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BILLITON AUSTRALIA

THE METALS DIVISION OF  
THE SHELL COMPANY OF AUSTRALIA LIMITED

E.L. 103/87 - BASIN LAKE  
VOLUME 1

Progress Report on Exploration for the Period Ending  
21st April, 1989

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is dated by 11/1/61

SUMMARY

Exploration carried out during the initial 12 month tenure on the Basin Lake portion of EL 103/87 has been predominantly in the southern half of the licence, which includes gridding, ground magnetics, mapping, a CSAMT gravity and Max-Min EM survey, and reinterpretation of previous exploration activity.

Two significant CSAMT anomalies are undergoing further testing with drill testing of one, a distinctive possibility.

Further gridding, geophysical surveys mapping and drill testing is recommended over the remainder of the licence.

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## 1.0 INTRODUCTION

This report details exploration completed and results achieved by Billiton Australia within the Basin Lake portion of EL 103/87 during the 12 month period to 21st April 1989. This is the first year of tenure of the licence and this report represents the initial report by the company. The licence was acquired by a successful tender to the Mines Department.

Exploration philosophy for the Basin Lake area has been to locate VMS base metal style mineralization, and/or replacement base metal and Au style mineralization at depths greater than 200m.

## 2.0 LAND TENURE

EL 103/87 was granted to The Shell Company of Australia until the 21st April 1989. The licence consists of 26 sq km, which is divided into two separate areas known as Lake Selina (10 sq km), and Basin Lake (16 sq km) (Fig. 1). This report deals with the Basin Lake area only, the Lake Selina report is in Volume 2.

The Basin Lake area comprises 6.9 sq km of Southwest Conservation Area, 7.6 sq km Crown Land and 1.5 sq km of land vested in the HEC.

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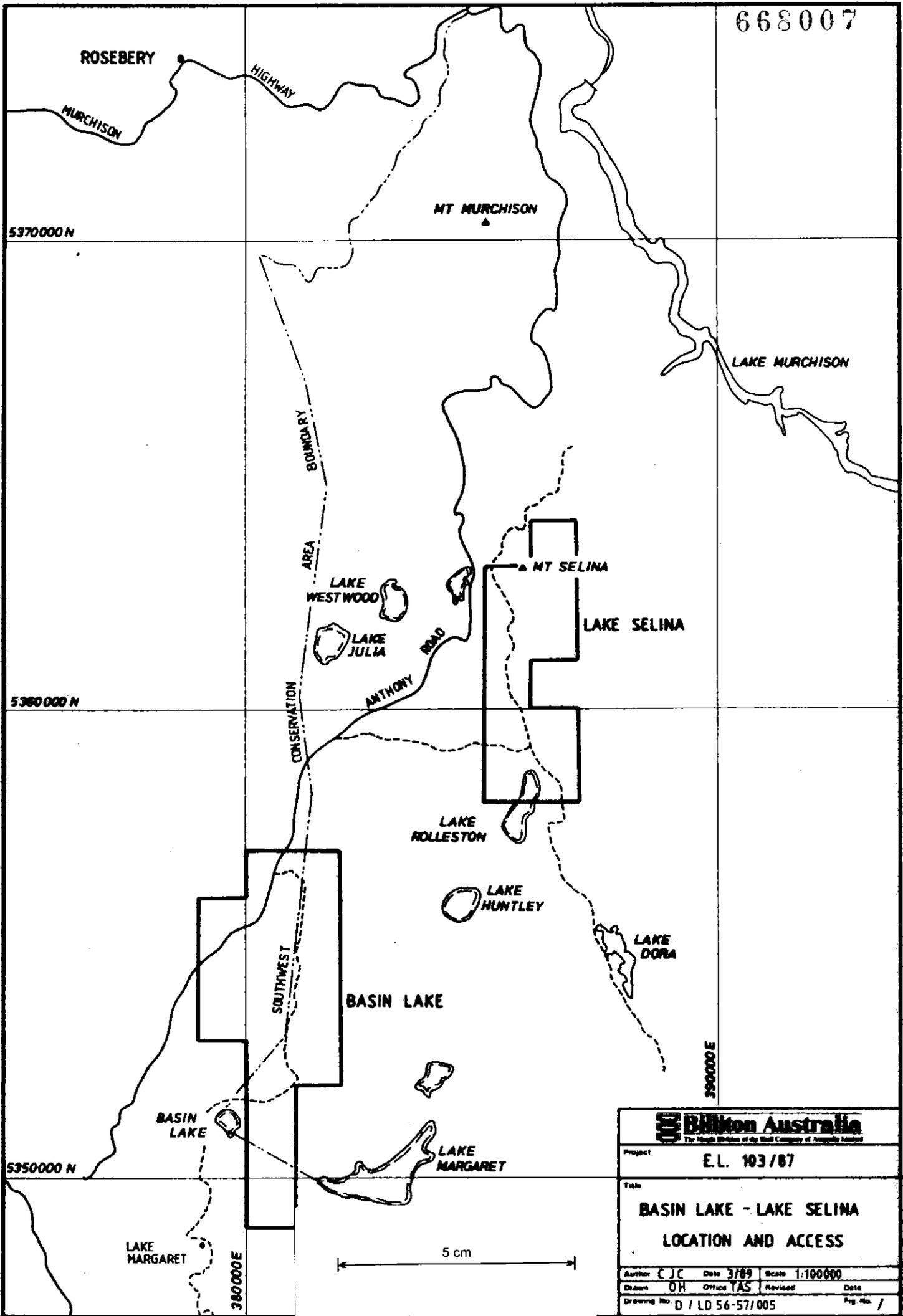
### 3.0 LOCATION & ACCESS

The Basin Lake EL is located on the west coast of Tasmania, immediately west of the Tyndall Range, approximately 10km north of Queenstown (Fig. 1). Access to the licence area is via the Anthony Road, which cross cuts the north western corner of the licence. Access within the licence is via 4WD tracks which commence from the Anthony Road. Access to the southern portion of the licence is via a walking track which commences at the Lake Margaret power station.

Large steep sided glacial moraines cross-cut (E-W) the southern portion of the licence. Vegetation varies from thick rainforest to sparse buttongrass. A HEC transmission line (ungrounded) passes through two thirds of the licence.

### 4.0 GEOLOGICAL SETTING

The Basin Lake licence area is located within the Cambrian Mt. Read Volcanics, a northerly trending predominantly felsic volcanic arc on the west coast of Tasmania (Fig. 2). More specifically the EL contains a comprehensive cross-section of the Mt. Read Volcanics, bound on the west by the South Henty Fault. Moving up through the sequence and across strike from west to east the licence area contains units of the Western Volcano-sedimentary Sequence, a sequence of Middle Cambrian felsic to basic volcanics and intrusives, quartz rich sandstones



<b>Bilton Australia</b> <small>The High Quality of the Best Company of Australia</small>			
Project	E.L. 193/87		
Title	BASIN LAKE - LAKE SELINA LOCATION AND ACCESS		
Author	CJC	Date	3/89
Scale	1:100000		
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Revised		Date	
Drawing No.	D / LD 56-57/005		Pg. No. /

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greywackes and shales. Situated stratigraphically above and interfingering with the Western Sequence are members of the Middle to Late Cambrian Central Volcanic Complex. This complex forms the central part of the licence, consisting of a north-south striking sequence of predominantly feldspar phyric intermediate volcanics and lesser intrusives with interspersed felsic volcanics and epiclastics, shales and sandstones. This sequence is commonly pyritic, and within the licence area is known as the Basin Lake Sulphide Zone. East of the Central Volcanic Complex and conformably overlying are members of the Tyndall Group, predominantly quartz - feldspar phyric volcanics and their sedimentary derivatives. The eastern boundary of the licence is dominated by the Great Lyell Fault, to the east of which is a massive down thrown fault block of Ordovician Owen Conglomerate.

The Basin Lake licence is located 10 km north of the giant Mt. Lyell ore body and 10 km south of the recently discovered Henty Prospect.

#### 5.0 PREVIOUS EXPLORATION

Detailed exploration of the Basin Lake area was first carried out by Pickands Mather between 1965 and 1971. A dipole-dipole IP survey located a strong anomaly northeast of Basin Lake over an area covered by glacial moraine. Two vertical holes (BL 801 and 802) were drilled to test this anomaly (Fig. 3). BL 802 was abandoned before reaching the

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target. As a result of this inconclusive drilling Pickands Mather ran a Turam EM survey over this zone, delineating an anomaly just west of the IP anomaly. The response was attributed to pyritic black shales intersected in BL 801.

The northern portion of the Basin Lake licence was covered by dipole-dipole IP surveys in 1967-68 by Mt. Lyell. TYN 1 was drilled in 1968-69 intersecting mostly graphitic shales with no significant mineralization.

Gradient array IP in 1973-74 reaffirmed five anomalous zones in the north western portion of the licence. A magnetic survey was also completed in 1974-75. Primary anomalies were followed up by soil geochemistry and infill IP surveys. Drill holes TYN 2 and TYN 3 were completed in 1974-75 intersecting mostly unmineralized pyritic black shales.

Two diamond drill holes BL 1 and BL 2 were completed in 1978 in the vicinity of the earlier Pickands Mather holes. These holes intersected minor base metal mineralization in a felsic tuffaceous sequence.

Further dipole-dipole IP, magnetic and soil geochemical surveys were carried out south of Howard's Anomaly (immediately north of the licence). Holes BL 3 and BL 4 were drilled in 1981. BL 4 intersected a zone of 15m of semi-massive pyrite within strongly sericitized volcanoclastics.

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A Genie EM survey was conducted in 1982, however no anomalous areas were defined.

Hole BL 5 was drilled in 1985 to test southerly strike extensions to the mineralization in BL 4. The highly pyritic zone was intersected but no massive sulphide mineralization was present. In late 1985 GoldFields conducted a UTEM survey over 4.5km of the central sulphide zone resulting in 10 anomalous areas. The western pyritic alteration zone around Leech Hill was surveyed by SIROTEM in 1986.

Following the EM surveys, GoldFields conducted a thorough review of all the geophysical data at Basin Lake and concluded that three responses (UTEM, and/or IP), were worthy of further testing. All three anomalies were in the northeast part of the property, towards the top of the volcanoclastic/sediment sequence. The best two of the geophysical responses were drilled in 1986 (TYN 4 and 5). Both holes failed to intersect any sulphides.

#### 6.0 EXPLORATION COMPLETED

Exploration during the reporting period has focused on the southern portion of the licence. This area of the licence has been rejected by previous explorers due to the extensive glacial sedimentary cover in this region.

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The original exploration philosophy of searching for massive sulphide targets at depths greater than 200m has been adhered to during the current programme.

Approximately 12.2 line km of grid were constructed over the southern portion of the licence. The grid lines were surveyed by CSAMT and ground magnetics, and interpretations of the data carried out. Anomalous regions from these surveys have been investigated by Max-Min EM, gravity, infill magnetics, repeat CSAMT and an unsuccessful TEM survey.

A 3mgal gravity anomaly reported by the Tasmanian Mines Department has been investigated.

GoldFields diamond drill hole BL 4 was selectively sampled and reassayed for base and precious metals.

## 7.0 EXPLORATION RESULTS

### 7.1 Geology

A new grid with 400m line spacing, totalling 12.2 line kms and 8 km of access lines were constructed in the southern portion of the licence. The grid was completed under contract in April 1988. Mapping of this grid revealed little information, with outcrop almost nonexistent through-out the area west of the Great Lyell Fault (Fig. 3). The

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region is almost entirely covered in glacial moraine-sedimentary deposits. The geology within this region is largely inferred from drilling and geophysical surveys carried out to the north by GoldFields Exploration. North of 352000N the geology is interpreted to consist of four distinct zones:

- 1) An eastern felsic to intermediate volcanic, epiclastic and sedimentary sequence of the Central Volcanic Complex, often quite altered and pyritic (Sulphide Zone). The sequence is interpreted to dip steeply from the west to east, possibly facing east. The fault contact along the eastern boundary (Great Lyell Fault), consists of quartz-feldspar phyrlic volcanics of the ?Tyndall Group to the west, and Ordovician Owen Conglomerate to the east. A brief structural and lithological examination of DDH BL 1 was carried out to determine the orientation of the stratigraphy (Fig. 4).
- 2) A central hornblende phyrlic rhyodacitic intrusive porphyry, intruded within feldspar phyrlic andesitic volcanics and ?intrusives of the Central Volcanic Complex.
- 3) Two zones of felsic, altered and pyritic volcanic and sedimentary rocks on the western margin of the central intrusive porphyry.

- 4) A western zone of predominantly argillaceous sediments and lavas of the Western Volcano-sedimentary sequence.

## 7.2 Geophysics

Exploration within the licence has predominantly been centred on the use of various geophysical techniques in the search for massive sulphide targets. This approach has been necessary because of the thick glacial and sedimentary bedrock cover. At Basin Lake the following geophysical surveys have been carried out during the report year:

Ground Magnetics: (Billiton)	Lines 349000mN - 353000mN 12.2 line kms, 10m station spacing 400m line spacing
CSAMT: (Zonge)	Lines 349000mN - 353000mN 12.6 line kms (12.2 @ 80m stns, 0.4 @ 40m stns) 400m line spacing, 80m & 40m E-dipoles 9 frequencies
Max-Min EM: (Billiton)	Lines 352600mN, 353000mN 2.1 line kms, 20m station spacing 150m Tx-Rx coplanar loops 4 frequencies
Gravity: (Billiton)	Lines 3526000mN, 353000mN, 350200mN 2.3 line kms, 40m & 20m station spacing

An attempt was made to survey lines 352800N and 352700N using Zonge's GDP-12 in the TEM mode. Unfortunately power line noise and equipment problems made the data useless and thus the profiles are not included in this report.

## 7.2 Ground Magnetics

The stacked profiles (Figs. 5 & 6), indicate a major change in rock type (E-W /fault), between 352200N and 351800N from more magnetic to less magnetic units. This feature is also easily identified from the aeromag data (Fig. 7). Lack of outcrop precludes positive identification of these rock types although the magnetic units may be andesites.

