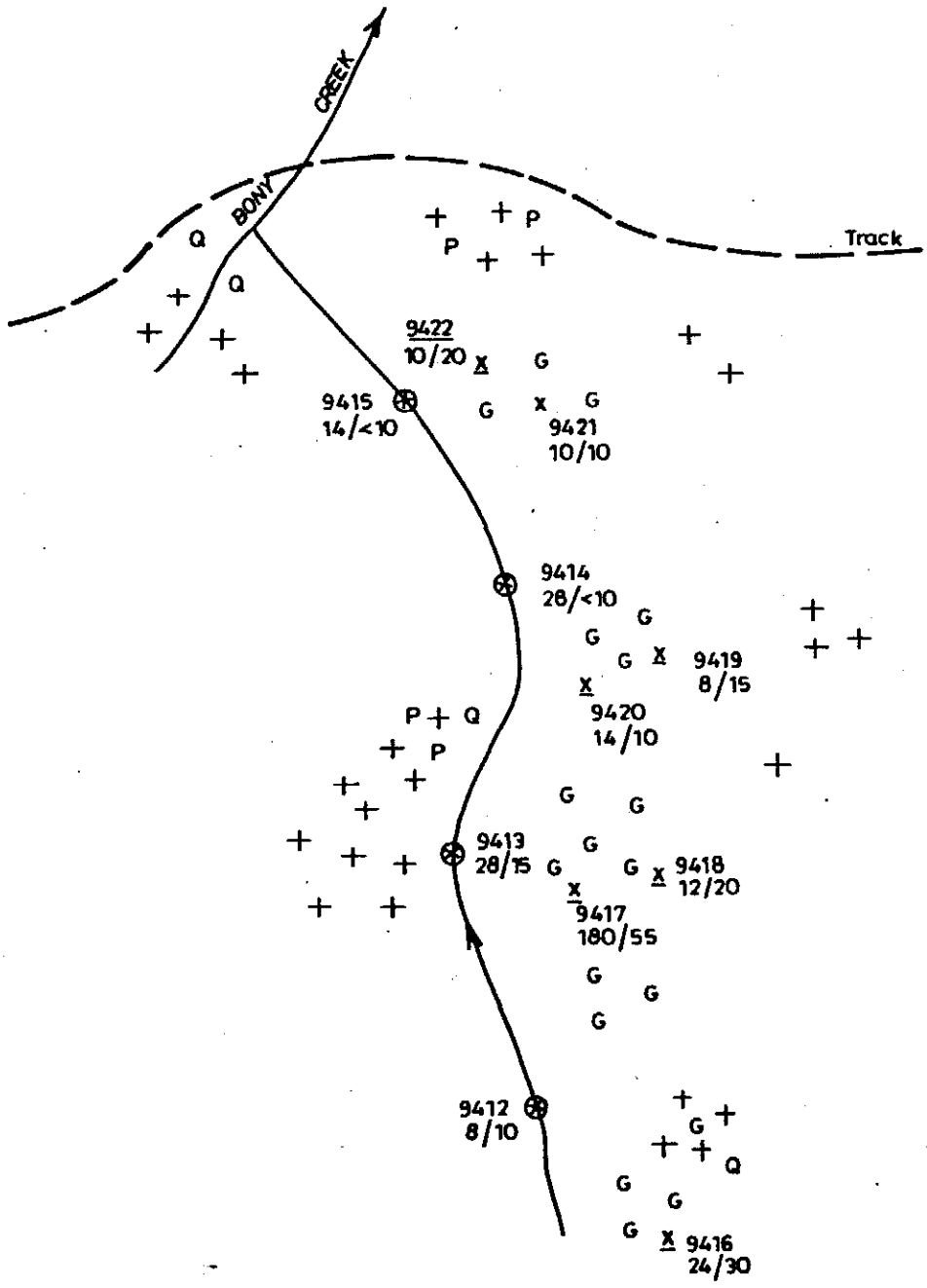
Stream Sediment Results


LEGEND
x STREAM SAMPLE SITE
30 TIN VALUE (in ppm)
ROAD
TRACK
CREEK
(114) SAMPLE No.
GEOLOGICAL BOUNDARY
HOUSETOP GRANITE
ORDOVICIAN CONGLOMERATE
5 cm
HAYES PEAK
E.L. 14/80
RIANA
E.L. 8/77
TO
SOUTH RIANA
CREEK
BONY
CREEK
LAUREL
REDWATER
GRANITE
PROSPECT
0·24%
680
LOYETEA
TO
PEAK FARM
114
26
38
28
24
8
16
28
4
15
18
30
26
6
6
8
10
22
18
50
12
10
18
18
18
40
40
10
18
40
20
16
16
10
34
14
The Shell Company of Australia Limited
METALS DIVISION
RIANA/HAYES PEAK
REDWATER GEOCHEMICAL
ANOMALY (COMALCO)
INITIAL SAMPLING
SCALE 1:20000
DATE 20-2-84
AUTHOR P.A.R.
DRAWN J.L.L.
OFFICE DPORT
REP.No.
DRG.No. D/PRO4/187
FIG.No. 1

344129


⊗ 9413 STREAM SEDIMENT SAMPLE SITE (SHELL)
x 9418 CHIP SAMPLE (SHELL)
5 cm
HAYES PEAK
E.L. 14/80
RIANA
E.L. 8/77
TO
SOUTH RIANA
CREEK
BONY
REDWATER
GRANITE
PROSPECT
9422
9421
9419
9420
9417
9418
9416
9415
9414
9413
9412
9426
9429
9430
9425
9427
9428
9431
9423
CREEK
LAUREL
LOYETEA
TO
PEAK FARM
344128
RIANA/HAYES PEAK
REDWATER GEOCHEMICAL
ANOMALY
FOLLOW UP
The Shell Company of Australia Limited
METALS DIVISION
SCALE 1:20000
DATE 21-2-84
AUTHOR P.A.R.
DRAWN J.L.L.
OFFICE OPORT
REP.No.
DRG.No. D/HC04/188
FIG.No. 2

344130



LEGEND

⊗	STREAM SAMPLES
X	ROCK SAMPLES
20/150	ppm. Sn / ppm WO_3
9415	SAMPLE NUMBER
+	MEDIUM GRAINED EQUIGRANULAR BIOTITE GRANITE
P	FINE GRAINED PORPHYRITIC GRANITE
G	GREISENIZED GRANITE
Q	QUARTZ VEIN/GREISEN

0 — 100 m

SWAMPY AREA
Possible alluvial buildup

5 cm

The Shell Company of Australia Limited
METALS DIVISION

RIANA / HAYES PEAK
REDWATER GRANITE PROSPECT
GEOLOGY/GEOCHEMISTRY

SCALE AS SHOWN	DATE 21-2-84
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG.No. D/MQ04/189	FIG.No. 3

130

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.

ANALYTICAL REPORT

344131

JOB COM831810 O/N : 4187/MQ04/PAR/99

Results in ppm

SAMPLE		Sn	WO3	Mo	Bi	As
Meuter Granite prospect 9412	S/S	8	10	<4	4	<2
9413		28	15	<4	<4	<2
9414		28	<10	<4	<4	<2
9415		14	<10	<4	6	<2
9416	lode	24	30	<4	6	<2
9417		180	55	<4	<4	<2
9418		12	20	<4	<4	<2
9419		14	10	<4	<4	2
9420		8	15	4	6	2
9421		10	10	<4	<4	2
9422		10	20	<4	<4	<2
9423		34	40	<4	<4	<2
114 sample site 9424	rock	10	15	<4	<4	<2
9425		55	25	<4	<4	<2
114 sample site Meuter area 9426	rock	30	70	4	10	<2
9427		14	10	<4	<4	<2
9428		44	35	10	4	<2
9429		32	30	<4	6	<2
9430		16	<10	<4	10	7
9431		12	20	<4	6	<2

131

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

This ... registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.

ANALYTICAL REPORT

344132

JOB COM831810 O/N : 4187/MQ04/PAR/99

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	Au
9412	8	<4	6	<1	<0.05
9413	10	6	8	<1	<0.05
9414	8	4	6	<1	<0.05
9415	6	<4	6	<1	<0.05
9416	12	6	10	<1	<0.05
9417	6	6	10	<1	<0.05
9418	12	6	12	<1	<0.05
9419	8	6	18	<1	<0.05
9420	10	10	12	<1	<0.05
9421	6	8	28	<1	<0.05
9422	8	8	14	<1	<0.05
9423	8	8	10	<1	<0.05
9424	8	100	10	<1	<0.05
9425	10	170	260	<1	<0.05
9426	10	190	330	<1	<0.05
9427	6	28	50	<1	<0.05
9428	12	690	560	2	<0.05
9429	22	350	220	2	<0.05
9430	8	250	170	1	<0.05
9431	18	14	16	<1	<0.05

MICROFILMED

344133

OPEN FILE
LIST OF PLANS
D. of M. | A.O. | C.G. | E.O. | D.S.I. | Registrar | D. DIR. | E & IL
2 5 SEP 1984
DEPT. OF MINES
REP. No. 9835/84

Plan No.	Title	Scale
D/MQ 04/104R ✓	RIANA E.L. 8/77 & HAYES PEAK E.L. 14/80 Geology - Relinquished Ground	1:50 000
D/MQ 04/174R	RIANA E.L. 8/77 & HAYES PEAK E.L. 14/80 Grid Location Map - Relinquished Ground	1:50 000
D/MQ 04/080R	RIANA E.L. 8/77 Airborne Magnetic Survey with Anomaly Numbers - Relinquished Ground	1:63 360
D/MQ 04/164R	RIANA E.L. 8/77 & HAYES PEAK E.L. 14/80 Anomaly Map - Relinquished Ground	1:50 000
D/MQ 04/082 ✓	RIANA E.L. 8/77 Reconnaissance Ground Magnetics Midgley Falls (4144/3)	1:2 500
D/MQ 04/077 ✓	RIANA E.L. 8/77 Reconnaissance Ground Magnetics Stotts Road (4143/3)	1:2 500
D/MQ 04/139	RIANA E.L. 8/77 Initial Ground Check INPUT Anomaly IR 1 Knob Park	1:2 500

APPENDIX 1

D/MQ 04/053	RIANA E.L. 8/77 Redwater Prospect. Geology & Drillhole Locations	1:2 500
D/MQ 04/014	RIANA E.L. 8/77 Redwater Grid. Peak Hill Farm Section. Stacked Magnetic Profiles	1:2 500
D/MQ 04/036 ✓	RIANA E.L. 8/77 Redwater Prospect. Schematic Geological Cross-Sections along Line 6100N	1:1 000
D/MQ 04/035A ✓	RIANA E.L. 8/77 Redwater Prospect. Line 6100N. Holes RED 3, RD 4 & 5. Geology.	1:500
D/MQ 04/035B	RIANA E.L. 8/77 Redwater Prospect. Line 6100N. Holes RED 3, RD 4 & 5 Geochemical Assays Sn, W	1:500
D/MQ 04/049	RIANA E.L. 8/77 Laurel Creek West. Soil Geochemistry Cu, Pb, Zn	1:2 500
D/MQ 04/050	RIANA E.L. 8/77 Laurel Creek West. Soil Geochemistry Sn, W	1:2 500
D/MQ 04/051	RIANA E.L. 8/77 Laurel Creek West. Soil Geochemistry Ni, Fe	1:2 500
D/MQ 04/043	RIANA E.L. 8/77 Laurel Creek West. Total Field Magnetic Contours	1:2 500

Plans Cont.

APPENDIX 2

Plan No.	Title	Scale
D/MQ 04/045	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Soil Geochemistry Ni, Fe	1:2 500
D/MQ 04/046	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Soil Geochemistry Sn, W	1:2 500
D/MQ 04/047	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Soil geochemistry Cu, Pb, Zn	1:2 500
D/MQ 04/054	RIANA E.L. 8/77 Loyetea Prospect Western Portion Soil Geochemistry Sn, W	1:2 500
D/MQ 04/055	RIANA E.L. 8/77 Loyetea Prospect Western Portion Soil Geochemistry Cu, Pb, Zn	1:2 500
D/MQ 04/056	RIANA E.L. 8/77 Loyetea Prospect Western Portion Soil Geochemistry Ni, Fe	1:2 500
D/MQ 04/037	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Ground Magnetic Values	1:2 500
D/MQ 04/039	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Stacked Magnetic Profiles	1:2 500
D/MQ 04/042	RIANA E.L. 8/77 Loyetea Prospect Western Portion Ground Magnetics	1:2 500
D/MQ 04/048	RIANA E.L. 8/77 Loyetea Prospect Western Portion Magnetic Profiles	1:2 500
D/MQ 04/070	RIANA E.L. 8/77 Loyetea Prospect Eastern Portion Stacked Magnetic Profiles 2900E, 3000E & 3100E	1:2 500
D/MQ 04/071	RIANA E.L. 8/77 Loyetea Prospect Western Portion Stacked Magnetic Profiles 1500E, 1600E & 1700E	1:2 500

APPENDIX 3

D/MQ 04/072	RIANA E.L. 8/77 Redwater North Prospect. Ground Magnetic Profiles	1:2 500

410 000 E

420 000 E

BASS
STRAIT

344135

The Shell Company of Australia Limited
METALS DIVISION

GEOLOGY OF :
E.L. 8/77 RIANA
E.L. 14/80 HAYES PEAK (R)

945

84-2216 vol 2

SCALE	1:50 000	DATE	11-7-83
AUTHOR	P. RUXTON	DRAWN	H.L.H.
OFFICE	DEVONPORT	REP. No.	
ENCL No.		DRG No.	D/MQ04/104

5 cm

5 450 000 N

5 440 000 N

5 430 000 N

5 420 000 N

SULPHUR CREEK
STOWPORT
CUPRONA
PENGUIN
BASS HIGHWAY
CAMENA
E.L. 8/77
RIANA
UPPER NATONE
SOUTH RIANA
E.L. 14/80
To Hampshire
To Ulverstone
GUNNS PLAINS
To Sprent
CENTRAL CASTRA
To Upper Castra
To South Nietta
LOYETEA
CASTRA 414/14

LEGEND

TERTIARY
- Tertiary/Recent cover
- Basalt/Volcanics

DEVONIAN
- Housetop Granite

SILURIAN
- Eldon Group

ORDOVICIAN
- Limestone
- Sandstone
- Conglomerate
- Ironstone

CAMBRIAN
- Volcanics/Volcanoclastics

PRECAMBRIAN
- Burnie Formation - Sandstones/Shales/Dolerites
- Magnetic Skarn

KEY
- Roads
- Rivers & creeks
- Geological boundaries
- Fault

SCALE	1 : 50000
DATE	30-8-83
AUTHOR	P RUXTON
DRAWN	H.L.H
OFFICE	DEVONPORT
REP No.	
DRG No.	D/M004/172
ENCL No.	

The Shell Company of Australia Limited
METALS DIVISION

GEOLOGY OF :
E.L. 8/77 RIANA
E.L. 14/80 HAYES PEAK
GRID LOCATION MAP (R)

946

344136

5 cm

LEGEND

- Tertiary/Recent cover
- Basalt/volcanics
- DEVONIAN — Housetop Granite
- SILURIAN — Eldon Group
- ORDOVICIAN — Limestone, Sandstone, Conglomerate, Ironstone
- CAMBRIAN — Volcanics/Volcaniclastics
- PRECAMBRIAN — Burnie Formation - Sandstones/Shales/Dolerites
- Magnetic Skarn
- Gridded Area
- Grid Lines

KEY

- Roads
- Rivers & creeks
- Geological boundaries
- Fault

BASS STRAIT

PENGUIN

SULPHUR CREEK

CUPRONA

STOWPORT

UPPER STOWPORT

CAMENA

MIDGLEY FALLS

STOTTS ROAD

E.L. 8/77

RIANA

SOUTH RIANA

WATTLE GROVE

UPPER NATONE

E.L. 14/80

GUNNS PLAINS

CENTRAL CASTRA

To Sprent

To Upper Castra

To Ulverstone

To South Nietta

To Hampshire

LOYETEA GRID

REDWATER NORTH

REDWATER GRID

LOYETEA

HOUSETOP

LAUREL WEST GRID

LOYETEA SOUTH (ZAE)

420 000 E

410 000 E

5 450 000 N

5 440 000 N

5 430 000 N

5 420 000 N

946

4244/3
(DIAL POINT)

4244/1
(PENGUIN)

4244/2
(NEPTUNE)

4144/2
(CAMENA)

4144/2

4144/3
(MIDGLEY FALLS)

4143/3
(STOTTS ROAD)

4043/3
(ELLIS CREEK N)

4043/2
(ELLIS CREEK SOUTH)

4143/2
(WATTLE GROVE)

4143/4
(SOUTH RIANA)

4143/1

4142/11

4142/3
(LOWANA CREEK)

4142/2
(LOYETEA EAST)

4042/2
(HOUSETOP)

4142/9

(PEAK HILL)

4142/1
(REDWATER)

CASTRA
4143/4

4042/1
(LAUREL CREEK
WEST)

T.N.

1 0 1 2 Miles

5 cm

344137

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA (R)
GEOMETRICS
AIRBORNE MAGNETICS SURVEY
WITH ANOMALY NUMBERS

84-2216 Scale : 1:63360 947

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/080
DATE 23-10-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT

410 000 E

420 000 E

TN

3 km
2
1
0

344138

The Shell Company of Australia Limited
METALS DIVISION

GEOLOGY OF :
E.L. 8/77 RIANA
E.L. 14/80 HAYES PEAK
ANOMALY MAP (R)