Dips in the northern part of the grid appear to be generally to the east.

### 7.2.2 CSAMT

The sections are presented in Figs. 8 - 19, as Cagniard Resistivity and Phase Difference as a function of frequency (lower frequency implies greater depth penetration in the 'far-field'). Generally only the highest 3 or 4 frequencies are of real significance in this very resistive environment. A depth penetration of 500 to 1000 metres can be expected (detection however is also determined by body size and conductivity).

As with the magnetics, a major change occurs at about 351800N. South of this line there are no conductors indicating homogeneous bedrock with no major contacts

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or faults. To the north, three main conductive trends are apparent. The eastern-most one is probably related to the Great Lyell Fault, and the central one may be related to a mineralised volcanoclastics unit drilled to the north by RGC. The source of the western conductor is unclear at present, but it is somewhat downgraded by the lack of a high Phase Difference anomaly. The proximity of a major HEC power-line (ungrounded) may have had some effect on the latter conductor, although the conductor does have a N-S strike and cross-cuts the powerline (which is SW-NE).

#### 7.2.3 Max-Min EM

This was used to detail the western and central CSAMT conductors on lines 353000N and 352600N respectively. There is a clear conductor on line 352600N at 380875E (Fig. 20) coincident with the CSAMT conductor and an existing UTEM conductor from previous RGC work. The source is moderately conductive and appears to subcrop beneath about 40 metres of glacials.

On line 353000N (Fig. 21) there is only a weak surficial-type response coincident with the position of the western CSAMT conductor. This implies that the CSAMT source may be relatively deep (greater than 75m). It is of interest to note that on this line there are

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no Max-Min or UTEM conductors coincident with the central CSAMT conductor at 380900E, possibly for the same reason.

The Max-Min In-Phase readings on both lines are noisy due to terrain effects, despite care taken in the field to ensure correct coil spacing and loop inclination.

#### 7.2.4 Gravity

Two short sections of lines 353280N and 352600N were surveyed in order to determine whether any gravity anomalies are coincident with the CSAMT conductors. On line 352600N a residual gravity anomaly does occur (Fig. 22) but it is about 300m east of the EM conductor. Variations in the glacial thickness probably account for this anomaly. No terrain corrections were applied to the data so 'noise' can be expected on the profile.

Line 352800N (Fig. 23) is rather noisy due either to levelling problems in the thick scrub, or more likely, inaccurate gravity readings. There does appear to be 0.6 mgal residual anomaly at 380250N. No Max-Min or CSAMT has been done on this line to date so any EM correlation with the gravity anomaly is unknown. On adjacent lines the conductors are about 200m east.

Line 350200N was surveyed to cover a Mines Department 3 mgal anomaly near Basin Lake (Fig. 24). An anomaly of this magnitude was not detected so presumably the original data point was incorrect. A 0.5 mgal anomaly (Fig. 25), between 380400 and 380500mE has a weak shallow near-coincident CSAMT conductor (Fig. 16), that probably has a surficial source.

All the gravity profiles indicate the gravity field decreasing to the east. This agrees with the Mines Department gravity maps. Leaman (Gravity Interpretation, West and Northwest Tasmania 1986) has modelled a regional profile across this area, which indicates depth to less-dense Pre-Cambrian basement of about 4 kms and a westerly dip on the Great Lyell Fault.

### 7.3 Geochemistry

Past experience with Billiton Australia has shown that gold detection is best achieved by using the fire assay method of analysis. For this reason DDH BL 4 was sampled and reassayed for Au Ag Cu Pb Zn As and Ba over a 60m section including 15m of semi-massive to massive pyrite. The results are shown in Appendix 1. The zone of 2m of massive bedded pyrite from 68-70m (#15885-#15886) indicates distinct precious and base metal anomalism however the Au values are very low (0.06ppm). A study of the base metal ratios (Pb/Zn and Cu/Pb) with other known VMS deposits in northwest Tasmania

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has revealed no obvious similarities, which exist between the known deposits.

Extensive rock chip and soil geochemical sampling programmes were conducted over the licence by GoldFields Exploration. Results from these surveys have been compiled on Fig. 26. A weak base metal anomalism occurs concurrent with an earlier reported CSAMT and Max-Min EM anomaly on line 352600N.

#### 8.0 CONCLUSIONS

No significant features emerged from the exploration carried out south of 352000N. The 3 mgal gravity anomaly recorded by the Tasmanian Mines Department has shown to be an incorrect reading. However, a 0.5 mgal anomaly does occur on line 350200N coincident with a weak shallow CSAMT conductor of probable surficial source.

A coincident CSAMT, Max-Min EM, UTEM, IP and weak base metal geochemical anomaly occurs on line 352600N, 380850E (Fig. 27). The anomaly is believed to be a moderate conductor at 50m depth, possibly a bedrock horizon subcropping beneath the glacial sedimentary cover.

A north-south striking CSAMT anomaly occurs on lines 352600N and 353000N at 380300E, however, definition of this anomaly is difficult with a weak response resulting from a

follow-up Max-Min EM survey. The source of the CSAMT anomaly is probably at a depth greater than 75m. Minor outcrop has been observed in this region, suggesting the anomaly is not a channelling feature due to glacial activity.

#### 9.0 RECOMMENDATIONS

Further work is recommended on the CSAMT anomalies recorded in the northern part of the present Billiton grid. Further definition of these anomalies is necessary to provide accurate targets for drill testing.

Further work will involve construction of a 400m spaced grid over the remainder of the licence and a subsequent CSAMT geophysical survey over the grid. Mapping will be carried out on this grid. A more accurate understanding of the orientation of the stratigraphy will be attempted from close examination of drill core from BL 4 and BL 5. Preliminary studies have located a distinctive pyroxene basalt lava in BL 4, which as yet has not been located in BL 5, along strike 150m south of BL 4.

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PURVIS, J.G., JONES, M.T., FITZGERALD, F.G., POLTOCK, R.A.,  
1983. A geological review of the Tyndall Exploration  
Licence 9/66, Western Tasmania. GoldFields Exploration  
Pty. Ltd.

APPENDIX 1

Job: 8AD4001  
O/N: 08465/LD57/CJC

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## ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
15592	0.04	--	--	--	<2	46	<1
15593	0.02	--	--	--	66	84	<1
15594	0.01	--	--	--	38	100	<1
15595	0.01	--	--	--	52	74	<1
15596	0.02	--	--	--	90	98	<1
15597	0.03	0.04	0.02	--	78	175	<1
15598	0.01	--	--	--	140	115	<1
15599	0.03	--	--	--	390	60	1
15600	0.04	0.04	0.03	--	2250	210	30
15883	0.03	--	--	--	50	9	1
15884	0.02	--	--	--	60	14	1
15885	0.05	--	--	--	270	155	40
15886	0.06	0.06	0.06	--	680	310	74
15887	0.02	--	--	--	130	66	7
15888	0.02	--	--	--	70	15	3
15889	0.02	--	--	--	76	13	1
15890	0.02	--	--	--	185	145	8
15891	0.02	--	--	--	155	40	7
15892	0.01	--	--	--	220	185	3
15893	0.01	--	--	--	60	320	<1
15894	0.01	--	--	--	150	220	1
15895	<0.01	--	--	--	48	130	<1
15896	0.01	--	--	--	16	155	<1
15897	0.01	--	--	--	36	120	<1
15898	0.06	--	--	--	42	210	<1
UNITS SCHEME	ppm FA1	ppm FA1	ppm FA1	ppm FA1	ppm AAS1	ppm AAS1	ppm AAS2



Job: 8AD4001

O/N: 08465/LD57/CJC

## ANALYTICAL REPORT

SAMPLE	Ba	Pb	As
15592	1200	70	26
15593	1040	28	22
15594	960	17	16
15595	1220	24	34
15596	1120	76	38
15597	970	62	24
15598	1440	54	20
15599	2500	105	190
15600	870	1560	1260
15883	1840	105	44
15884	2950	145	88
15885	8000	1880	440
15886	2.65%	2750	870
15887	1.20%	580	220
15888	2650	730	195
15889	1760	570	185
15890	8200	930	220
15891	5800	470	88
15892	4650	590	72
15893	970	150	22
15894	830	135	52
15895	1360	240	16
15896	1280	34	9
15897	690	185	17
15898	470	185	17
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1
UPPER SCHEME	XRF2		

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Job: 8AD4001

O/N: 08465/LD57/CJC

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## ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
15592	0.04	--	--	--	<2	46	<1
15593	0.02	--	--	--	66	84	<1
15594	0.01	--	--	--	38	100	<1
15595	0.01	--	--	--	52	74	<1
15596	0.02	--	--	--	90	98	<1
15597	0.03	0.04	0.02	--	78	175	<1
15598	0.01	--	--	--	140	115	<1
15599	0.03	--	--	--	390	60	1
15600	0.04	0.04	0.03	--	2250	210	30
15883	0.03	--	--	--	50	9	1
15884	0.02	--	--	--	60	14	1
15885	0.05	--	--	--	270	155	40
15886	0.06	0.06	0.06	--	680	310	74
15887	0.02	--	--	--	130	66	7
15888	0.02	--	--	--	70	15	3
15889	0.02	--	--	--	76	13	1
15890	0.02	--	--	--	185	145	8
15891	0.02	--	--	--	155	40	7
15892	0.01	--	--	--	220	185	3
15893	0.01	--	--	--	60	320	<1
15894	0.01	--	--	--	150	220	1
15895	<0.01	--	--	--	48	130	<1
15896	0.01	--	--	--	16	155	<1
15897	0.01	--	--	--	36	120	<1
15898	0.06	--	--	--	42	210	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2



Job: 8AD4001

O/N: 08465/LD57/CJC

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ANALYTICAL REPORT

SAMPLE	Ba	Pb	As
15592	1200	70	26
15593	1040	28	22
15594	960	17	16
15595	1220	24	34
15596	1120	76	38
15597	970	62	24
15598	1440	54	20
15599	2500	105	190
15600	870	1560	1260
15883	1840	105	44
15884	2950	145	88
15885	8000	1880	440
15886	2.65%	2750	870
15887	1.20%	580	220
15888	2650	730	195
15889	1760	570	185
15890	8200	930	220
15891	5800	470	88
15892	4650	590	72
15893	970	150	22
15894	830	135	52
15895	1360	240	16
15896	1280	34	9
15897	690	185	17
15898	470	185	17
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1
UPPER SCHEME	XRF2		



Job: 8AD4001

O/N: 08465/LD57/CJC

## ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
15592	0.04	--	--	--	<2	46	<1
15593	0.02	--	--	--	66	84	<1
15594	0.01	--	--	--	38	100	<1
15595	0.01	--	--	--	52	74	<1
15596	0.02	--	--	--	90	98	<1
15597	0.03	0.04	0.02	--	78	175	<1
15598	0.01	--	--	--	140	115	<1
15599	0.03	--	--	--	390	60	1
15600	0.04	0.04	0.03	--	2250	210	30
15883	0.03	--	--	--	50	9	1
15884	0.02	--	--	--	60	14	1
15885	0.05	--	--	--	270	155	40
15886	0.06	0.06	0.06	--	680	310	74
15887	0.02	--	--	--	130	66	7
15888	0.02	--	--	--	70	15	3
15889	0.02	--	--	--	76	13	1
15890	0.02	--	--	--	185	145	8
15891	0.02	--	--	--	155	40	7
15892	0.01	--	--	--	220	185	3
15893	0.01	--	--	--	60	320	<1
15894	0.01	--	--	--	150	220	1
15895	<0.01	--	--	--	48	130	<1
15896	0.01	--	--	--	16	155	<1
15897	0.01	--	--	--	36	120	<1
15898	0.06	--	--	--	42	210	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2



Job: 8AD4001

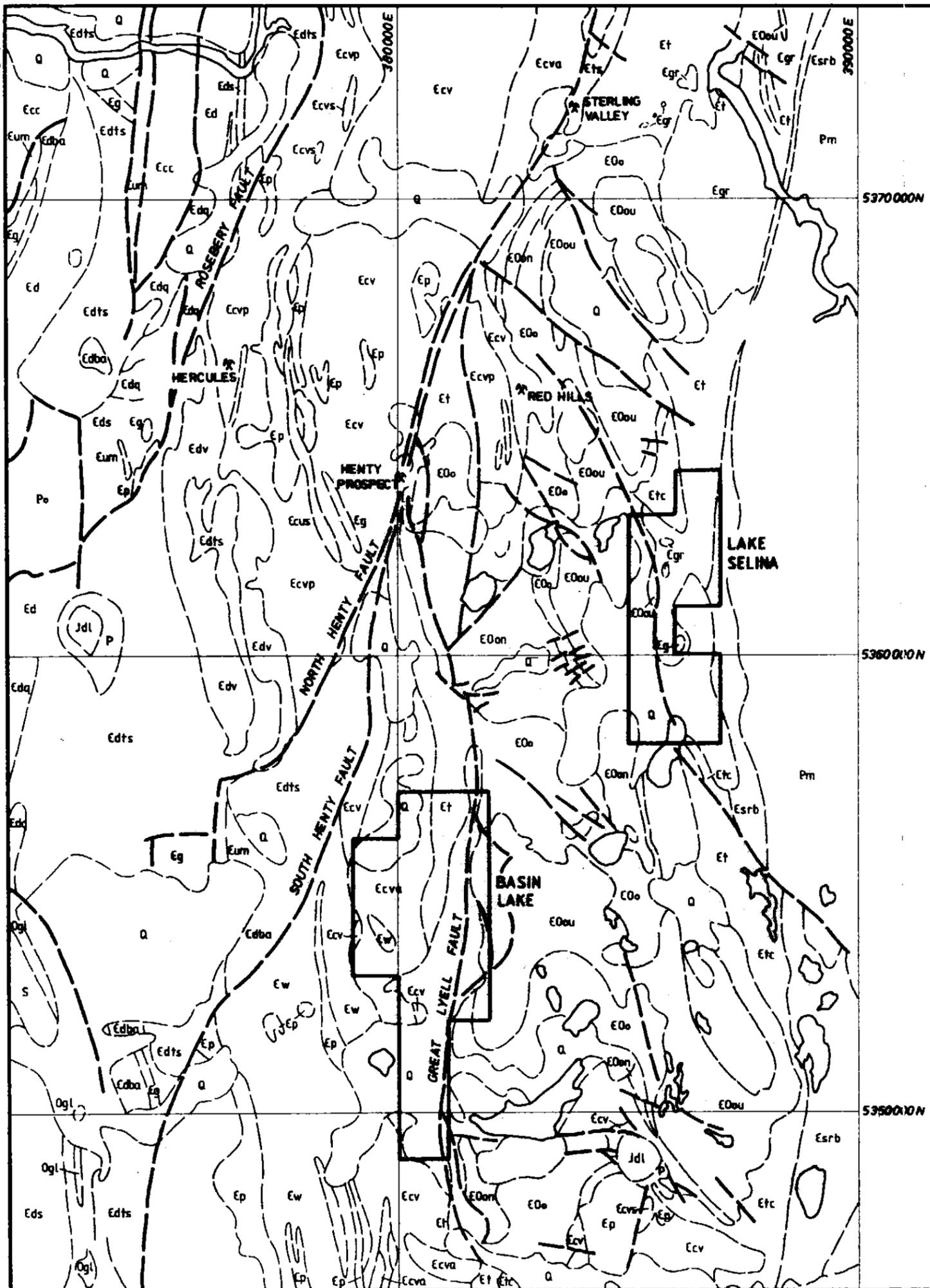
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668028