948

84-2216

SCALE 1: 50000	DATE 11-7-83
AUTHOR P RUXTON	DRAWN H L H
OFFICE DEVONPORT	REP No.
ENCL No.	DRG No. D/M004/164

BASS STRAIT

5 cm

5 450 000 N

5 440 000 N

5 430 000 N

5 420 000 N

SULPHUR CREEK

4244/3 DIAL POINT

PENGUIN

PENGUIN 4244/1

NEPTUNE 4244/2

PENGUIN WO3

BASS HIGHWAY

STOWPORT

CUPRONA

RIVER

CREEK

IR 6

I.R. 2

DEAR CREEK 4044/3

UPPER STOWPORT 4044/2

IR 4

IR 1

4144/2 CAMENA

CAMENA 4144/2

MIDGLEY FALLS 4144/3

IR 11

IR 5

IR 10

STOTTS ROAD 4143/3

GL 11

ELLIS CREEK NORTH 4043/2

ELLIS CREEK SOUTH 4043/1

E.L. 8/77

RIANA

UPPER NATONE

WATTLE GROVE 4143/2

SOUTH RIANA 4143/4

SOUTH RIANA

E.L. 14/80

4143/1

To Hampshire

To Ulverstone

To Sprent

CENTRAL CASTRA

To Upper Castra

To South Nietta

GUNNS PLAINS

LOWANA CREEK 4142/3

4142/16

4142/15

REDWATER GRANITE
Sn/WO3

LOYETEA WEST 4142/11

4142/2 LOYETEA EAST

4142/1 REDWATER NORTH

HOUSETOP 4042/2

LOYETEA

REDWATER 4142/1

PEAK HILL 4142/12

PEAK HILL FARM 4142/12

LAUREL CREEK WEST 4042/1

CASTRA 4142/4

LEVEN

BLYTHE

LAUREL

LEGEND

Tertiary/Recent cover

TERTIARY

Basalt/Volcanics

DEVONIAN

Housetop Granite

SILURIAN

Eldon Group

ORDOVICIAN

Limestone

Sandstone

Conglomerate

Ironstone

CAMBRIAN

Volcanics/Volcanoclastics

PRECAMBRIAN

Burnie Formation - Sandstones/Shales/Dolerites

Magnetic Skarn

Gravity Lows

Aeromagnetic Anomalies

Input Anomalies

Stream Sediment Anomalies

KEY

Roads

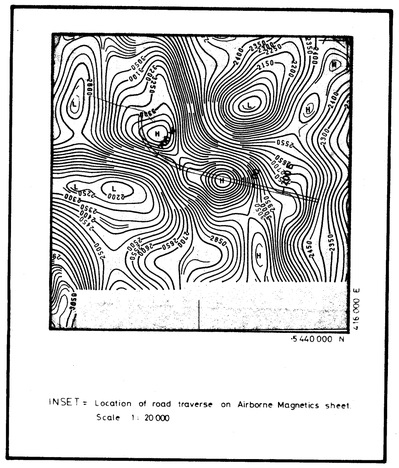
Rivers & creeks

Geological boundaries

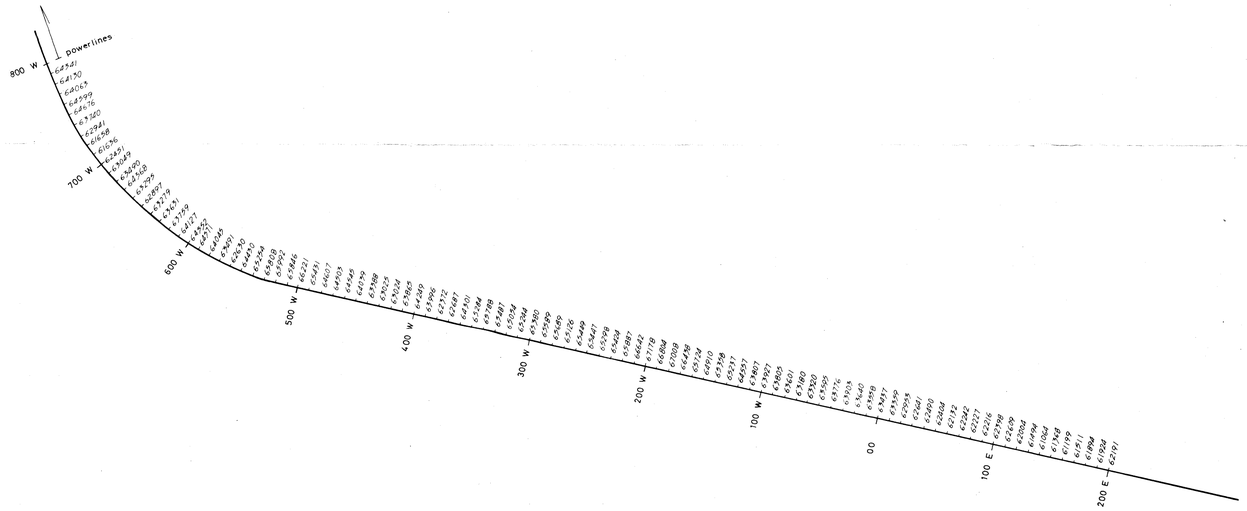
Fault

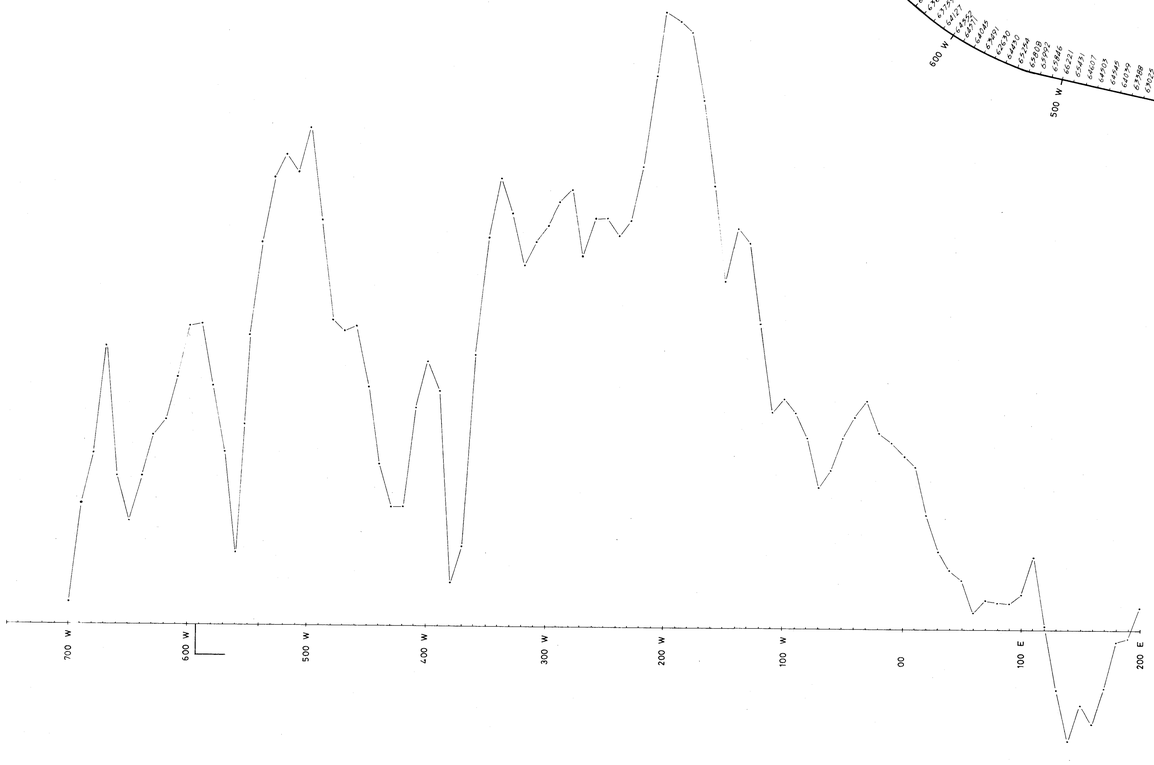
47

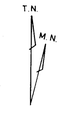
84b



INSET = Location of road traverse on Airborne Magnetics sheet
Scale 1: 20 000







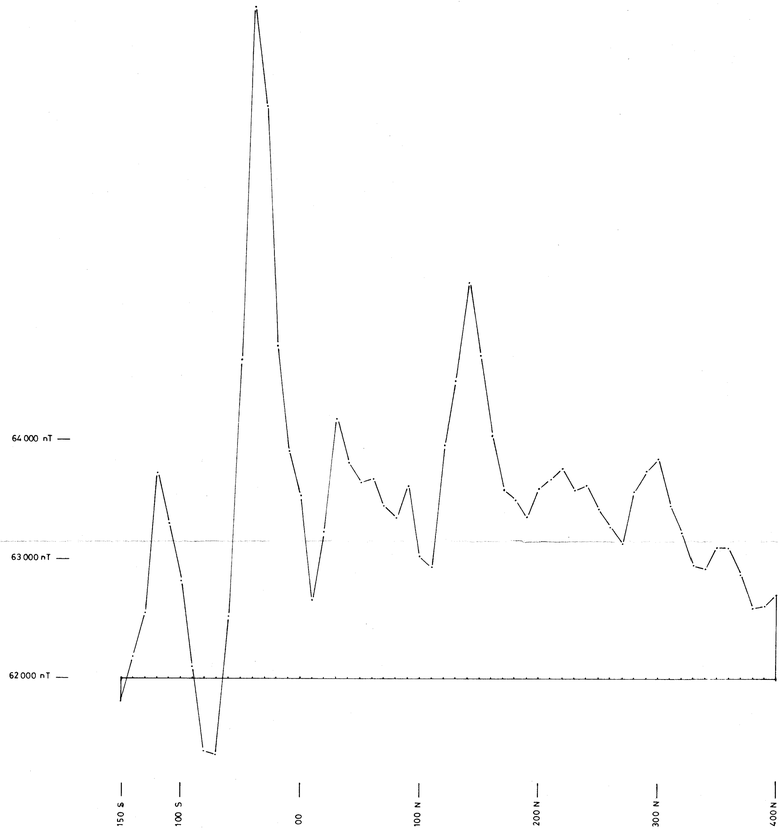
5 cm

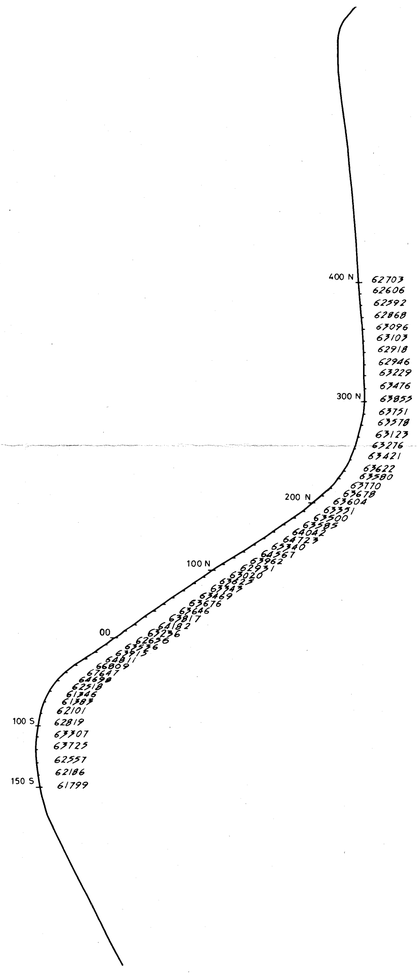
N.B.
Outcropping rock type along traverse is Tertiary basalt, with a magnetic susceptibility of 100 - 300 x 10^{-6} c.g.s. units.

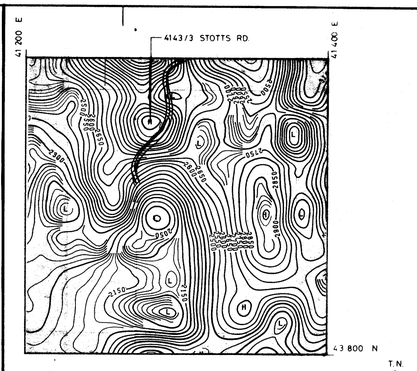
344139

0 100 200M

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA Initial Reconnaissance of Ground Magnetic Anomaly 4144/3 Midgley Falls.	943
BH-2216 Scale 1: 2500	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/082
DATE 14-12-81	AUTHOR L.D. BANWELL
DRAWN H. L. H.	OFFICE DEVONPORT







INSET = LOCATION OF ROAD TRAVERSE ON AIRBORNE MAGNETICS SURVEY

SCALE = 1: 20 000

T.N.

NOTE:

ALONG TRAVERSE OUTCROPPING ROCK TYPE IS TERTIARY BASALT WITH A MAGNETIC SUSCEPTIBILITY OF 400 – 1000 X 10^{-6} c.g.s. UNITS.

344140

0 100 200 M

5 cm

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA INITIAL GROUND RECONNAISSANCE OF MAGNETIC ANOMALY 4143/3 STOTTS ROAD	
84-22-16 Scale : 1: 2500	950
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/077
DATE 1-10-81	AUTHOR L.D. BANWELL.
DRAWN H.L.H.	OFFICE DEVONPORT.

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
INPUT ANOMALY 4144/IR1
INITIAL GROUND CHECK

951

84-2216

SCALE	1: 2500	DATE	15-10-82
AUTHOR	G. OAKES	DRAWN	H.L.S.
OFFICE	DEVONPORT	REP. No.	
ENCL. No.		DRG. No.	D/MQ04/139

200 M
100
0

5 cm

344111

V.L.F.–EM

· · · · N.W. Cape (+ve dip to N)
x — x Japan (+ve dip to E)

500 W 400 W 300 W 200 W 100 W 00

DIP: 10° 0 -10° -20° -30°

LEVEL: 200% 180% 160% 140% 120% 100%

N.B. Japan very noisy

conductive zone

MAGNETICS

63000nT
62000nT
61000nT

APPROX. TOPOGRAPHY & CULTURE (Metres A.S.L.)

N.B. Line along road with fences (not grounded) & powerlines

230
220
210

fences
track junction
sheds

INPUT LINE 1241

CHANNEL 6
CHANNEL 5
CHANNEL 4
CHANNEL 3
CHANNEL 2
CHANNEL 1

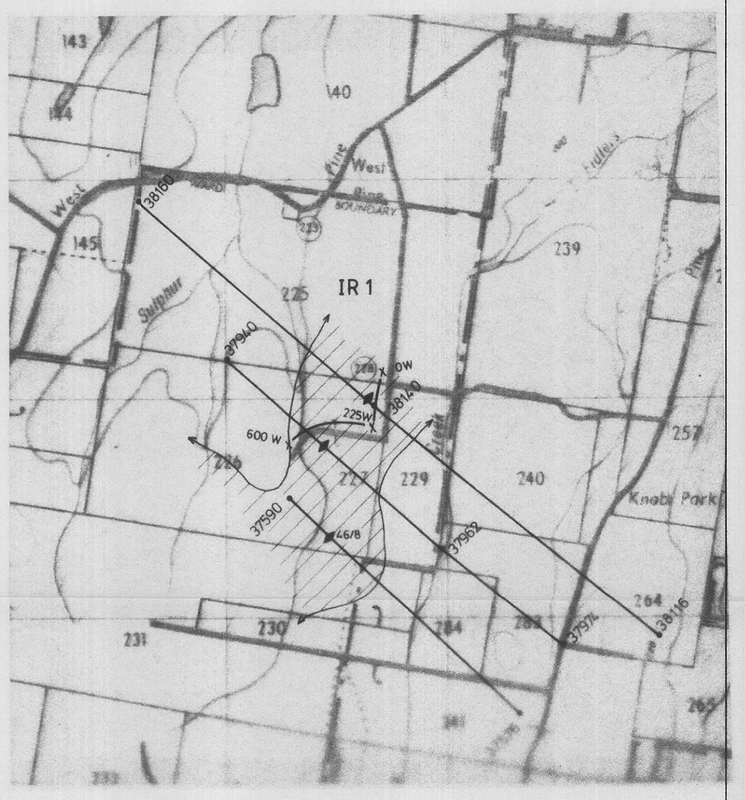
ALTITUDE

MAGNETICS

N.W. — 37950 — IR1 — 37980 — S.E.

415000 E 416000 E

5444000 N
5443000 N
5442000 N



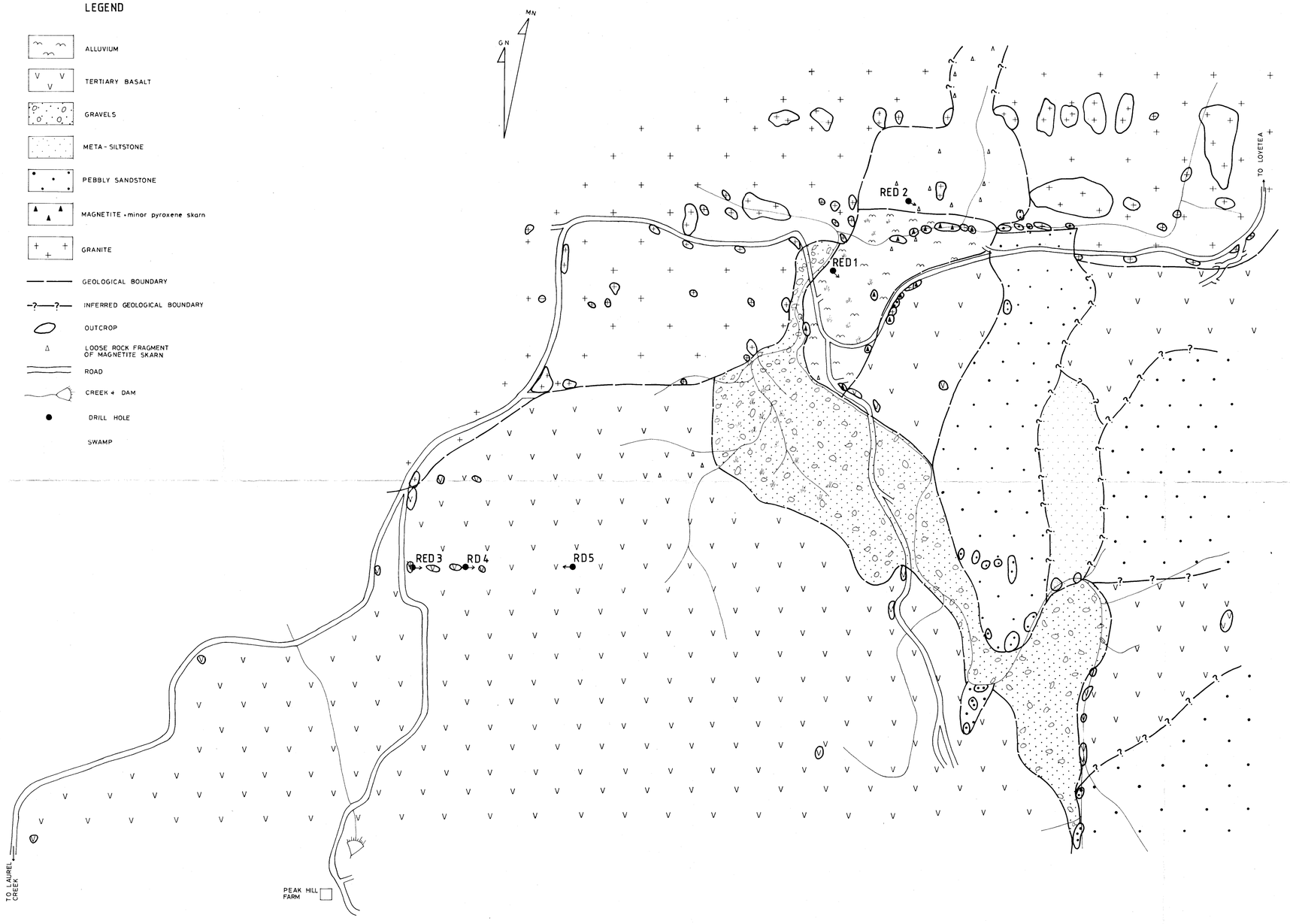
LOCATION ON CADASTRAL 20/4144

SCALE 1: 20000
INPUT flight lines & fiducials
X — X Ground recce lines
Location of INPUT anomaly

961

LEGEND

- ALLUVIUM
- TERTIARY BASALT
- GRAVELS
- META - SILTSTONE
- PEBBLY SANDSTONE
- MAGNETITE + minor pyroxene skarn
- GRANITE
- GEOLOGICAL BOUNDARY
- INFERRED GEOLOGICAL BOUNDARY
- OUTCROP
- LOOSE ROCK FRAGMENT OF MAGNETITE SKARN
- ROAD
- CREEK + DAM
- DRILL HOLE
- SWAMP



6600 N
6500 N
6400 N
6300 N
6200 N
6100 N
6000 N
5900 N
5800 N

10000 E
10100 E
10200 E
10300 E
10400 E
10500 E
10600 E
10700 E
10800 E
10900 E
11000 E
11100 E
11200 E
11300 E
11400 E

344142

5 cm

0 100 200M

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
REDWATER PROSPECT
GEOLOGY & DRILL HOLE LOCATIONS
ANOMALY 4142/1

84-2216 Scale 1:2500 952

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/053
DATE 19-6-81	AUTHOR T. WAITE
DRAWN H.L.H.	OFFICE DEVONPORT

11100m
11000m
10900m
10800m
10700m
10600m
10500m
10400m
10300m
10200m
10100m
10000m
9900m
9800m

64000nT
63000nT
62000nT
LINE 5700N 61000nT
LINE 5600N 61000nT
LINE 5500N 61000nT
LINE 5400N 61000nT
LINE 5300N 61000nT
LINE 5200N 61000nT
LINE 5100N 61000nT
LINE 5000N 61000nT

1cm = 500nT
0
100 M
200 M

344143

5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
ANOMALY 4142/1
PEAK HILL FARM SECTION
REDWATER GRID
STACKED MAGNETICS PROFILE

84-2216 Scale : 1:2500 953

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ 04/014
DATE 20-3-81	AUTHOR
DRAWN O. HEDDITCH	OFFICE DEVONPORT

1:1000

Tertiary basalt cover plus dykes & feeder channels

Deep lead sediments

Granite

Garnet - diopside skarn

Magnetite skarn

Limestone

RD5

RD4

RED 3

E

F

345.6M

203.6M

10.1M

10850
10800
10750
10700
10650
10600
10550
10500
10450
10400

1000nT

61 000nT

MAGNETICS

8MS

4MS

CHARGEABILITY

1000
700
500
400
300
200µ.M
100
70
50
40

200µ.M

RESISTIVITY

344144

5 cm

0 50M

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA REDWATER PROSPECT Schematic Geological Cross Section & Geophysics Along Line 6100 N	954
84-2216 Scale 1:1000 Horizontal	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/036
DATE 12-5-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT

RL 440

10650

10600

10550

10500

10450

RL 440

RD5

RD4

RED 3

Tertiary basalt

Tertiary deep lead deposits

Tertiary paleosoil

Unconformity surface

Ordovician limestone: in places extensively recrystalized, contains some silty material. Discolored troughout is calcareous silty cave fill.

Ordovician limestone extensively recrystalized in places with abundant calcareous clayey cave fill.

Garnet-diopside skarn-moderately altered to clay minerals

Garnet-diopside and magnetite skarn extensively altered to clay minerals.

Granite-quartz orthoclase biotite plagioclase-clayminerals

Altered granite- quartz muscovite-feldspar gneiss

Sheared altered granite

Granite- quartz-orthoclase-biotite-plagioclase

203.6M

Garnet-diopside skarn often sheared & brecciated with abundant secondary calcite veining

Cross-cut by Tertiary basalt dykes+feeder channels

Extensively recrystalized limestone with abundant secondary calcite + pyrite veining.

345.4M

Granite

Recrystalized limestone

10+1M

0 20M

344145

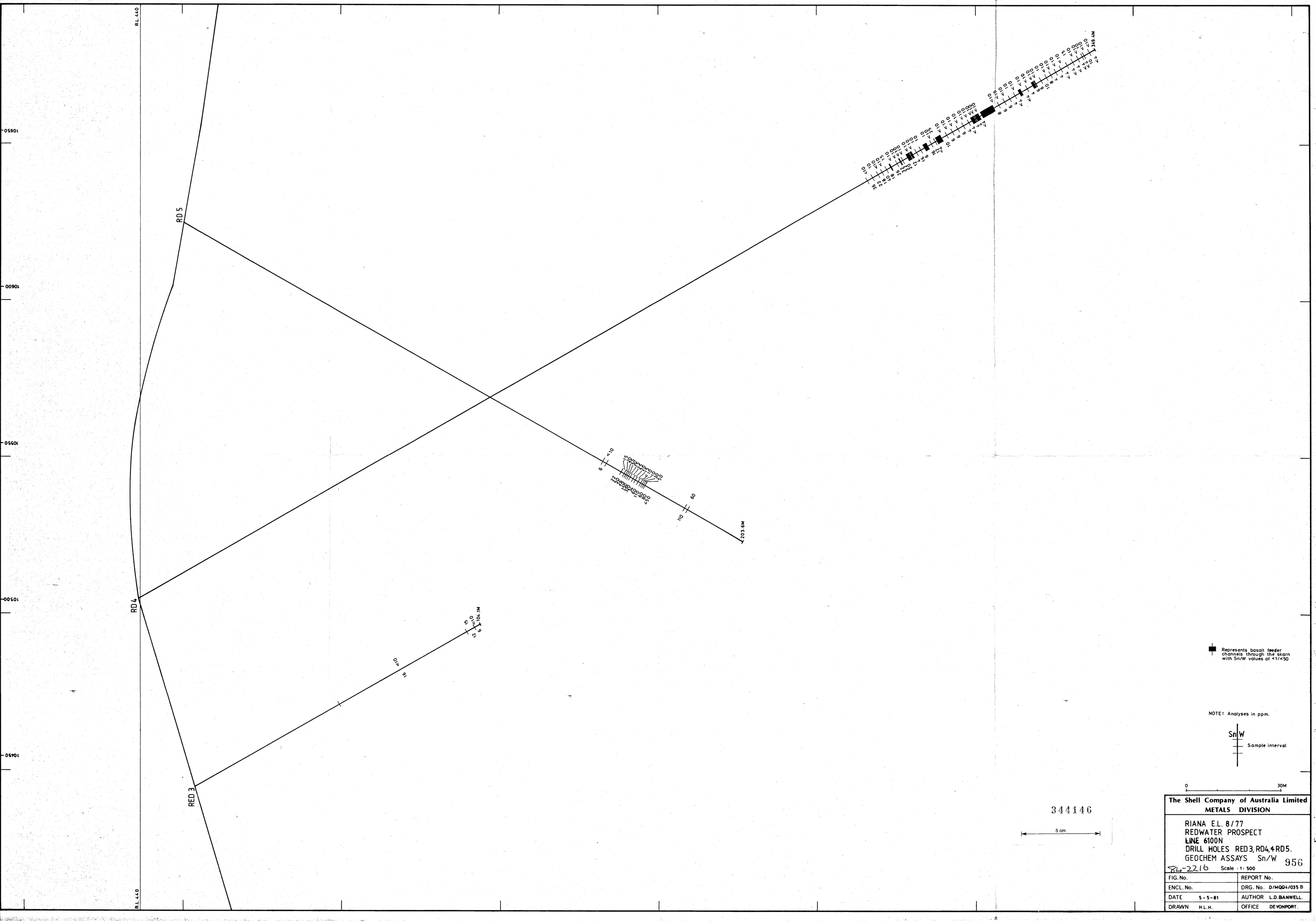
5 cm

The Shell Company of Australia Limited
METALS DIVISION

RIANA E.L. 8/77
REDWATER PROSPECT
LINE 6100N
DRILL HOLES RED3, RD4, RD5.
ANOMALY 4142/1

84-2216 Scale 1:500 955

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/035 A
DATE 5-5-81	AUTHOR L.D.BANWELL.
DRAWN H.L.H.	OFFICE DEVONPORT.

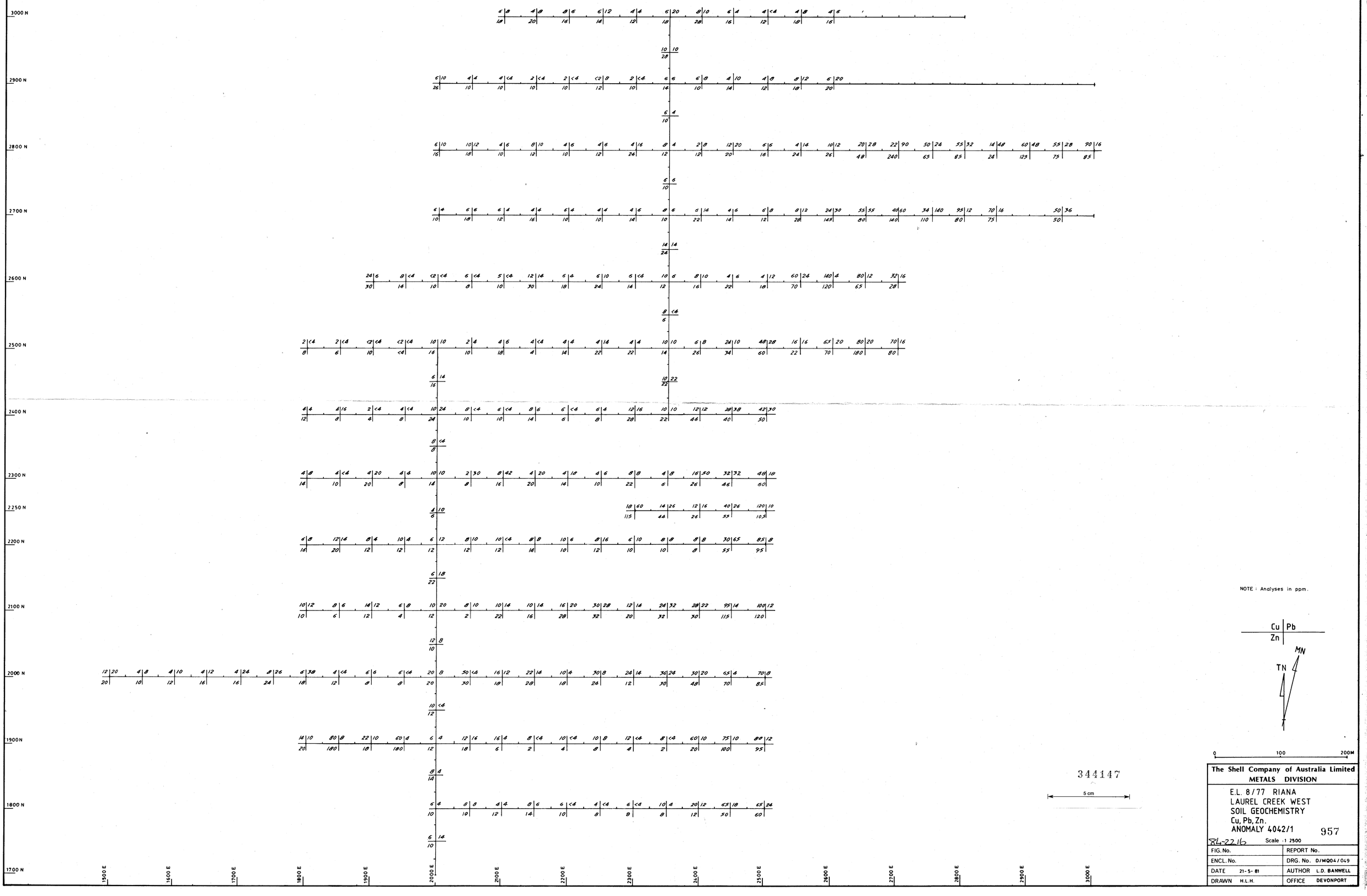


The Shell Company of Australia Limited
METALS DIVISION

RIANA E.L. 8/77
REDWATER PROSPECT
LINE 6100N
DRILL HOLES RED3, RD4, + RD5.
GEOCHEM ASSAYS Sn/W 956

RL-2216 Scale : 1:500

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/035 B
DATE 5-5-81	AUTHOR L.D.BANWELL.
DRAWN H.L.H.	OFFICE DEVONPORT.