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ANALYTICAL REPORT

SAMPLE	Ba	Pb	As
15592	1200	70	26
15593	1040	28	22
15594	960	17	16
15595	1220	24	34
15596	1120	76	38
15597	970	62	24
15598	1440	54	20
15599	2500	105	190
15600	870	1560	1260
15883	1840	105	44
15884	2950	145	88
15885	8000	1880	440
15886	2.65%	2750	870
15887	1.20%	580	220
15888	2650	730	195
15889	1760	570	185
15890	8200	930	220
15891	5800	470	88
15892	4650	590	72
15893	970	150	22
15894	830	135	52
15895	1360	240	16
15896	1280	34	9
15897	690	185	17
15898	470	185	17
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1
UPPER SCHEME	XRF2		

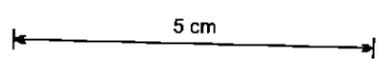


**LEGEND**

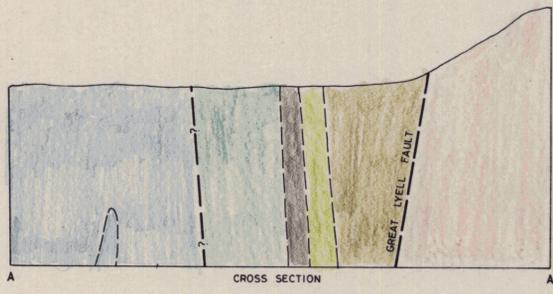
- Q Quaternary
- Jdl Jurassic
- P Permian
- S Silurian
- Ogl Ordovician
- EDou Cambrian Denison Group
- EOn
- Eo
- Et Cambrian Tyndall Group
- Ets
- Etc
- Esrb
- Cd Cambrian Dundas Group
- Eds
- Edts
- Edq
- Cdv
- Cdba
- Ecv Cambrian Central Volcanic Complex
- Ecvp
- Ecvs
- Ecva
- Cw Cambrian Western Sequence
- Ecc Cambrian Crispin Creek Formation
- Po Pre Cambrian
- Pm
- Egr Cambrian Intrusives
- Cp
- Cg
- Cum

668029

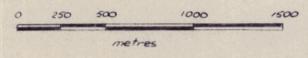
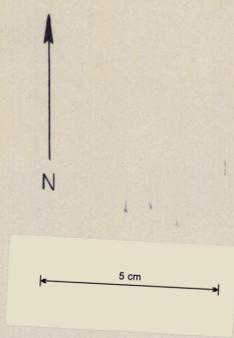
**89-2928**



<b>Billiton Australia</b> <small>The Australasian Division of the Shell Company of Australia Limited</small>			
Project		E.L. 103/87	
Title <b>BASIN LAKE - LAKE SELINA GEOLOGICAL SETTING</b>			
Compiled from Corbett & McNeill 1988			
Author	CJC	Date	3/89
Scale	1:100 000		
Drawn	OH	Office	TAS
Revised	Date		
Drawing No.	D/LD 56-57/006		Fig. No. 2



- QUATERNARY
  - GLACIAL DEPOSITS
  - ALLUVIAL MARSH DEPOSITS
  - OWEN CONGLOMERATE
- TYNDALL GROUP
  - SHALE, SILTSTONE, SANDSTONE
  - ANDESITE TUFF AND BRECCIA WITH SHALE LENSES
  - UNDIFFERENTIATED TYNDALL GROUP, INCLUDING QUARTZ PHYRIC FELSIC LAVAS
- CENTRAL VOLCANIC SEQUENCE
  - QUARTZ FELDSPAR ± PYROXENE WITH MUSCOVITE PORPHYRY
  - SHALE, SILTSTONE, SANDSTONE, MINOR TUFF
  - FELSIC, FELDSPAR PHYRIC PYROCLASTICS
  - FELDSPAR PHYRIC RHYOLITIC TO DACITIC LAVAS
  - ANDESITIC LAVAS, BRECCIAS, TUFFS AND INTRUSIVES
  - UNDIFFERENTIATED CENTRAL VOLCANIC SEQUENCE
- WESTERN VOLCANO-SEDIMENTARY SEQUENCE
  - FELSIC PYROCLASTIC ROCKS
  - INTERBEDDED SILTSTONE, SHALE, LITHIC SANDSTONE AND MINOR TUFF
  - UNDIFFERENTIATED WESTERN VOLCANO-SEDIMENTARY SEQUENCE
- UTEM COMPLETED 18N TO 78S INCLUSIVE
- BAUS GRID LINE
- DIAMOND DRILL HOLE
- BASIN LAKE SULPHIDE ZONES



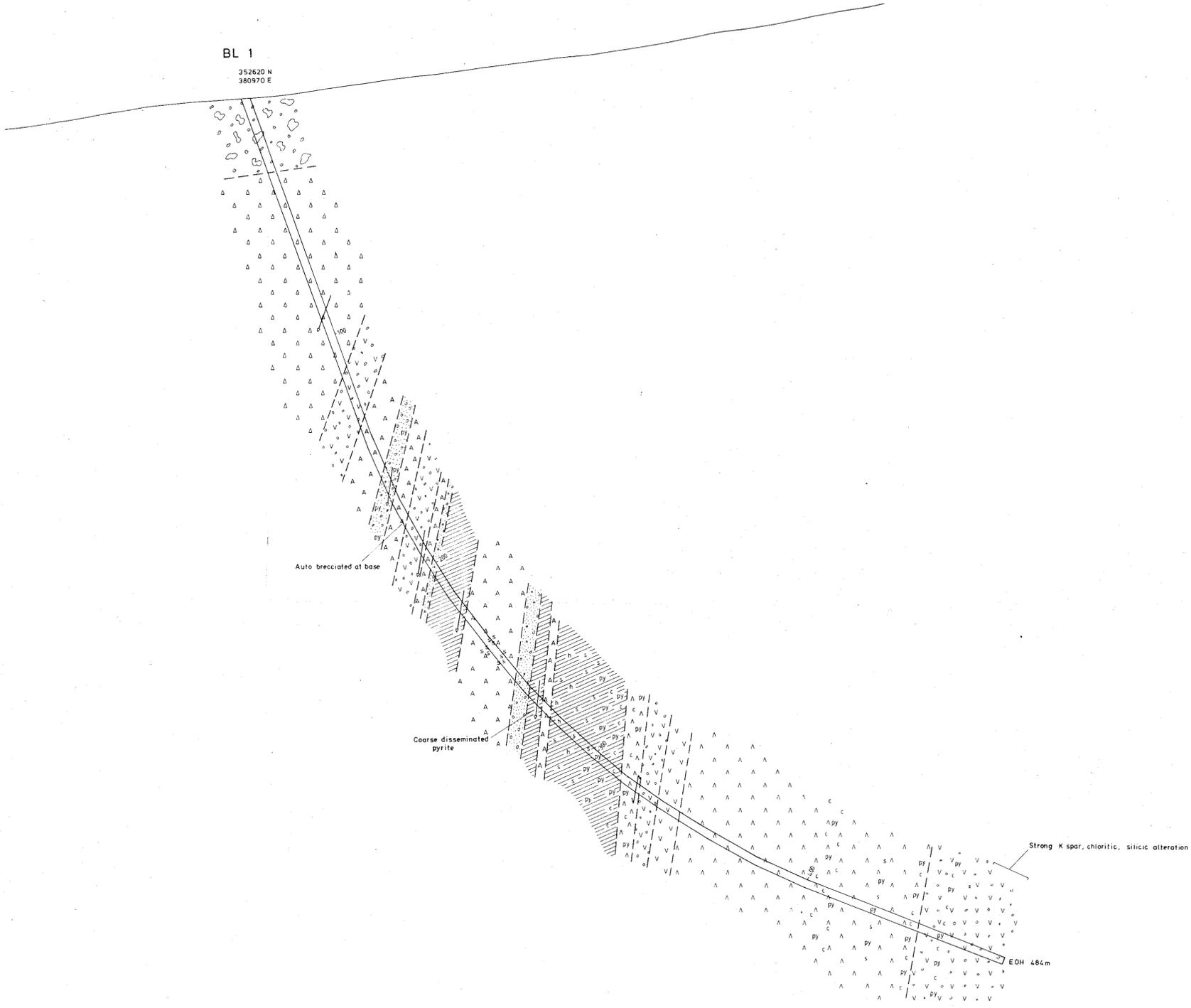
668030

89-2928

Grid Scale not consistent

<b>Billiton Australia</b> The Metals Division of the Shell Company of Australia Limited			
Project		BASIN LAKE	
Title			
GEOLOGY & GRID PLAN			
Author	CJC	Dept. TAS	Scale 1:20,000
Drawn	OH	Date 11/88	Revised Date
Checked		Date	S'ceded Date
Sheet No.	Fig 3		Drawing No. D/LD 57/001

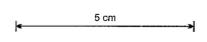
BL 1  
352620 N  
380970 E



**LEGEND**

-  Glacial Moraine
  -  Andesitic feldspar pyritic epiclastics lavas
  -  Dacitic feldspar ± quartz pyritic epiclastics
  -  Feldspar, hornblende pyritic ?andesitic ?lava
  -  Epiclastic - coarse clasts of dacitic - rhyodacitic volcanics in fine grained matrix. Minor siltstone clasts.
  -  Interbedded fine grained sandstones, siltstones and black shales with coarse epiclastics towards base of unit.
  -  Quartz feldspar pyritic rhyodacitic ?lavas
  -  Feldspar ± quartz pyritic dacitic ?lavas
  -  Bedding
  -  Cleavage
- ALTERATION**
- s strong silification
  - h strong hematitic alteration
  - c sericitic alteration
  - py disseminated pyrite

668031



89-2928

<b>Billiton Australia</b> <small>The Metals Division of the Shell Company of Australia Limited</small>			
Project		BASIN LAKE	
Title		PROFILE DDH BL 1	
Author	CJC	Dept. TAS	Scale 1:1000
Drawn	OH	Date 2/89	Revised
Checked		Date	S'ced
Sheet No.	Fig 4	Drawing No.	D/LD 57/004



SHELL COMPANY OF AUSTRALIA

METALS DIVISION

R.O.C.S. - PROTEM

BASIN LAKE  
GROUND MAG  
BASE LEV. 62300nT  
100nT/cm

SCALE 1 : 10000

FIG No : 5

DATE : 7/88

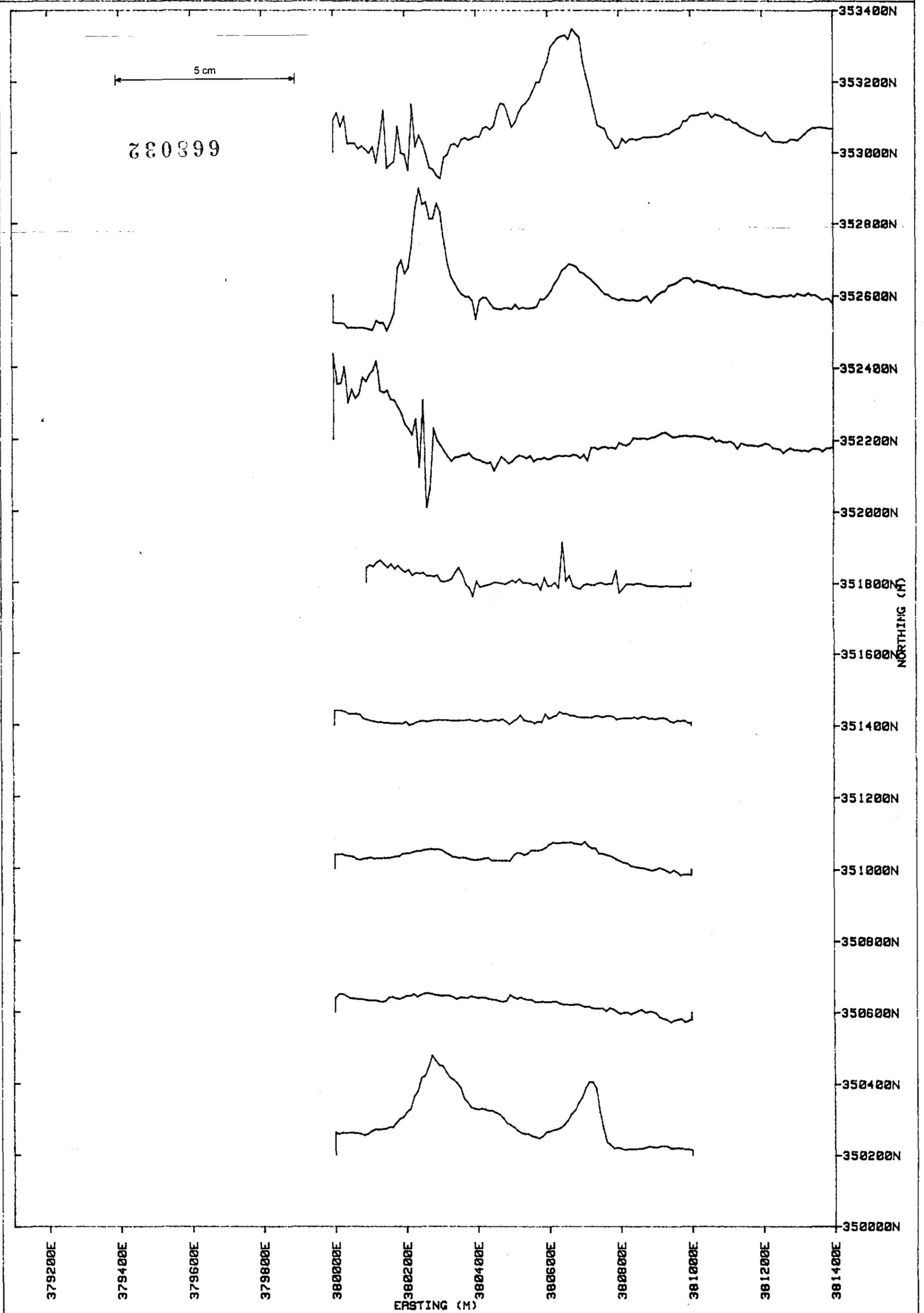
AUTHOR :