NOTE : Analyses in ppm.

Cu | Pb
Zn

MN
TN

0 100 200M

344147

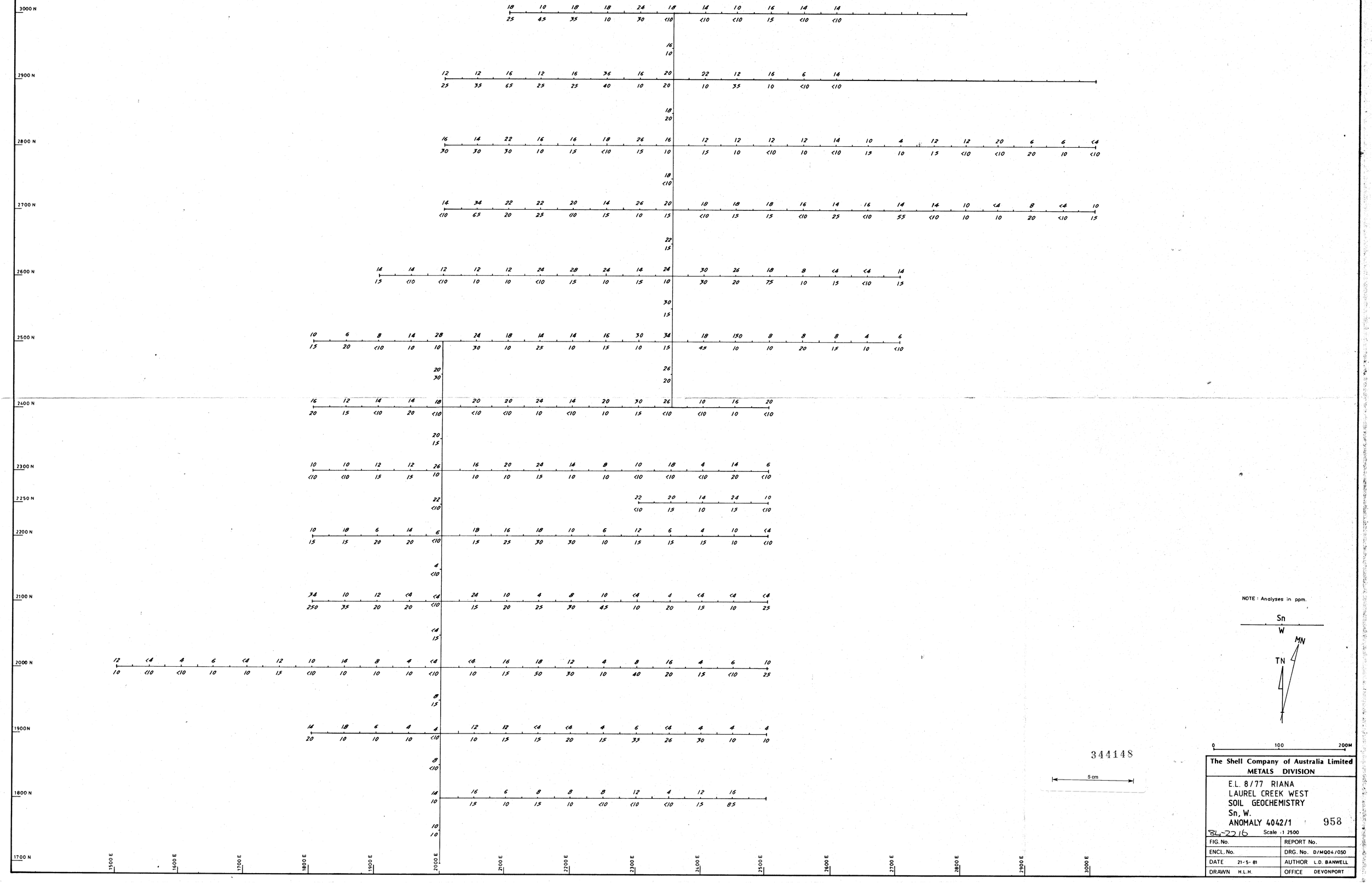
5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
LAUREL CREEK WEST
SOIL GEOCHEMISTRY
Cu, Pb, Zn.
ANOMALY 4042/1 957

SL-22-16 Scale :1 2500

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/049
DATE 21-5-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT



NOTE : Analyses in ppm.

0 100 200M

344148

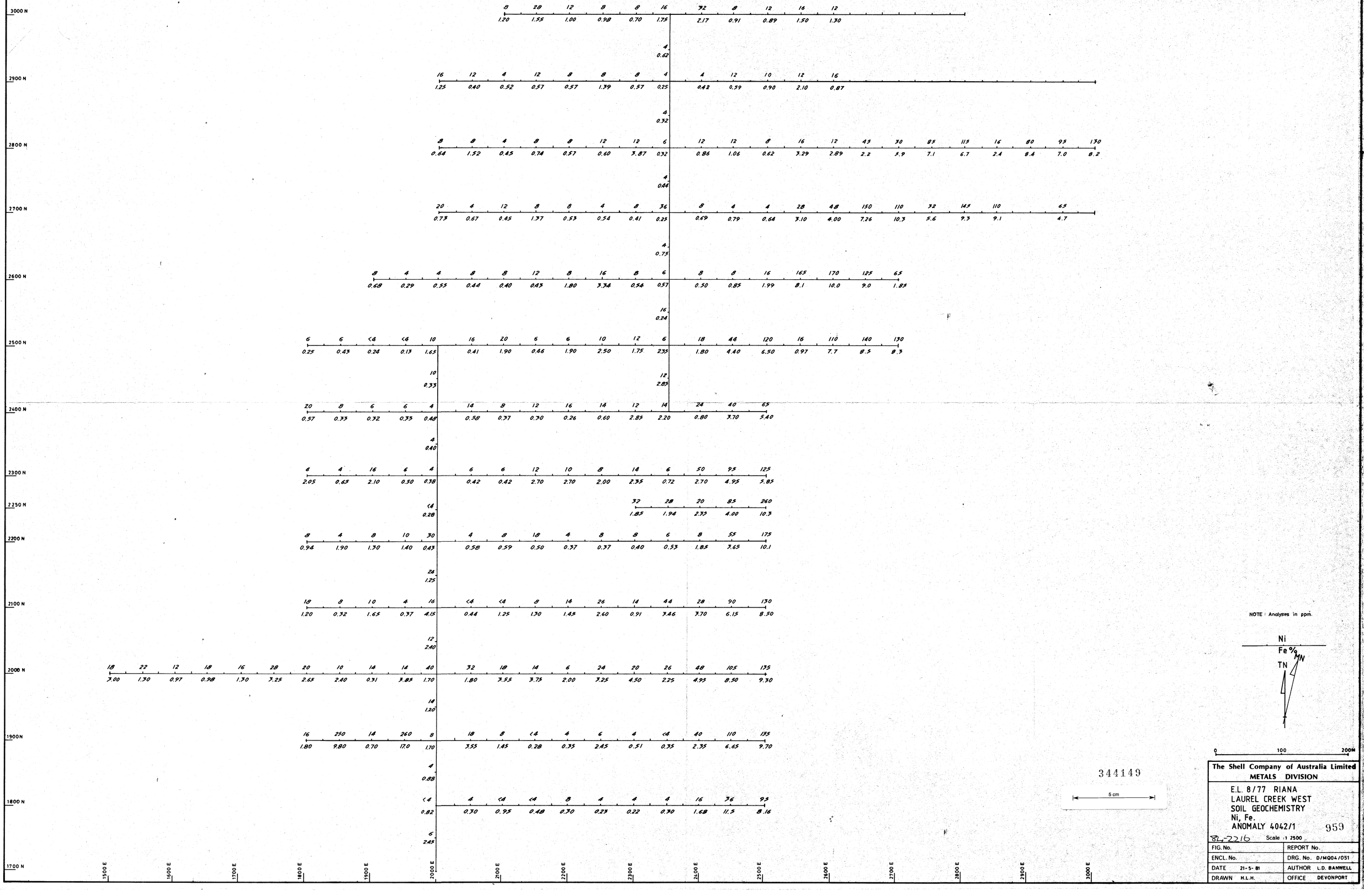
5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
LAUREL CREEK WEST
SOIL GEOCHEMISTRY
Sn, W.
ANOMALY 4042/1 958

84-2216 Scale 1:2500

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/050
DATE 21-5-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT



NOTE : Analyses in ppm.

0 100 200M

344149

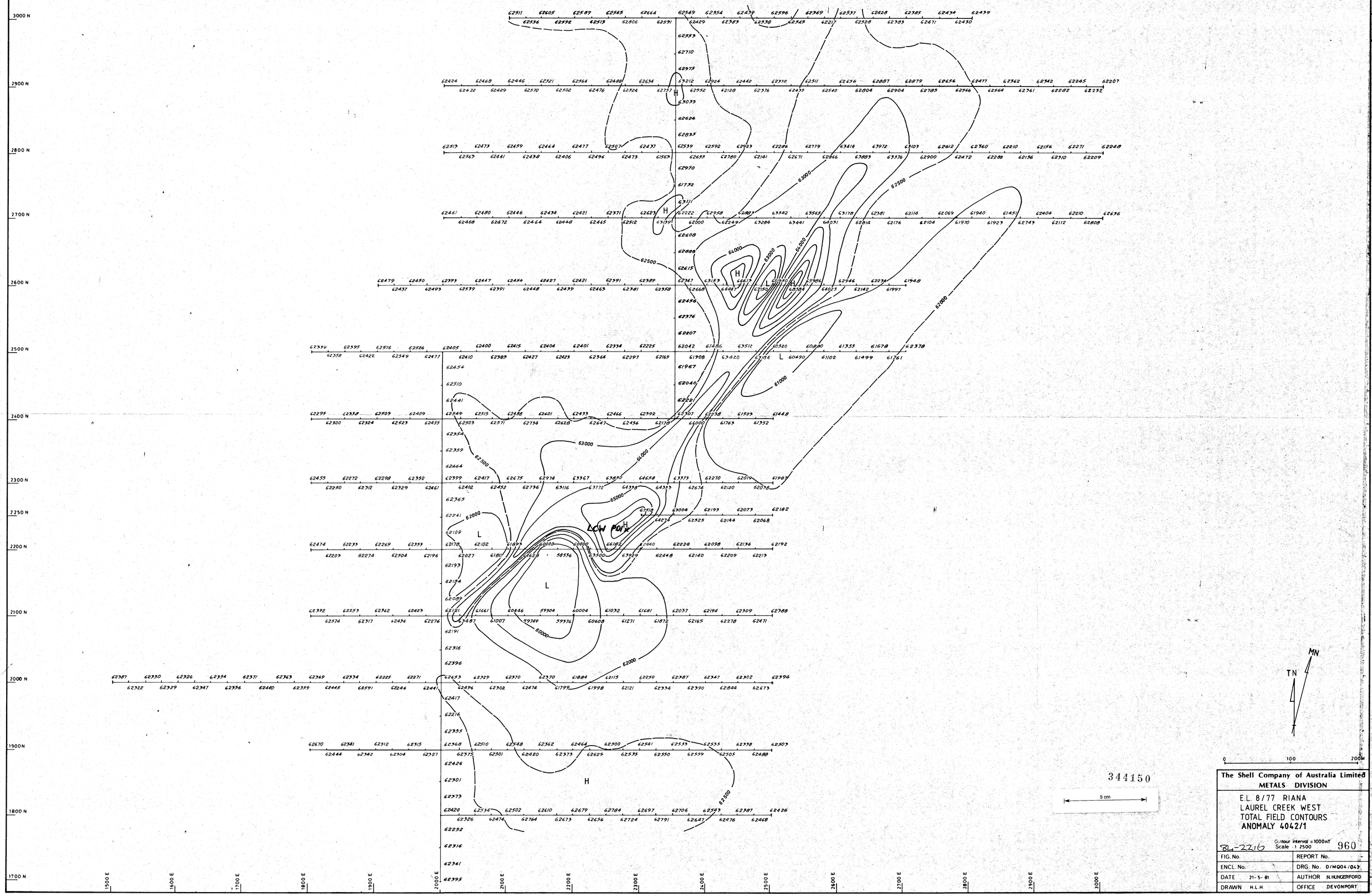
5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
LAUREL CREEK WEST
SOIL GEOCHEMISTRY
Ni, Fe.
ANOMALY 4042/1 959