OFFICE :

DRAWN :

LEGEND

2x 4856



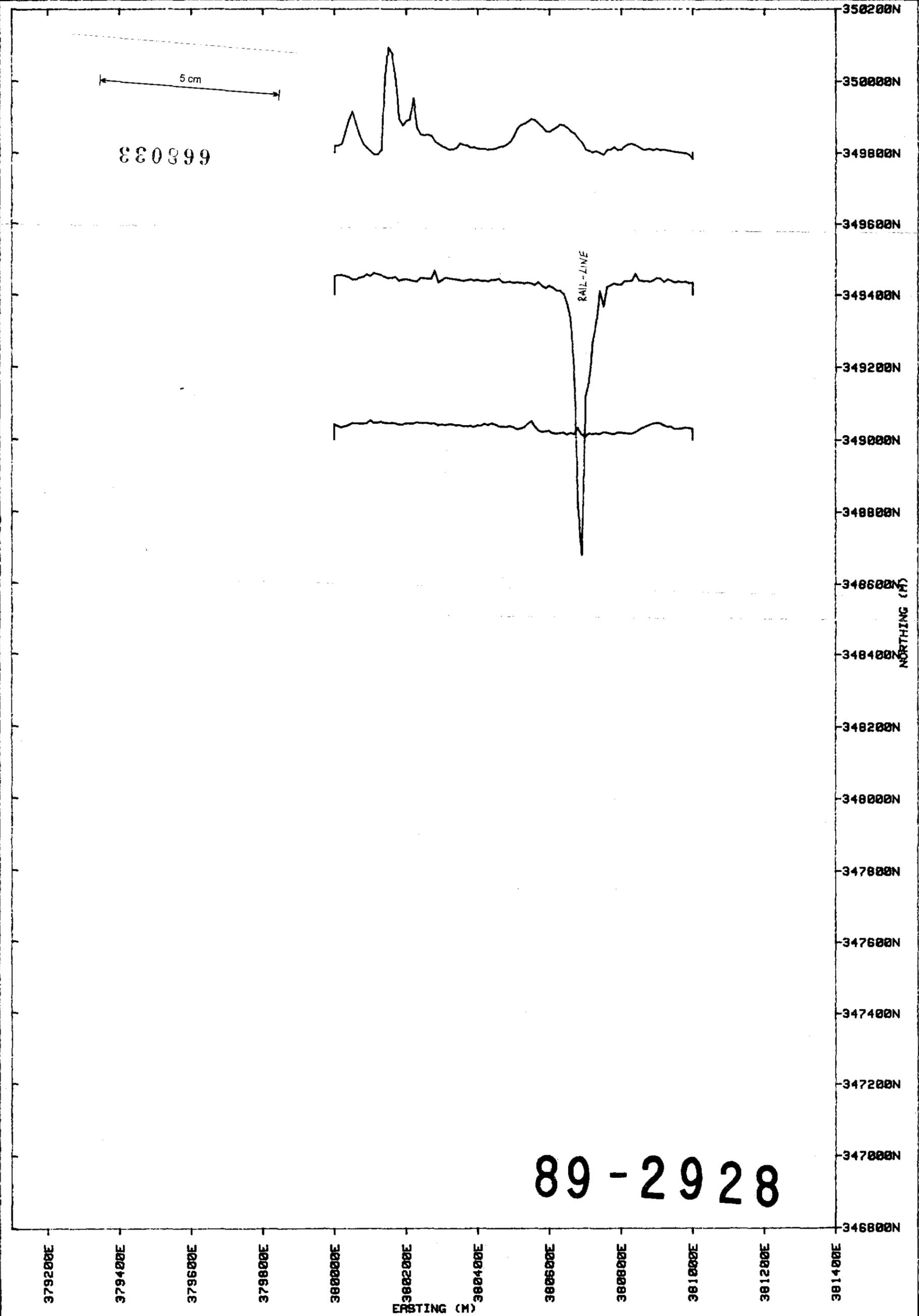
89-2928



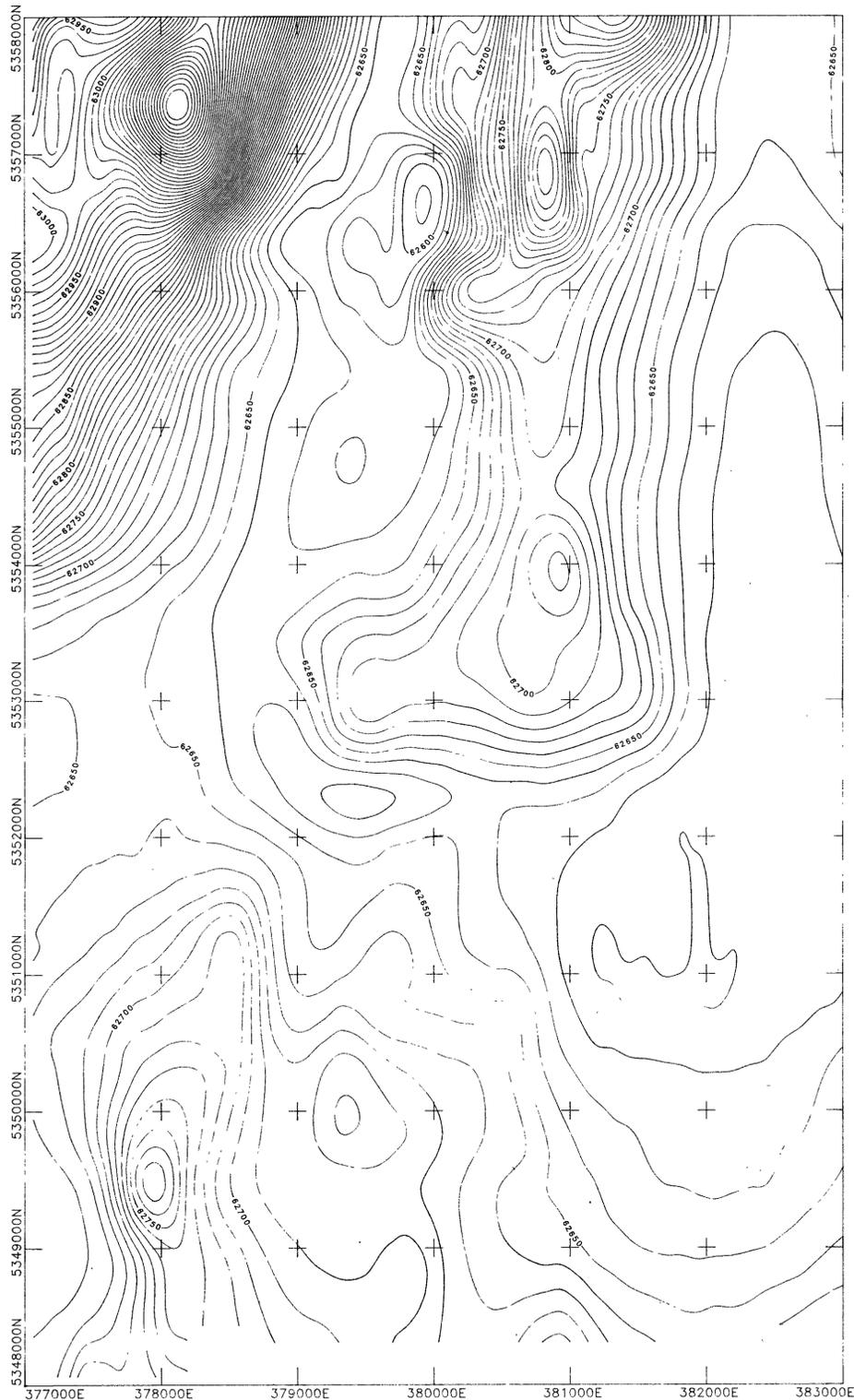
SHELL COMPANY OF AUSTRALIA  
 METALS DIVISION  
 R.O.C.S. - PROTEM

BASIN LAKE  
 GROUND MAG  
 BASE LEV. 62300nT  
 100nT/cm  
 SCALE 1 : 10000

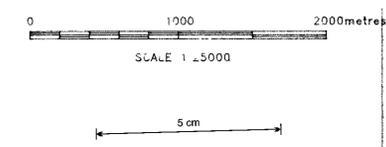
FIG No :	6	LEGEND
DATE :	7/82	2x G 856
AUTHOR :		
OFFICE :		
DRAWN :		



62



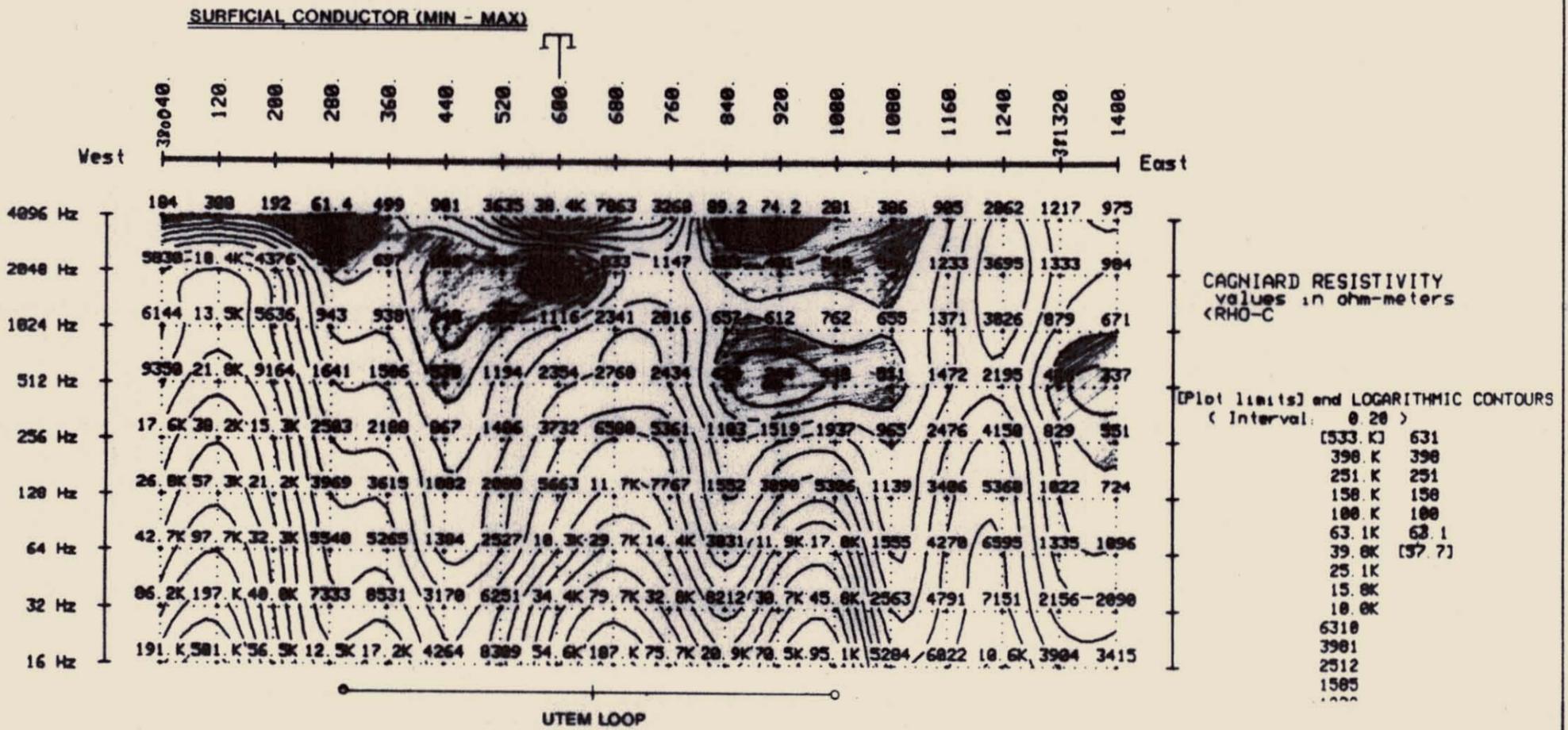
Flown by Department of Mines, Tasmania, 1981  
 Flight line spacing = 500m.  
 Mean sensor height = 135m.  
 Grid mesh = 200 x 200m



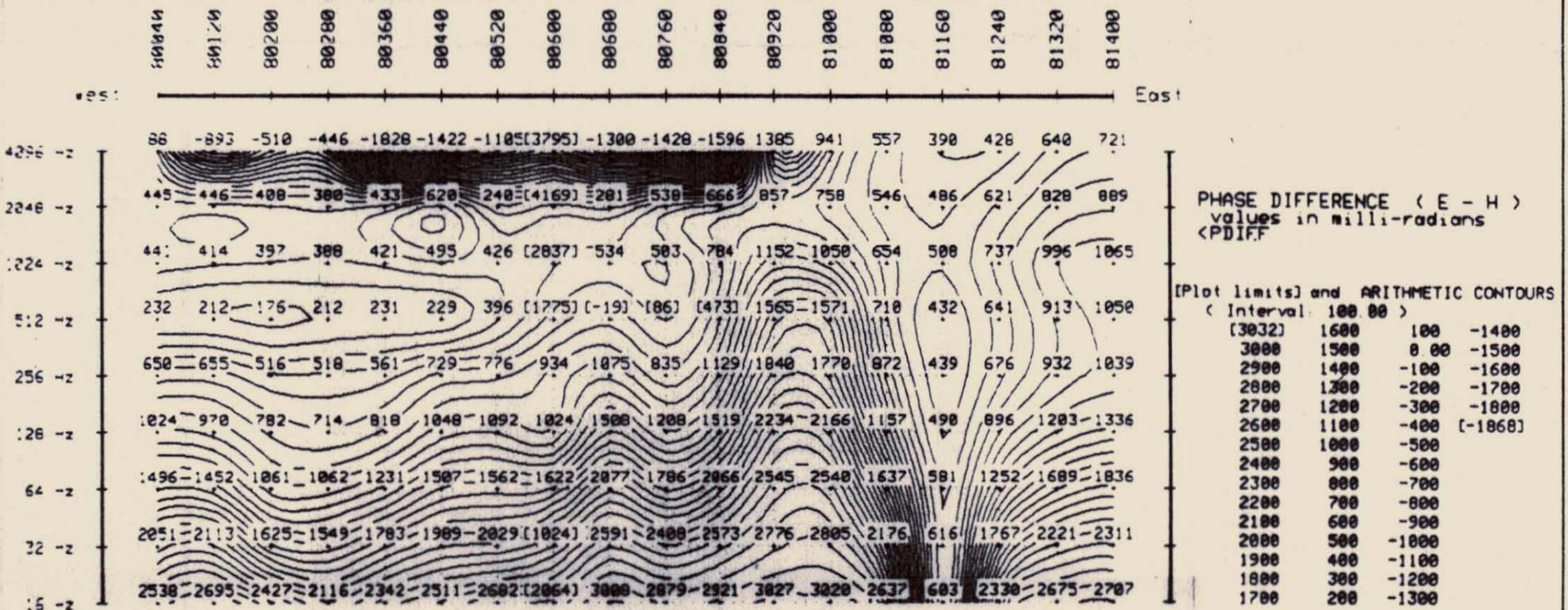
668034  
**89-2928**

BILLITON AUSTRALIA	
<small>The Metals Division of the Shell Company of Aust.</small>	
NW TASMANIA	
BASIN LAKE AEROMAG	
Contour Interval 10 nT	
Fig 7	
DATE 15-SEP-88	PLAN NO. LD57/1015

# CAGNIARD RESISTIVITY



# PHASE DIFFERENCE (E - H)



**Billion Australia**  
The Metals Division of the Steel Company of Australia Limited

Project: **BASIN LAKE**

Title: **CSAMT SURVEY DATA**  
**LINE 353000**

Author: N.H. Date: 2/88 Scale: 1:8 000

Drawn: H.S. Office: AHO Revised: Date:

Drawing No.: LD67/1022 Fig. No.: 9

DATE OF SURVEY = NOVEMBER 1988

Rx to Tx = NORTH

DISTANCE = 7km

ORIENT = EAST - WEST

LENGTH = 1500M

TRANSMITTER DATA

ELECTRIC DIPOLE ORIENT = EAST - WEST

SURVEY LINE ORIENT = EAST - WEST

STN. SPACING = 80m

DIPOLE LENGTH = 90m

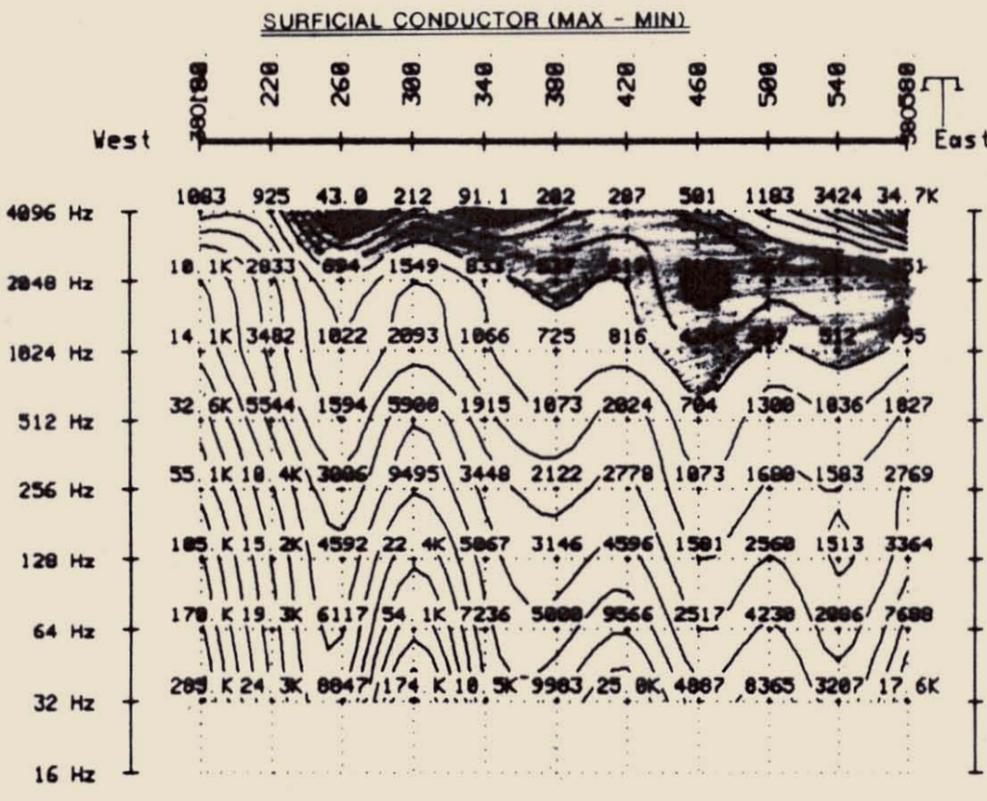
RECEIVER DATA:

5 cm

668035

89 - 2928

# CAGNIARD RESISTIVITY

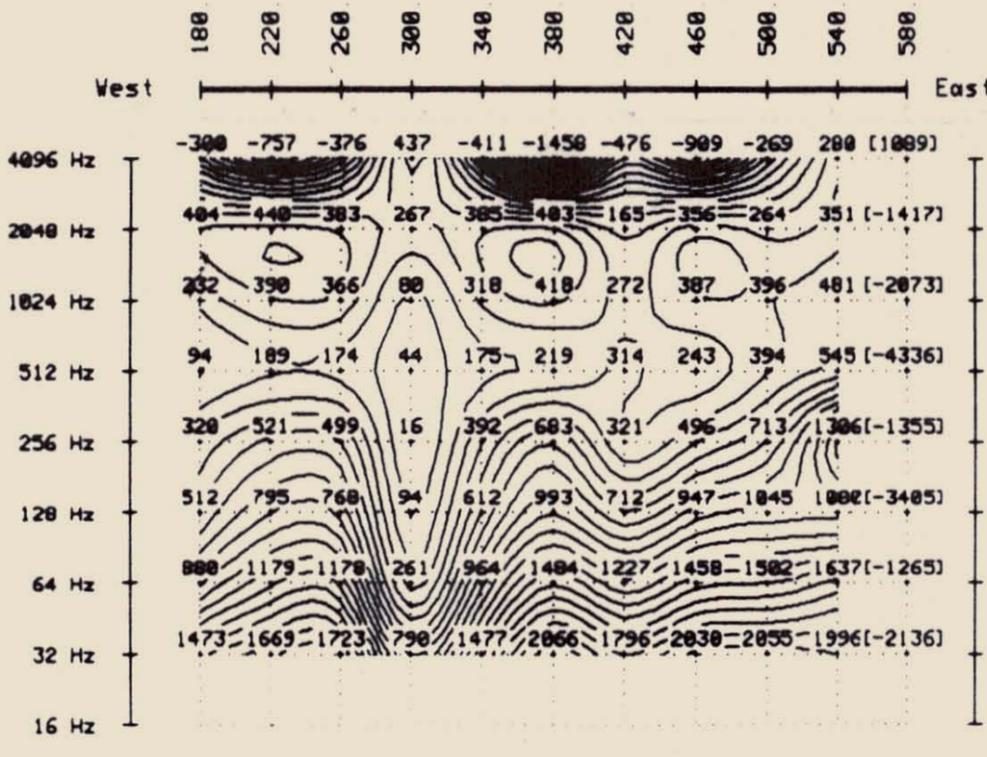


CAGNIARD RESISTIVITY  
values in ohm-meters  
<RHO-C

[Plot limits] and LOGARITHMIC CONTOUR:  
( Interval: 0.20 )

[205.K]	390
251.K	251
150.K	150
100.K	100
63.1K	63.1
39.0K	[43.0]
25.1K	
15.0K	
10.0K	
6310	
3901	
2512	
1505	
1000	
631	

# PHASE DIFFERENCE (E - H)



PHASE DIFFERENCE (E - H)  
values in milli-radians  
<PDIFF

[Plot limits] and ARITHMETIC CONTOURS  
( Interval: 100.00 )

[2067]	600	-900
2000	500	-1000
1900	400	-1100
1800	300	-1200
1700	200	-1300
1600	100	-1400
1500	0.00	[-1450]
1400	-100	
1300	-200	
1200	-300	
1100	-400	
1000	-500	
900	-600	
800	-700	
700	-800	

**Billiton Australia**  
The Mineral Division of the Steel Company of Australia Limited

Project: PASIN LAKE

Title: CSAMT SURVEY DATA  
LINE 353000 (RPT)

Author: N.H. Date: 2/89 Scale: 1:4 000

Drawn: H.S. Office: AHO Revised: Date:

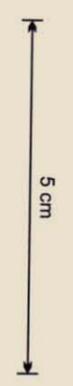
Drawing No.: LD67/1020 Fig. No.: 9

DATE OF SURVEY = NOVEMBER 1988

RECEIVER DATA:  
DIPOLE LENGTH = 40.0m  
STN. SPACING = 40.0m

SURVEY LINE ORIENT = EAST - WEST  
ELECTRIC DIPOLE ORIENT = EAST - WEST

TRANSMITTER DATA  
LENGTH = 1500M  
ORIENT = EAST - WEST  
DISTANCE = 7km  
Rx to Tx = NORTH

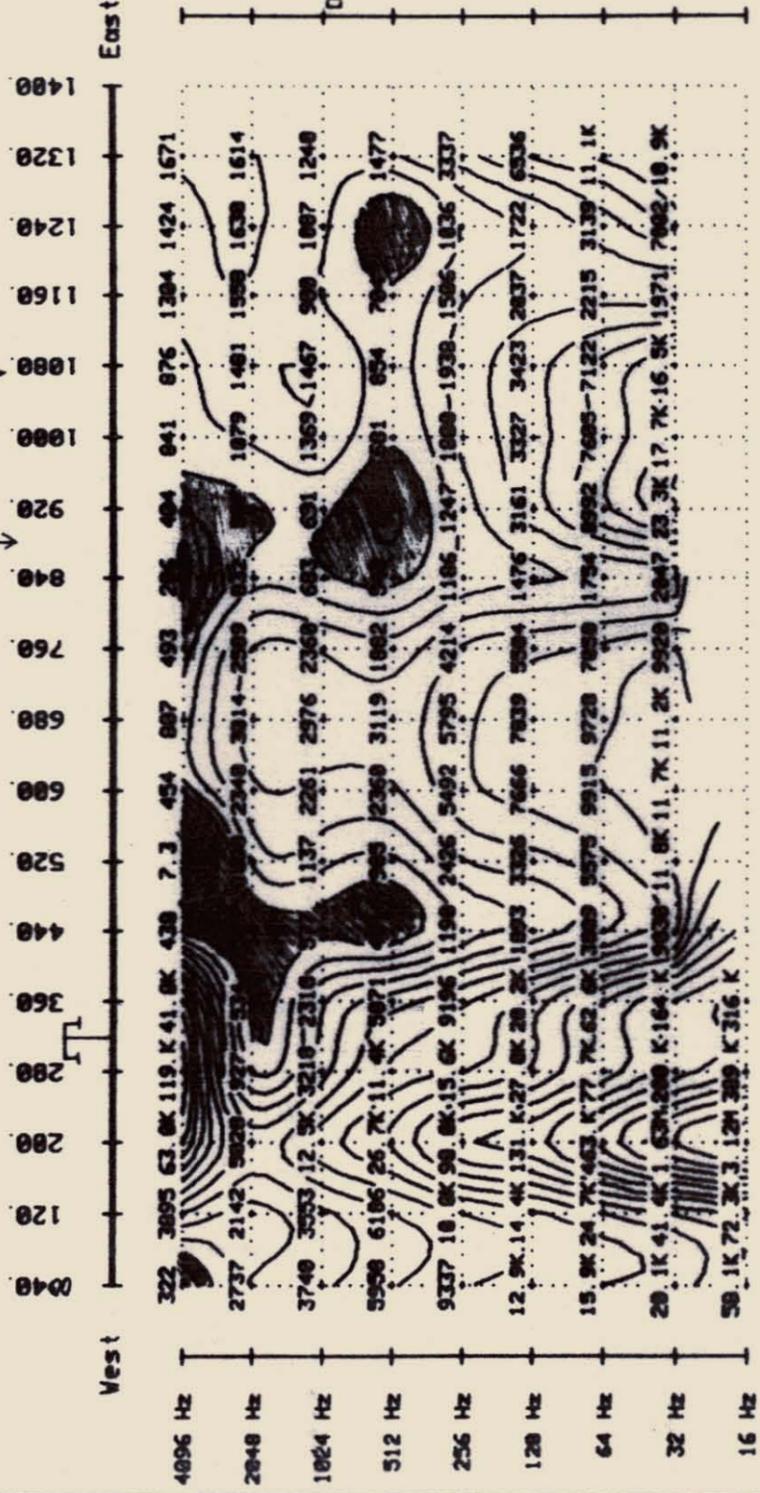


668036

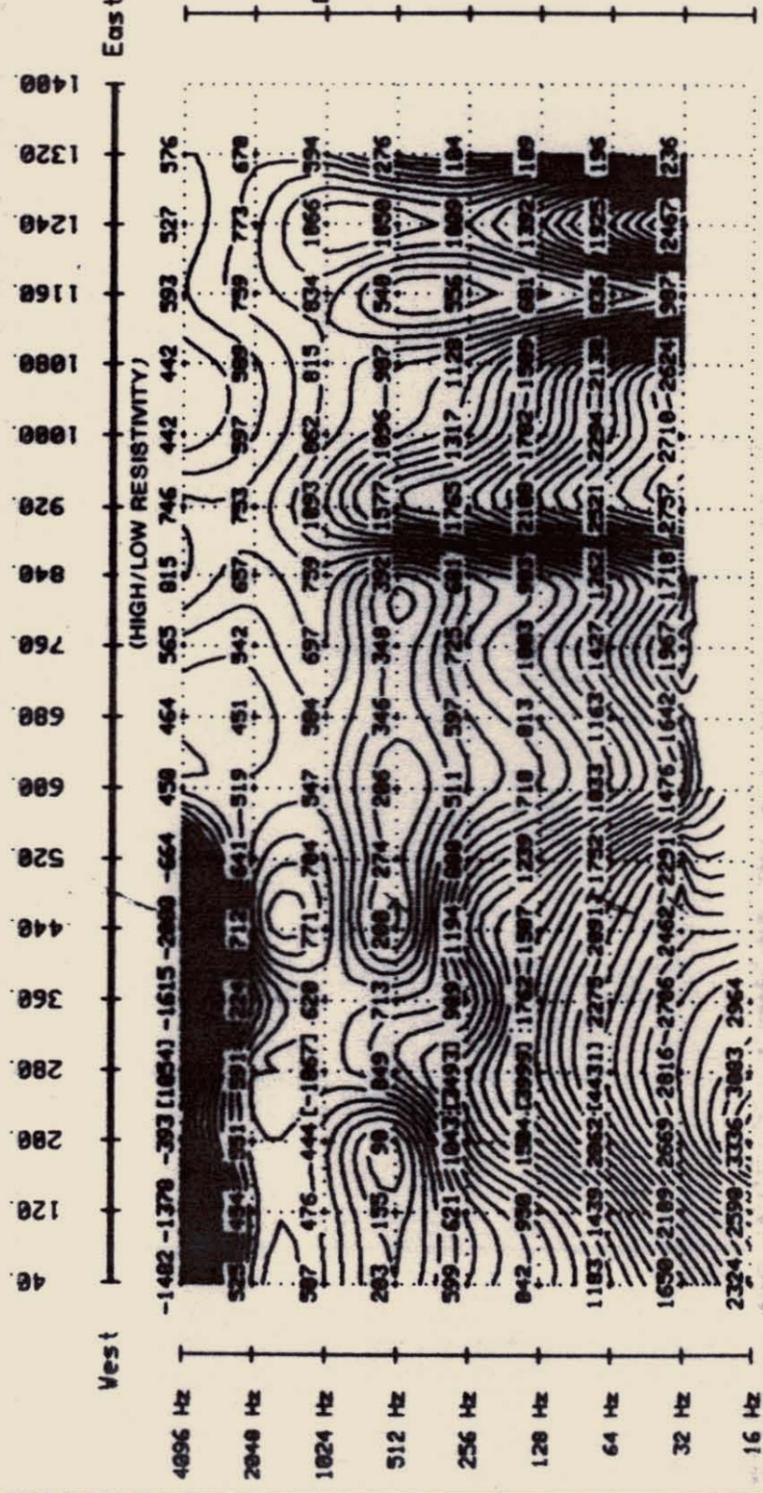
89 - 2928

**CAGNIARD RESISTIVITY**

MAX-MIN & UTEM ANOMALY



**PHASE DIFFERENCE (E - H)**

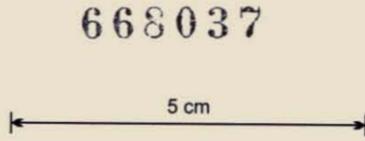


<b>Billiton Australia</b> The Metals Division of the Shell Company of Australia Limited			
Project	BASIN LAKE		
Title	CSAMT SURVEY DATA LINE 352600		
Author	N.H.	Date	2/89
Scale	1:8 000		
Drawn	H.S.	Office	AHO
Revised	Date		
Drawing No.	LD57/1021		Fig. No. 10

RECEIVER DATA:  
 DIPOLE LENGTH= 80m  
 STN. SPACING= 80m  
 SURVEY LINE ORIENT= EAST-WEST  
 ELECTRIC DIPOLE ORIENT= EAST-WEST

TRANSMITTER DATA  
 LENGTH= 1500M  
 ORIENT= EAST-WEST  
 DISTANCE= 7km  
 Rx to Tx= NORTH

DATE OF SURVEY= NOVEMBER 1988

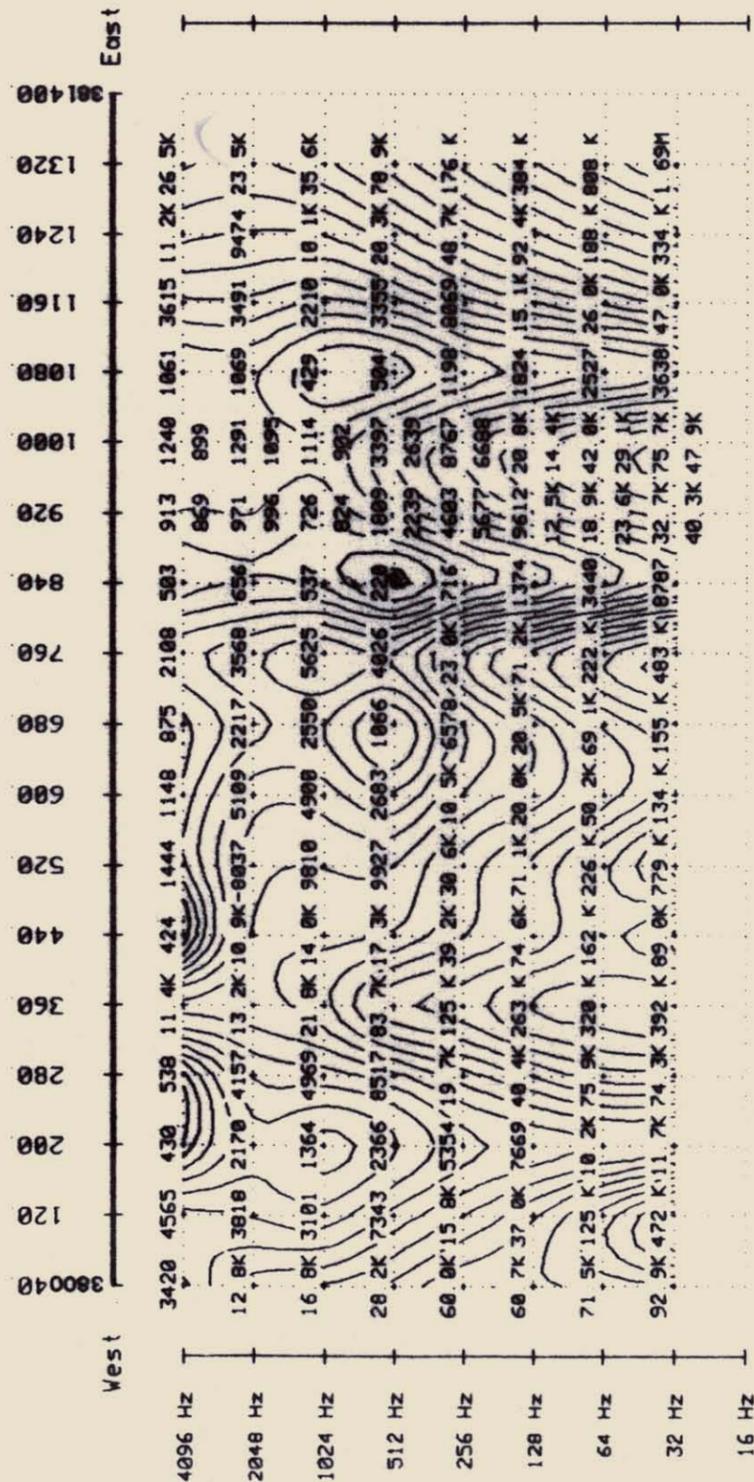


668037

89 - 2928

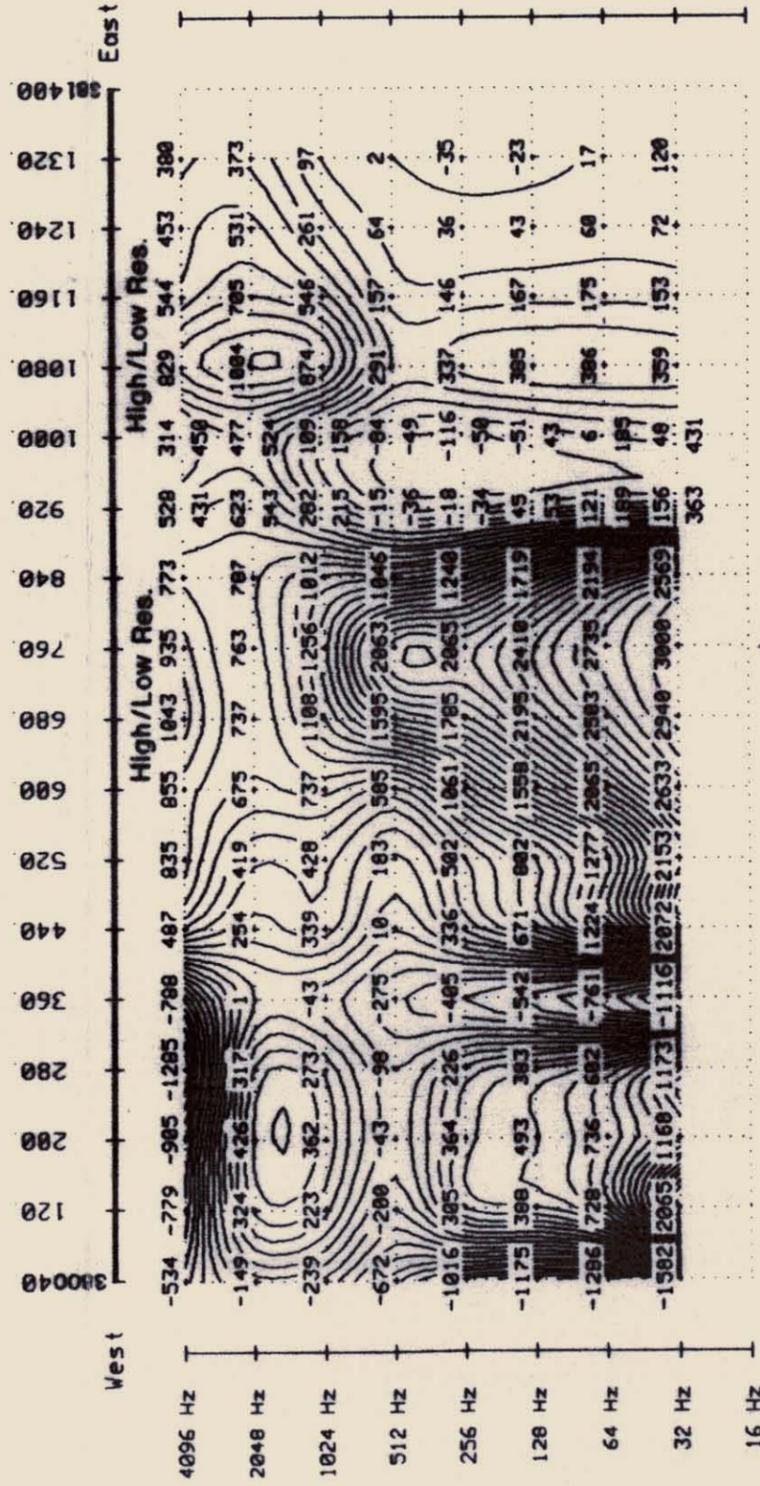
**CAGNIARD RESISTIVITY**

values in ohm-metres



**PHASE DIFFERENCE (E-H)**

values in milli-radians



5 cm

RECEIVER DATA:  
 DIPOLE LENGTH= 80m  
 STN. SPACING= 80m  
 SURVEY LINE ORIENT= EAST-WEST  
 ELECTRIC DIPOLE ORIENT= EAST -WEST