84-2216 Scale 1:2500

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/051
DATE 21-5-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT



344150

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA LAUREL CREEK WEST TOTAL FIELD CONTOURS ANOMALY 4042/1	
8L-2216 Contour interval = 1000nT Scale 1:2500 960	
FIG. No.	REPORT No. -
ENCL. No.	DRG. No. D/MQ04/043
DATE 21-5-81	AUTHOR N.HUNGERFORD
DRAWN H.L.H.	OFFICE DEVONPORT

7000N 7100N 7200N 7300N 7400N 7500N 7600N 7700N 7800N 7900N 8000N 8100N 8300N 8400N 8500N 8600N 8700N 8800N 8900N 9000N

2400E
110 90 40 145 140 250 170 135 290 175 85 195 200 190 125 135 160 260 155 105 220 230 30 76 30 28 28 32 24 18 26
10.3 8.3 10.0 11.0 10.5 10.9 11.0 9.9 11.3 11.0 11.3 9.7 9.0 8.3 7.7 10.3 9.0 8.3 7.9 5.3 11.0 9.4 3.4 7.7 6.3 4.9 5.6 5.8 6.7 6.6 5.1
2400E

2600E
80 400 125 275 220 180 90 290 75 165 210 270 180 205 100 85 105 170 220 170 38 18 60 20 26 28 24 20 6 20 55 28 16 14 36 40 42
4.4 11.5 11.0 8.1 8.1 8.2 7.0 7.8 10.5 7.3 11.5 8.1 7.0 8.0 13.0 12.0 10.5 6.9 7.2 7.6 8.1 1.60 3.7 4.0 3.4 4.1 3.6 3.6 4.7 3.9 4.0 3.9 2.8 2.3 3.5 6.8 5.6
2600E

2800E
14 <4 6 250 145 135 150 75 170 200 145 155 165 185 215 170 180 175 175 200 24 14 48 38 25 26 14 28 24 70 18 18 24 10 14 30 24
0.70 0.35 0.30 11.0 11.0 10.5 10.5 10.0 10.5 10.5 10.0 10.0 10.0 12.5 11.5 9.2 10.5 10.0 11.0 11.0 2.7 2.9 9.2 7.2 7.3 6.9 6.8 3.9 5.1 3.2 3.4 6.2 5.6 4.3 3.2 6.7 5.3
2800E

3000E
8 18 10 44 80 80 280 255 75 <4 160 40 55 <4 100 4 46 83 80 42 70 18 50 6 4 14 10 24 26 14 24 80 44 105 40
0.40 0.50 2.2 3.9 5.4 3.8 9.2 8.2 8.3 7.1 6.4 5.9 6.4 6.6 7.8 0.75 6.5 7.4 6.7 2.3 7.4 7.9 6.7 4.5 5.9 7.8 7.8 6.9 6.8 4.3 4.2 6.7 8.5 1.45 3.3
3000E

3200E
10 42 100 150 260 185 200 200 150 130 55 165 205 150 260 300 215 60 24 30 32 10 24 28 40 20 14 18 14 28 4 10 12
1.50 3.7 4.7 6.7 7.7 7.9 7.6 7.0 4.9 9.6 2.8 6.0 8.1 6.1 7.1 8.9 9.3 3.1 1.90 2.6 0.66 0.45 1.45 2.3 3.9 2.1 2.7 5.0 2.8 3.4 0.75 0.95 1.10
3200E

8200N

NOTE : Analyses in ppm.

Ni
%Fe

NW NOMINAL

200M

344151

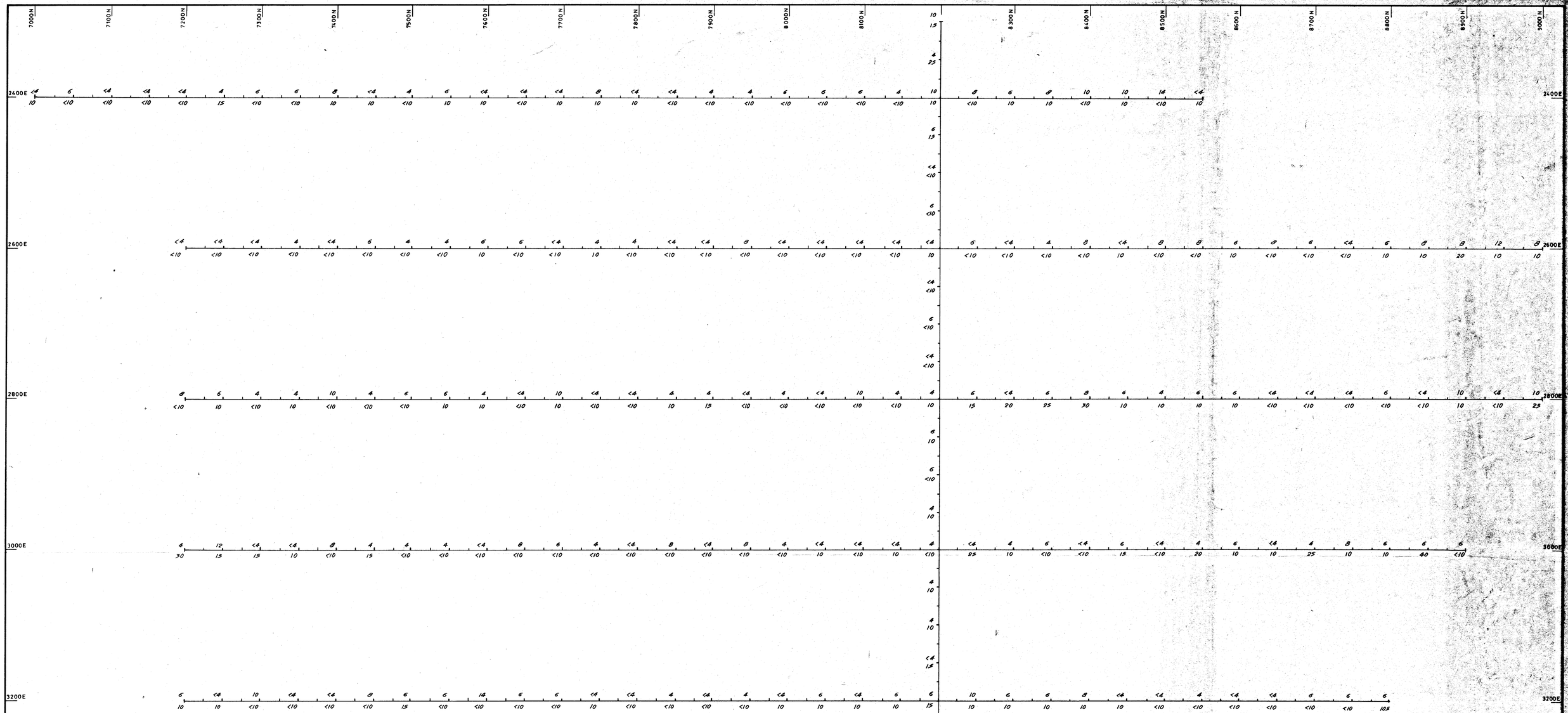
5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
Loyetea Prospect
Eastern Portion
SOIL GEOCHEMISTRY Ni, Fe.

84-2216 Scale 1:2500 961

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ 04/045
DATE 15-6-81	AUTHOR L.D. BANWELL.
DRAWN H.L.H.	OFFICE DEVONPORT.



NOTE Analyses in ppm.

Sn
W

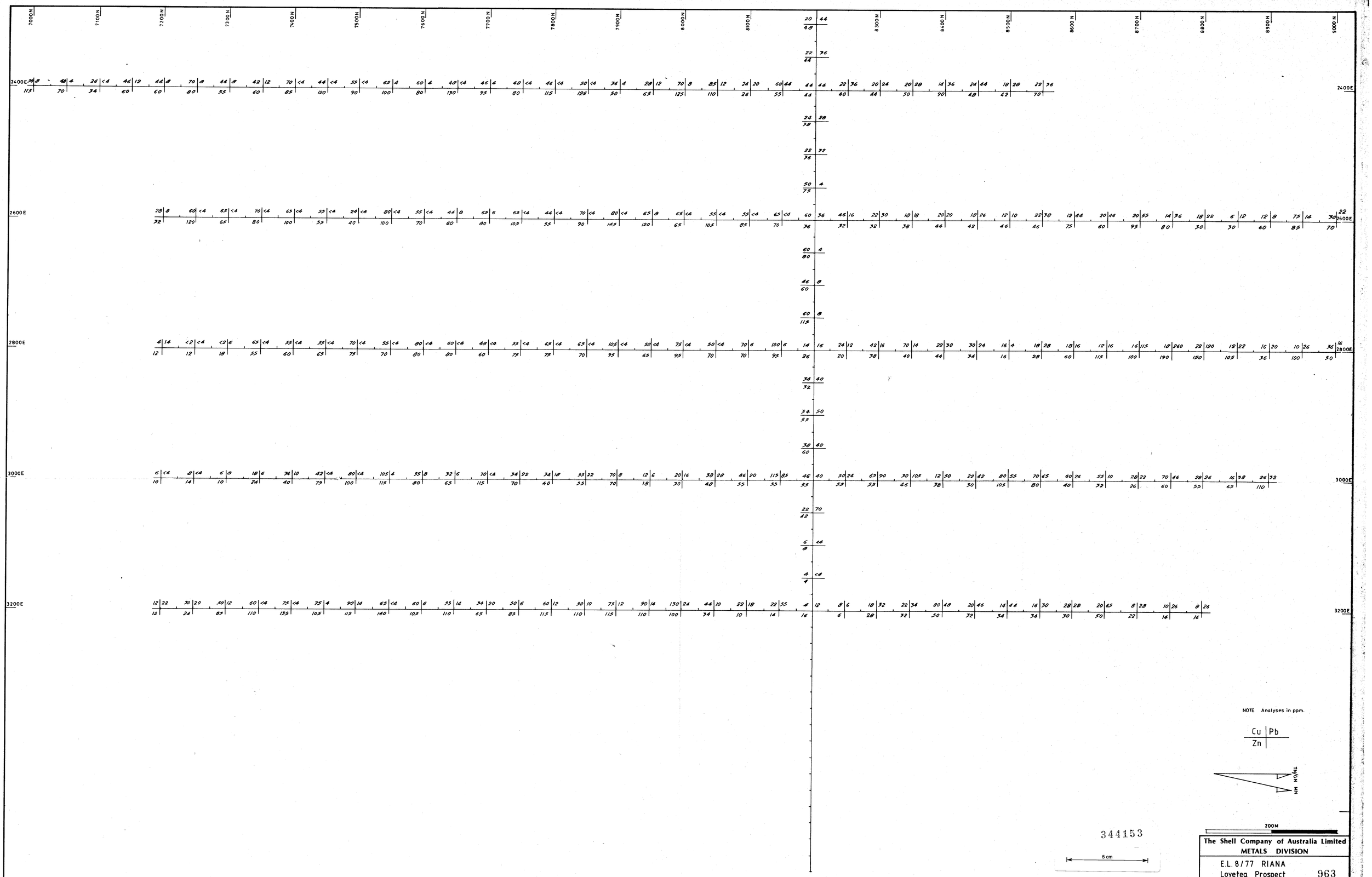
TWOMN

200M

344152

5 cm

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA Loyetea Prospect Eastern Portion SOIL GEOCHEMISTRY Sn,W	
84-2216 Scale 1:2500	962
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MG 04/046
DATE 15-6-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT


7000 N
7100 N
7200 N
7300 N
7400 N
7500 N
7600 N
7700 N
7800 N
7900 N
8000 N
8100 N
8300 N
8400 N
8500 N
8600 N
8700 N
8800 N
8900 N
9000 N
2400E
2600E
2800E
3000E
3200E
8200 N
NOTE Analyses in ppm.
Cu
Pb
Zn
TN/GN MN
200M
5 cm
344153
The Shell Company of Australia Limited
METALS DIVISION
E.L. 8/77 RIANA
Loyetea Prospect
Eastern Portion
SOIL GEOCHEMISTRY Cu, Pb, Zn.
963
BL-2216
Scale : 1: 2500
FIG. No.
REPORT No.
ENCL. No.
DRG. No. D/MQ 04/047
DATE 16-6-81
AUTHOR L.D. BANWELL
DRAWN H.L.H.
OFFICE DEVONPORT.

7000 N | 7100 N | 7200 N | 7300 N | 7400 N | 7500 N | 7600 N | 7700 N | 7800 N | 7900 N | 8000 N | 8100 N | 8200 N | 8300 N | 8400 N | 8500 N | 8600 N | 8700 N | 8800 N

1400 E
10 <4 6 18 18 6 12 10 <4 8 14 <4 4 4 8 <4 14 6 4 18 <4 16 8 28 22 14 16 10 <4 8 4 10 34
10 20 15 10 20 30 10 20 15 20 <10 15 30 <10 <10 <10 10 20 <10 25 25 60 <10 15 20 <10 <10 <10 <10 <10 20 20 <10

1600 E
6 4 <4 4 4 4 8 <4 10 10 6 8 12 6 4 8 <4 10 <4 <4 <4 8 6 8 4 <4 8 8 <4 10 10 14 10 8 6 <4 16
<10 15 10 15 25 10 15 15 30 20 20 15 <10 10 <10 15 10 <10 20 <10 20 10 <10 20 20 15 <10 <10 <10 15 <10 <10 <10 <10 <10 <10 15

1800 E
<4 14 8 <4 6 6 10 12 10 10 8 8 6 10 6 8 <4 4 <4 8 12 8 <4 <4 10 10 4 10 8 <4 4 12
20 20 <10 10 15 10 15 25 25 20 15 20 10 20 <10 10 <10 25 <10 <10 <10 15 <10 10 <10 10 <10 <10 <10 <10 15

2000 E
<4 <4 18 4 <4 <4 <4 <4 <4 10 <4 <4 <4 10 <4 6 4 6 4 8 4 18 36 6 8 6 8 <4 10 6 <4 4 6 <4 8 6 <4
<10 <10 <10 <10 <10 <10 <10 <10 15 15 10 <10 <10 <10 25 <10 15 10 10 10 10 <10 15 15 15 10 10 15 <10 <10 10 15 <10 10 <10 10 10 10

2200 E
<4 <4 10 <4 <4 4 <4 <4 <4 <4 <4 8 <4 <4 <4 <4 8 <4 6 <4 12 4 8 14 12 <4 8 10 10 8
10 <10 <10 <10 <10 <10 <10 <10 <10 <10 <10 <10 <10 <10 10 10 <10 10 10 10 15 20 <10 25 15 <10 <10 20 15 <10

2300 E

0 100 200M

NOTE: Analyses in ppm.

Sn
W

344154

5 cm

TN
MN

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
LOYETEA PROSPECT
WESTERN PORTION
SOIL GEOCHEMISTRY Sn,W.

SH-2216 Scale 1:2500 964

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/054
DATE 25-6-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT

7000 N | 7100 N | 7200 N | 7300 N | 7400 N | 7500 N | 7600 N | 7700 N | 7800 N | 7900 N | 8000 N | 8100 N | 8200 N | 8300 N | 8400 N | 8500 N | 8600 N | 8700 N | 8800 N

1400 E

1600 E

1800 E

2000 E

2200 E

2300 E

NOTE : Analyses in ppm.

Cu | Pb
Zn |

344155

5 cm

0 100 200M

TN MN

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
LOYETEA PROSPECT
WESTERN PORTION
SOIL GEOCHEMISTRY Cu,Pb,Zn.

965

84-2216 Scale : 1:2500

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/055
DATE 25-6-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT

7000 N 7100 N 7200N 7300N 7400 N 7500N 7600 N 7700 N 7800 N 7900 N 8000 N 8100 N 8200 N 8300 N 8400 N 8500 N 8600 N 8700 N 8800 N

16 1.80 12 2.3 36 1.75 36 1.70 16 1.30 18 1.70 95 1.70 8 0.93

12 26 34 6 6 8 8 18 26 40 18 34 95 32 18 30 26 22 14 22
0.78 2.0 2.5 0.35 0.70 0.75 0.52 0.66 0.76 1.35 1.15 1.65 1.30 0.94 2.4 3.1 1.40 2.3 1.10 1.65

8 36 18 14 18 36 22 12 30 30 10 18 4
0.92 1.80 1.93 1.90 2.0 1.25 2.5 2.4 2.0 1.95 1.80 1.55 1.75

1400 E

30 0.95 22 2.6 8 4.7

34 70 50 18 30 40 18 14 22 10 18 28 14 6 38 22 36 44 38 22 34 14 12 16
1.30 1.35 1.05 1.15 2.8 2.8 0.63 0.76 0.82 0.78 1.23 2.6 0.80 1.25 2.8 3.9 2.9 2.8 3.1 3.2 2.9 3.3 5.7 6.4

14 12 28 12 26 16 14 32 74 24 12 18 <4
5.6 5.3 2.4 2.0 2.0 2.3 0.37 2.4 1.75 2.4 1.95 2.00 1.75

1600 E

20 6.1 8 3.1 24 1.45

250 175 185 130 24 10 4 6 20 6 6 14 46 40 60 65 36
6.3 7.4 5.8 7.7 1.30 2.3 0.63 0.78 0.72 0.56 1.45 1.43 4.0 4.8 5.3 5.8 3.8

14 12
8.3 8.1

26 12 24 38 6 14 10 14 24 14 12 16 22
2.7 2.5 6.0 3.0 0.55 2.3 1.10 2.9 2.5 2.4 0.85 3.1 2.5

1800 E

10 2.3 18 1.70 22 5.8

105 145 85 115 145 130 135 145 40 63 80 105 34 20 36 40 38 26 40 6 40 34 20 18
6.1 4.0 6.7 7.3 8.5 9.6 9.3 9.3 5.3 4.2 6.3 7.9 2.6 1.55 3.5 3.7 3.1 3.0 2.8 1.40 2.4 4.6 11.5 4.7

20 16 10 10 10 10 12 38 40 30 14 14 16
4.0 2.3 6.2 2.4 4.3 3.6 1.45 1.85 2.1 1.15 1.25 1.63 1.60

2000 E

36 3.4 24 1.55 22 3.7

200 140 220 85 130 230 205 110 170 125 180 140 120 145 100 140 75 80 175 95 30 26
8.5 9.7 9.2 6.3 8.2 8.9 10.0 6.8 7.8 7.6 9.8 8.4 9.3 9.7 4.9 7.1 5.0 6.0 3.4 2.1 2.4 6.3

16 14 30 14
3.9 4.0 4.2 5.4

20 4.3

2200 E

0 100 200M

2300 E

344156

5 cm

NOTE: Analyses in ppm.

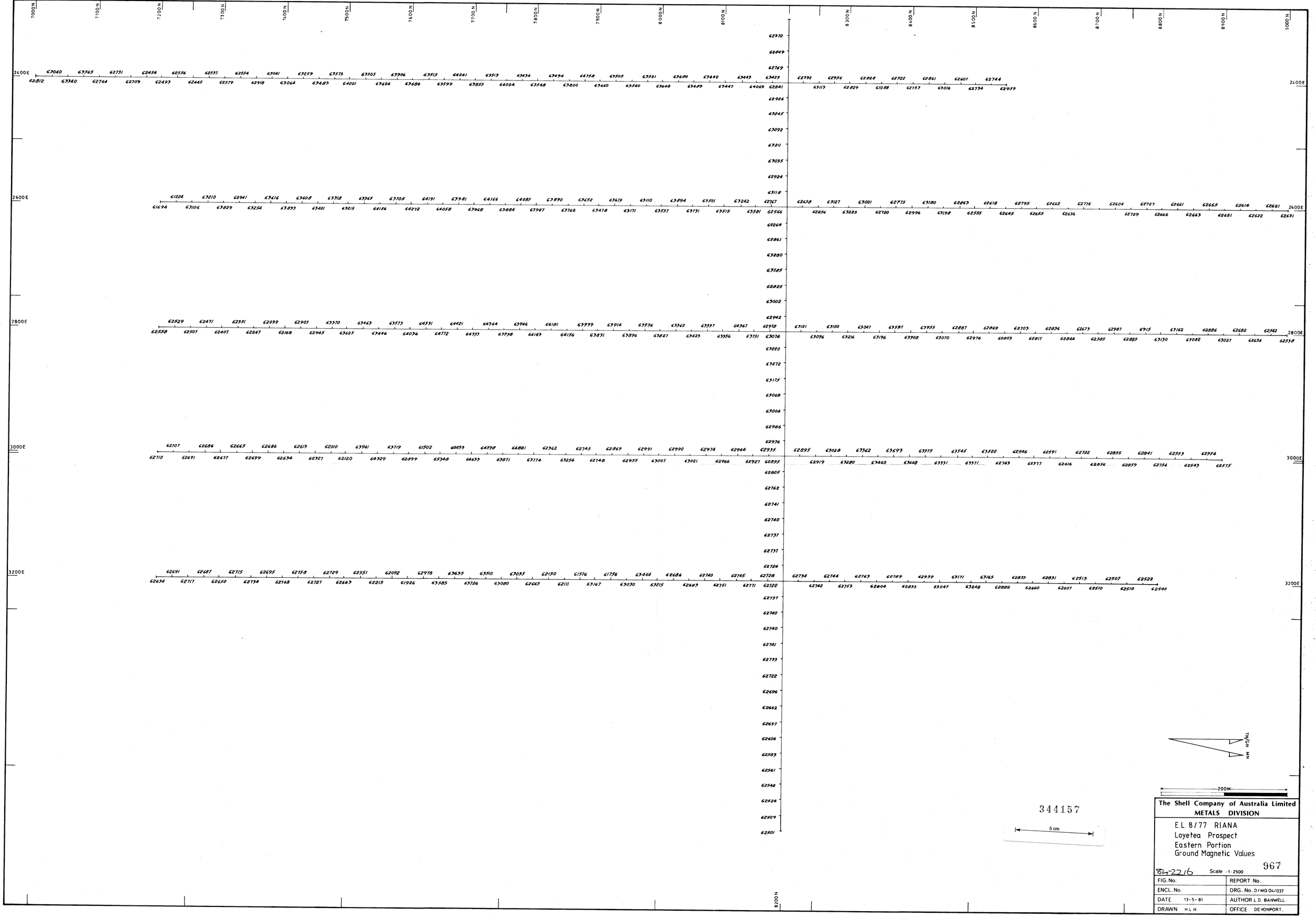
Ni / Fe%

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
LOYETEA PROSPECT
WESTERN PORTION
SOIL GEOCHEMISTRY Ni, Fe.

BH-2216 Scale 1:2500 966

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/056
DATE 26-6-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT


7000N
7100N
7200N
7300N
7400N
7500N
7600N
7700N
7800N
7900N
8000N
8100N
8300N
8400N
8500N
8600N
8700N
8800N
8900N
9000N
2400E
2600E
2800E
3000E
3200E
8200N
62812 63040 63365 62731 62454 62536 62537 62554 63041 63259 63573 63905 63906 63515 64241 63513 63434 63494 64758 63505 63521 63690 63442 63443 62841 62959
61694 61824 63210 62941 63616 63408 63318 63365 63705 64191 63981 64166 64085 63890 63652 63619 63110 63894 63501 63242 62567 62621
62550 62529 62471 62351 62099 62907 63370 63463 63573 64531 64421 64364 63946 64181 63999 63914 63936 63562 63337 64367 62918 62831
62710 62707 62686 62665 62686 62619 62010 63941 63719 61902 64493 64598 64881 62362 62745 62869 62991 62990 62974 62944 62935 62927 62895
62654 62691 62687 62715 62695 62758 62729 62551 62092 62918 63635 63510 63035 62150 61376 61756 63464 62686 62740 62745 62728 62722
62895 62895 63028 63362 63693 63775 63545 63520 62546 62591 62722 62855 62841 62553 62554
62794 62744 62763 62789 62939 63171 63165 62835 62831 62513 62507 62522
62742 62753 62804 62833 63047 63248 62882 62660 62607 62510 62510 62540
62370 62849 62769 62926 63245 63092 63211 63055 62924 63110 62658 63127 63001 62715 63180 62863 62618 62795 62662 62776 62604 62727 62661 62665 62614 62621
62834 63225 62720 62996 63198 62555 62648 62652 62636 62729 62666 62663 62681 62622 62631
62868 62861 62880 63185 62825 63002 62942 63121 63100 63047 63591 63955 62887 62869 62703 62836 62675 62987 6915 63162 62886 62682 62542 62538
63096 63216 63196 63908 63070 62976 62803 62817 62844 62505 62885 63150 63082 63027 62634
62880 62872 63175 63068 63006 62986 62976 62805 62762 62741 62740 62737 62731 62724 62737 62740 62740 62741 62733 62722 62696 62662 62697 62606 62583 62561 62548 62524 62509 62501
N/CN MN
200M
5 cm
344157
The Shell Company of Australia Limited
METALS DIVISION
E.L. 8/77 RIANA
Loyetea Prospect
Eastern Portion
Ground Magnetic Values
84-2216
Scale 1:2500
967
FIG. No.
REPORT No.
ENCL. No.
DRG. No. D/MQ 04/037
DATE 13-5-81
AUTHOR L.D. BANWELL
DRAWN H.L.H.
OFFICE DEVONPORT.