TRANSMITTER DATA  
 LENGTH= 1500m  
 ORIENT= EAST-WEST  
 DISTANCE= 7km  
 Rx to Tx= NORTH

DATE OF SURVEY= NOVEMBER 1988

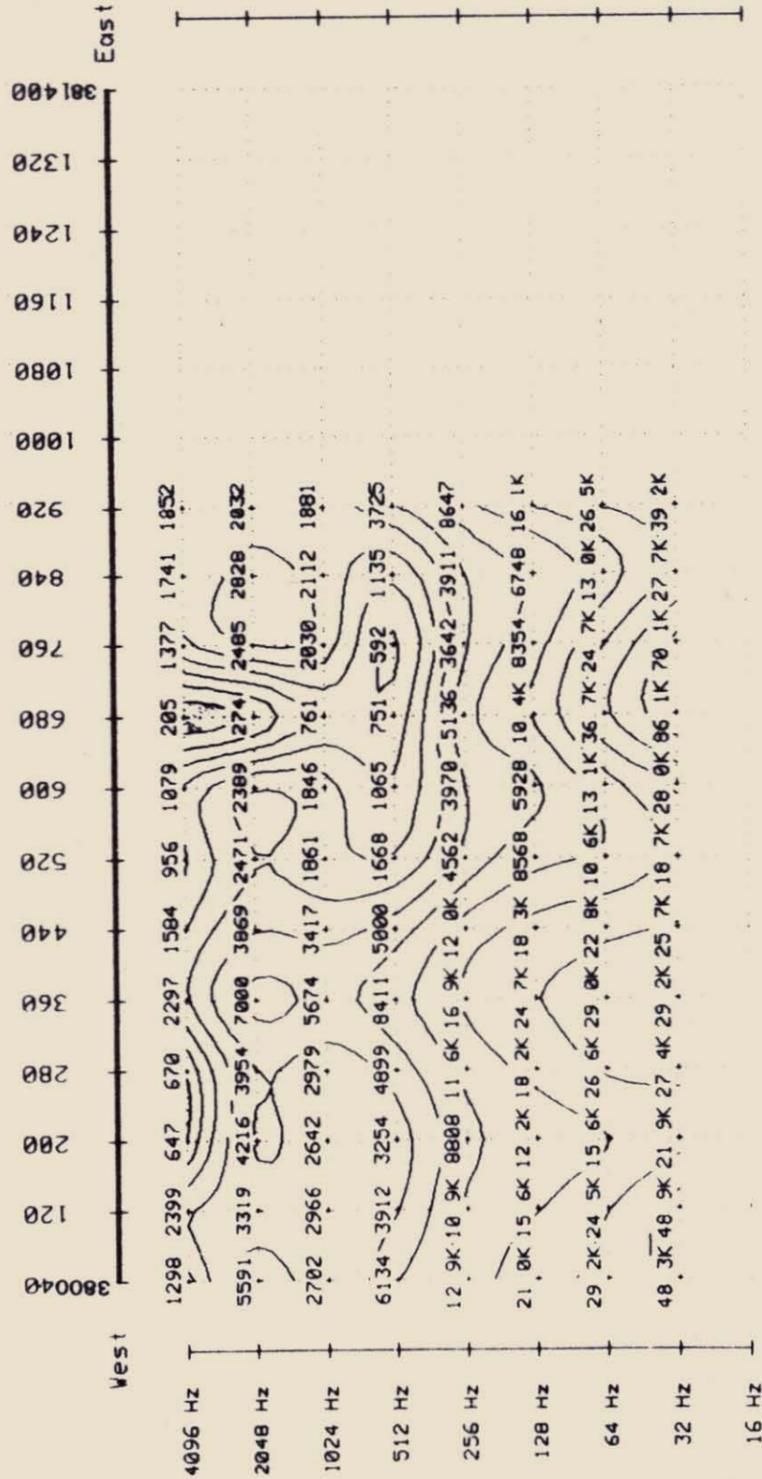
668038

Project	BASIN LAKE		
Title	<b>CSAMT SURVEY DATA</b> <b>LINE 352 200N</b>		
Author	N.H.	Date	3/89
Scale	1: 8000		
Drawn	H.S.	Office	AHO
Revised	Date		
Drawing No.	LD57/1029		Fig. No. //

89-2928

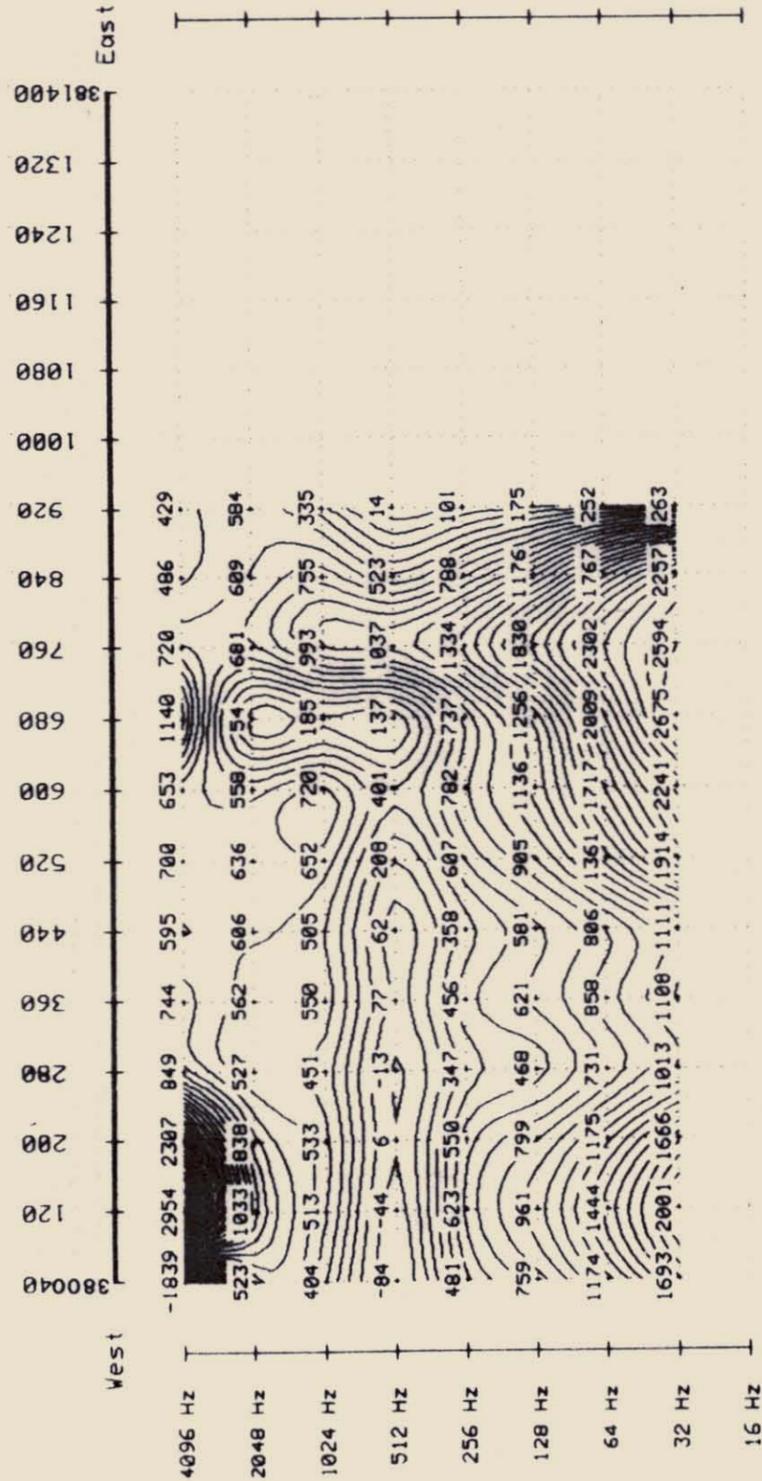
**CAGNIARD RESISTIVITY**

values in ohm-metres



**PHASE DIFFERENCE (E-H)**

values in milli-radians



5 cm

RECEIVER DATA:

DIPOLE LENGTH= 80m  
STN. SPACING= 80m

SURVEY LINE ORIENT= EAST -WEST  
ELECTRIC DIPOLE ORIENT= EAST -WEST

TRANSMITTER DATA

LENGTH= 1500m  
ORIENT= EAST -WEST  
DISTANCE= 7km  
Rx to Tx= NORTH

DATE OF SURVEY= NOVEMBER 1988

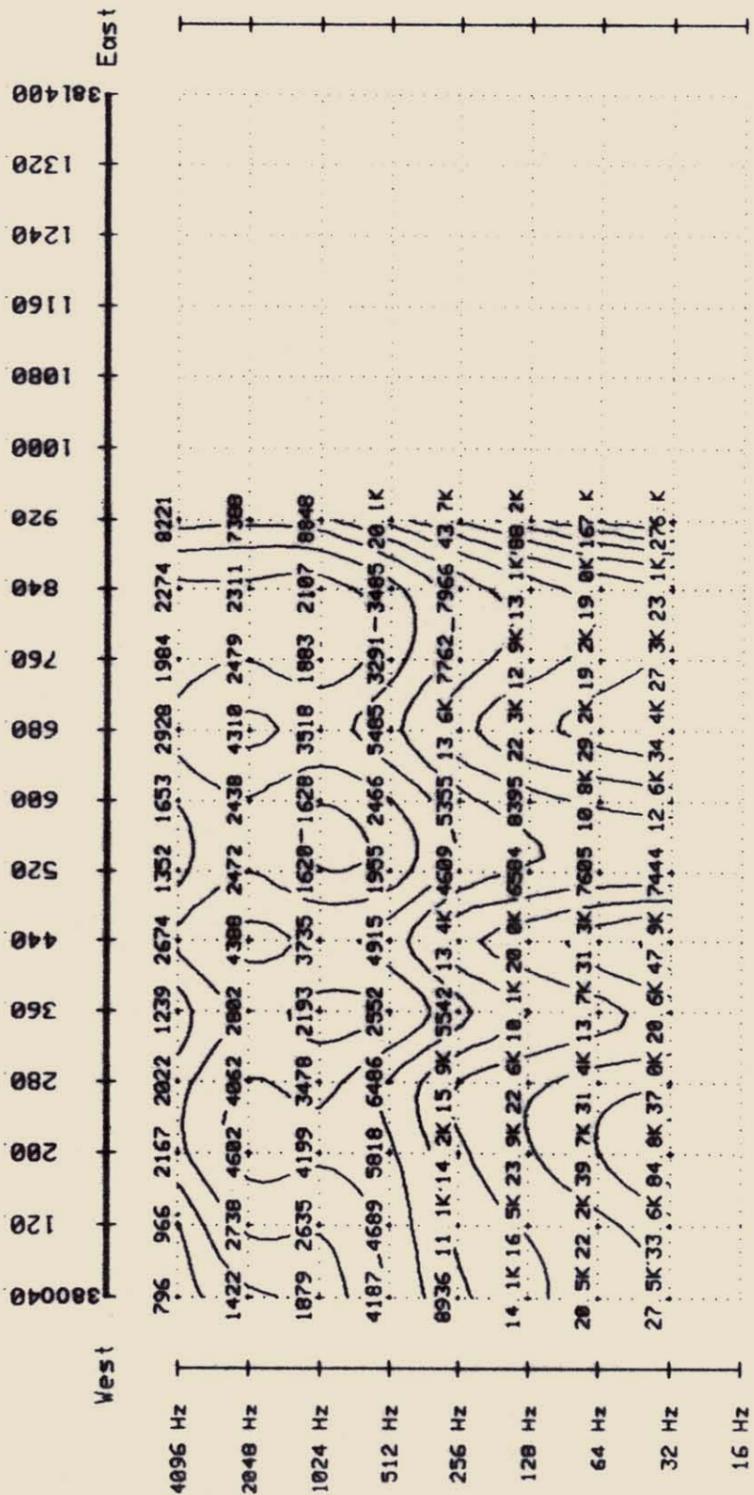
668039

<p>The Metals Division of the Shell Company of Australia Limited</p>			
Project	BASIN LAKE		
Title	<b>CSAMT SURVEY DATA</b> <b>LINE 351 800N</b>		
Author	N.H.	Date	3/89
Scale	1:8000		
Drawn	H.S.	Office	AHO
Revised			Date
Drawing No	LD57/1030		Fig. No. 12

89-2928

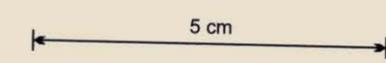
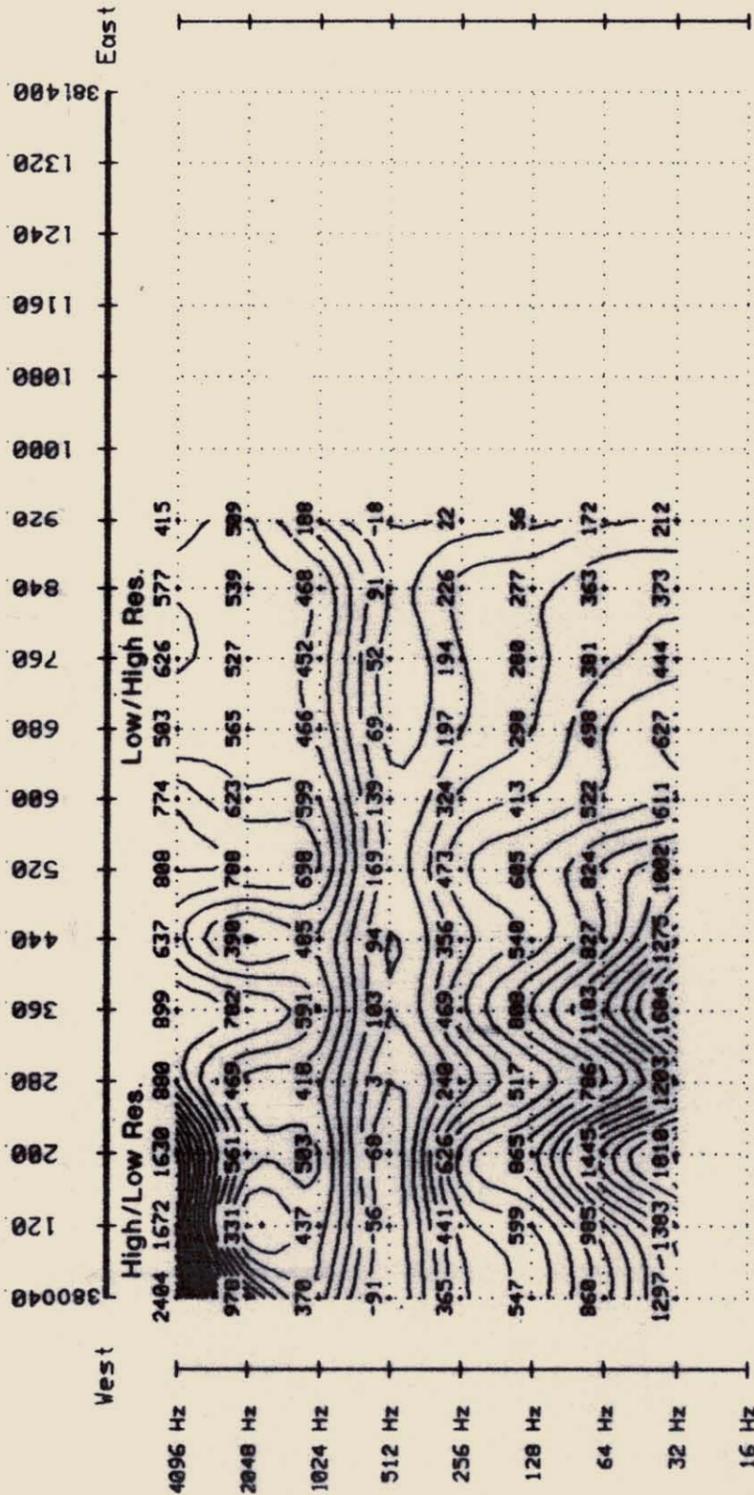
**CAGNIARD RESISTIVITY**

values in ohm-metres



**PHASE DIFFERENCE (E-H)**

values in milli-radians



**RECEIVER DATA:**  
 DIPOLE LENGTH= 80m  
 STN. SPACING= 80m  
**SURVEY LINE ORIENT= EAST-WEST**  
**ELECTRIC DIPOLE ORIENT= EAST -WEST**