7000 N | 7200 N | 7400 N | 7600 N | 7800 N | 8000 N | 8200 N | 8400 N | 8600 N | 8800 N | 9000 N

2400 E

2600 E

2800 E

3000 E

3200 E

344158

5 cm

0 100 200M

The Shell Company of Australia Limited
METALS DIVISION

RIANA E.L. 8/77
LOYETEA PROSPECT – EASTERN PORTION 968
Stacked magnetic profiles.

1cm = 200nT VERTICAL
84-2216 Scale 1:2500 HORIZONTAL

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/039
DATE 15-5-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT

7000 N | 7100 N | 7200 N | 7300 N | 7400 N | 7500 N | 7600 N | 7700 N | 7800 N | 7900 N | 8000 N | 8100 N | 8200 N | 8300 N | 8400 N | 8500 N | 8600 N | 8700 N | 8800 N

62610
62576
62556
62571
62593
62606
62617
62627
62610
62615
62601
62590
62620
62657
62692
62747

62278 62321 62220 62260 62288 62243 62328 62297 62197 62177 62129 62084 62101 62157 62323 62355 62774 62887 62849 62860 62739 62707 62694 62709 62776 62734 62523 62513 62494 62476 62478 62469 1400 E
62356 62328 62282 62275 62292 62280 62269 62293 62253 62204 62163 62101 62085 62130 62212 62419 62682 62836 62934 62897 62807 62837 62704 62681 62696 62704 62570 62523 62500 62487 62477 62483 62466

62902
62972
63069
63258
63669
64284
65397

62164 62191 62204 62228 62207 62162 62205 62198 62221 62252 62207 62148 62103 62039 62019 61996 61948 61974 62043 62336 63043 63237 65044 65951 66315 65199 62861 62659 62535 62501 62553 62541 62536 62483 62493 62490 1600 E
62151 62172 62186 62214 62228 62117 62190 62216 62204 62287 62280 62177 62121 62070 62052 62026 61973 61947 62004 62161 62546 63644 65218 64774 65197 66101 63481 62726 62603 62505 62532 62430 62568 62526 62481 62496 62435

65742
66043
65372
64706
63857
63392
62637

61798 62048 61853 62007 61994 62050 62106 62129 62124 62104 62078 62039 62027 62015 62040 62076 62045 61982 62097 62359 62880 64259 64203 62828 62592 63533 64553 63365 62729 62563 62517 62507 62469 62546 62546 62509 1800 E
61427 61803 61899 62087 61966 62056 62070 62114 62122 62118 62092 62059 62032 62025 62013 62035 62082 61997 62036 62215 62557 63620 64471 63789 62479 62782 63531 63926 63019 62625 62509 62506 62507 62539 62548 62592 62545

62510
62419
62490
62539
62596
62649
62815

63497 65380 63604 63148 61991 62570 62475 61832 61777 61827 61856 61908 61954 62034 62095 62174 62275 62483 62619 62859 63528 64148 63522 62914 63088 63145 62877 63430 64506 63972 62693 62750 62561 62572 62528 62556 2000 E
61177 62999 63269 63831 62470 62488 63777 61885 61725 61782 61841 61901 61917 62005 62070 62132 62221 62343 62545 62764 62870 63085 64115 63120 63040 62949 64013 62802 63673 63846 63830 62719 62607 62555 62540 62512 62532

63048
62945
62885
62923
62785
62684
62943

62647 62712 62623 63094 63792 63300 63306 63161 62978 63804 63628 63401 63342 63289 63293 62478 62998 62770 63015 62902 63047 63206 63104 63317 62872 62968 64255 63615 2200 E
62166 62864 62630 62827 63748 63471 63188 63933 63058 62649 64236 63408 63118 63196 63431 62941 62485 62688 63077 62066 62958 63160 63105 63254 63097 63287 63940 63370 63275

62893
62843
62721
59764 (mst)

2300 E

0 100 200M

5 cm

344159

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
LOYETEA PROSPECT
WESTERN PORTION
GROUND MAGNETICS

84-2216 Scale 1:2500 969

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/042
DATE 1-6-81	AUTHOR L.D.BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT

LINE 1400 E

63000nT

LINE 1600 E

63000nT

LINE 1800 E

63000nT

LINE 2000 E

63000nT

LINE 2200 E

63000nT

344160

5 cm

0 100 200M

7000 N 7100 N 7200 N 7300 N 7400 N 7500 N 7600 N 7700 N 7800 N 7900 N 8000 N 8100 N 8200 N 8300 N 8400 N 8500 N 8600 N 8700 N

The Shell Company of Australia Limited
METALS DIVISION

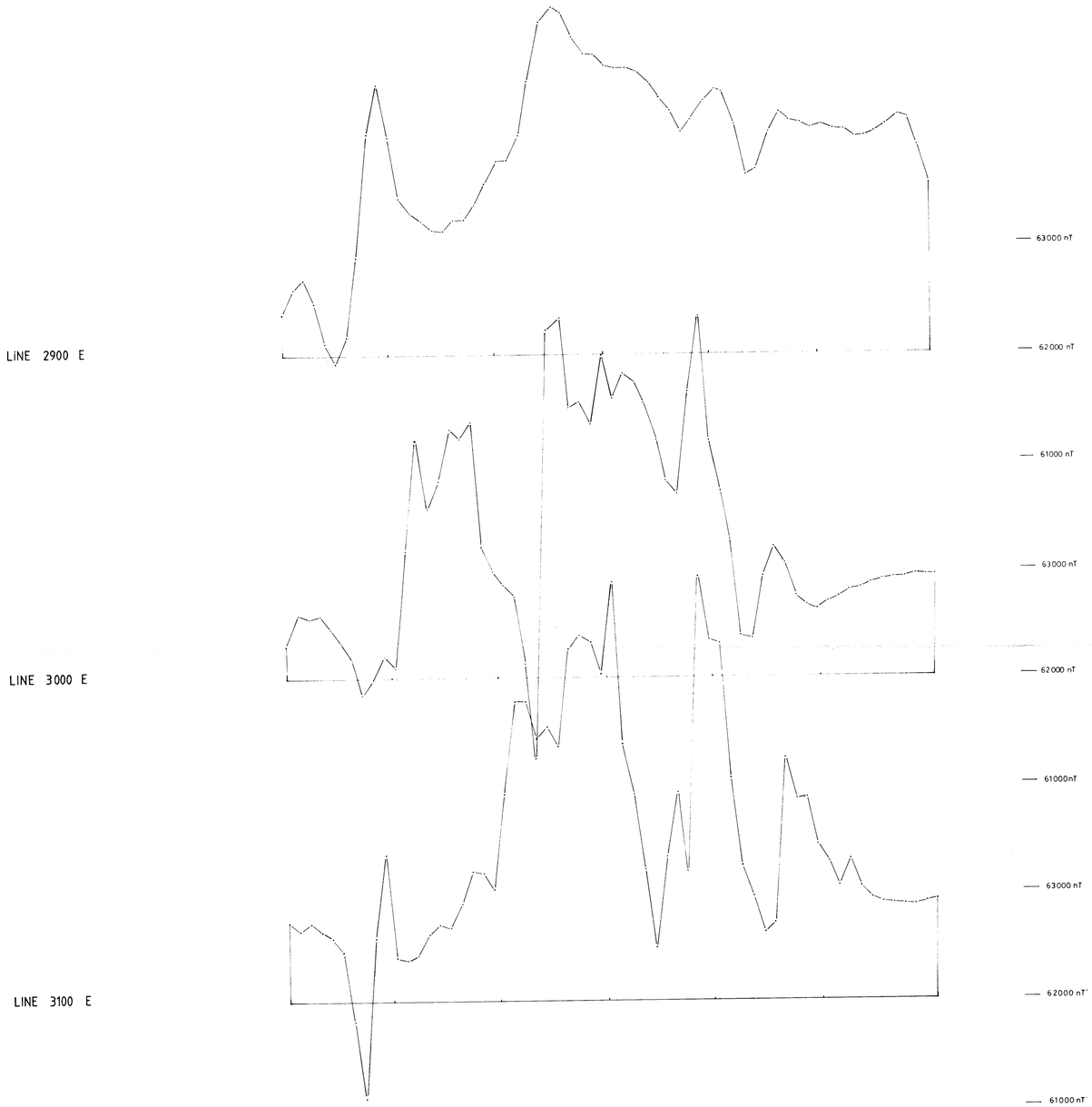
E.L. 8/77 RIANA
LOYETEA WEST
MAGNETIC PROFILES

970

1cm = 200nT VERTICAL
1:2500 HORIZONTAL

84-2216 Scale

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/048
DATE 17-6-83	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT



344161

0 100 200 M

5 cm

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA LOYETEA EAST, ANOMALY 4142/2 STACKED MAGNETIC PROFILES 2900E, 3000E, & 3100E. 971	
84-2216 Scale 1cm = 250nT VERTICAL 1: 2500 HORIZONTAL	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/070
DATE 9-9-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT.

LINE 1500 E

LINE 1600 E

LINE 1700 E

63000 nT
62000 nT
61000 nT
63000 nT
62000 nT
61000 nT
63000 nT
62000 nT
61000 nT

7300 N
7400 N
7500 N
7600 N
7700 N
7800 N
7900 N
8000 N
8100 N
8200 N
8300 N
8400 N

5 cm

344162

0 100 200M

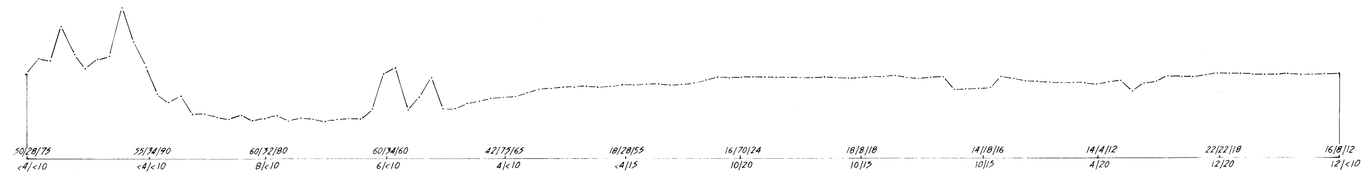
The Shell Company of Australia Limited
METALS DIVISION

E.L 8/77 RIANA
LOYETEA WEST ANOMALY 4142/11
STACKED MAGNETIC PROFILES
1500 E, 1600 E, & 1700 E 972

84-2216 Scale 1cm = 250 nT VERTICAL
1:2500 HORIZONTAL

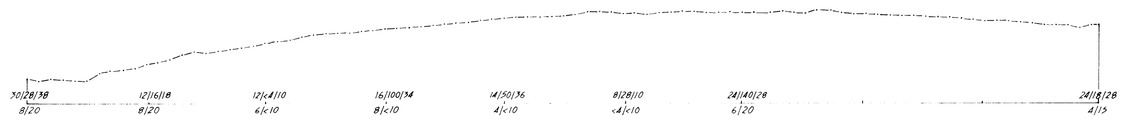
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/071
DATE 9-9-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT.

LINE 6700 N
Magnetics &
Soil Geochemistry



63000 nT
62000 nT
61000 nT

LINE 6400 N
Magnetics &
Soil Geochemistry



63000 nT
62000 nT
61000 nT

Cu/Pb/Zn
Sn/W

2100 E
2200 E
2300 E
2400 E
2500 E
2600 E
2700 E
2800 E
2900 E
3000 E
3100 E
3200 E

5 cm

0 100 200 M

344163

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
ANOMALY 4142/9
REDWATER NORTH 973
GROUND MAGNETIC PROFILES

84-2216. Scale 1cm = 250 nT VERTICAL
1:2500 HORIZONTAL

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/072
DATE 10-9-81	AUTHOR L.D. BANWELL.
DRAWN H.L.H.	OFFICE DEVONPORT.