**TRANSMITTER DATA**  
 LENGTH= 1500m  
 ORIENT= EAST-WEST  
 DISTANCE= 7km  
 Rx to Tx= NORTH

**DATE OF SURVEY= NOVEMBER 1988**

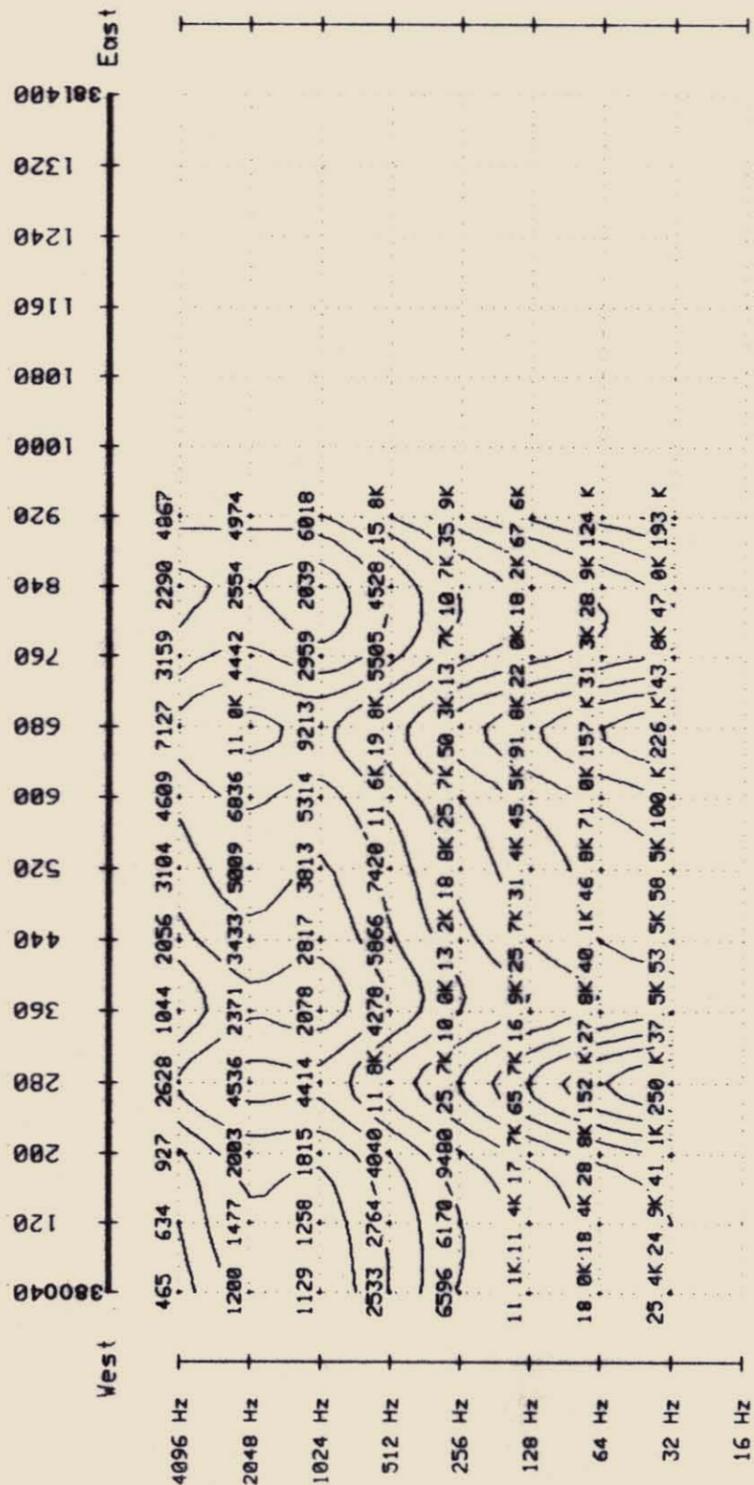
668040

Project <b>BASIN LAKE</b>			
Title <b>CSAMT SURVEY DATA</b> <b>LINE 351 400N</b>			
Author <b>N.H.</b>	Date <b>3/89</b>	Scale <b>1:8000</b>	
Drawn <b>H.S.</b>	Office <b>AHO</b>	Revised	Date
Drawing No. <b>LD57/103I</b>			Fig. No. <b>13</b>

89-2928

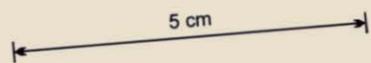
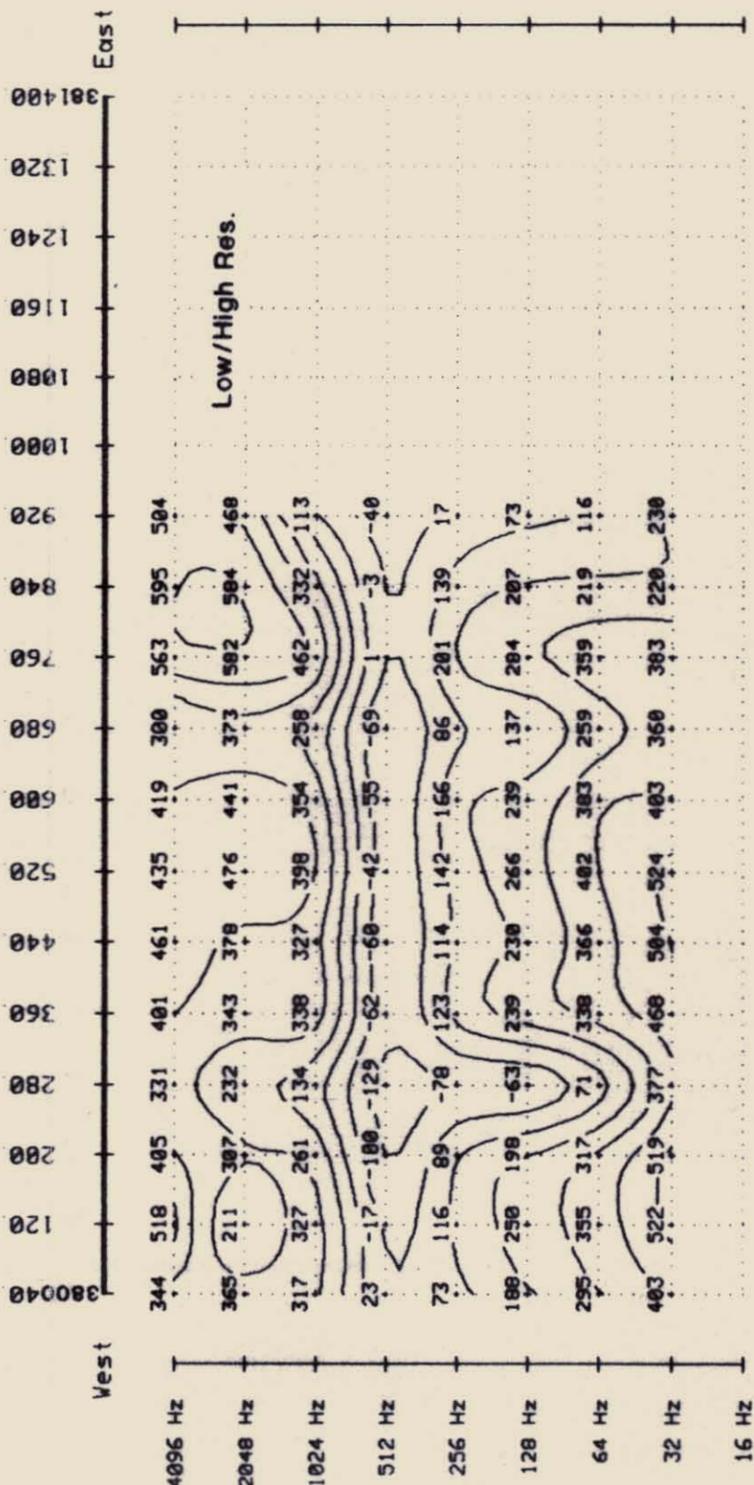
**CAGNIARD RESISTIVITY**

values in ohm-metres



**PHASE DIFFERENCE (E-H)**

values in milli-radians



**RECEIVER DATA:**  
 DIPOLE LENGTH= 80m  
 STN. SPACING= 80m  
**SURVEY LINE ORIENT= EAST-WEST**  
**ELECTRIC DIPOLE ORIENT= EAST-WEST**

**TRANSMITTER DATA**  
 LENGTH= 1500m  
 ORIENT= EAST-WEST  
 DISTANCE= 7km  
 Rx to Tx= NORTH

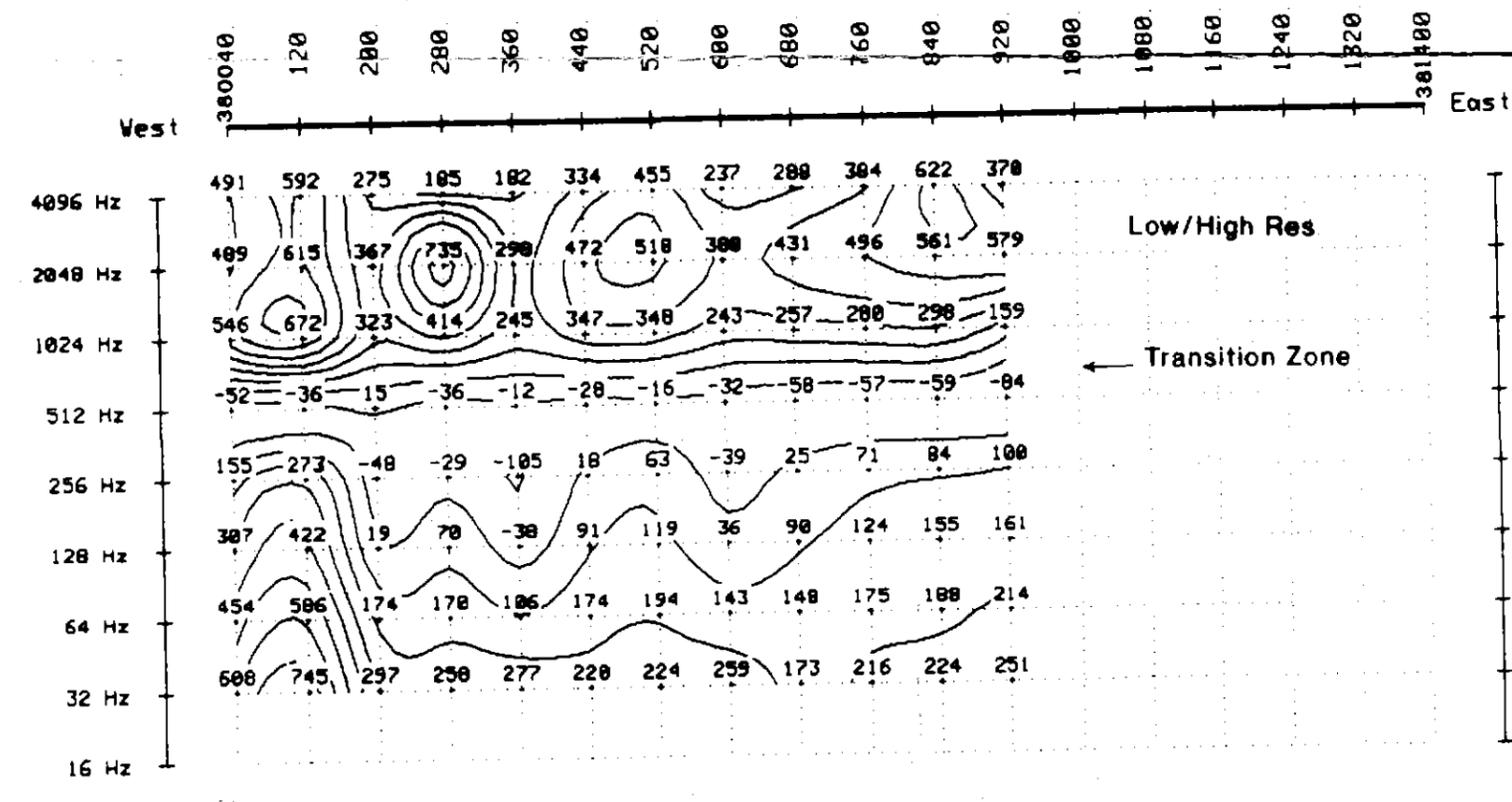
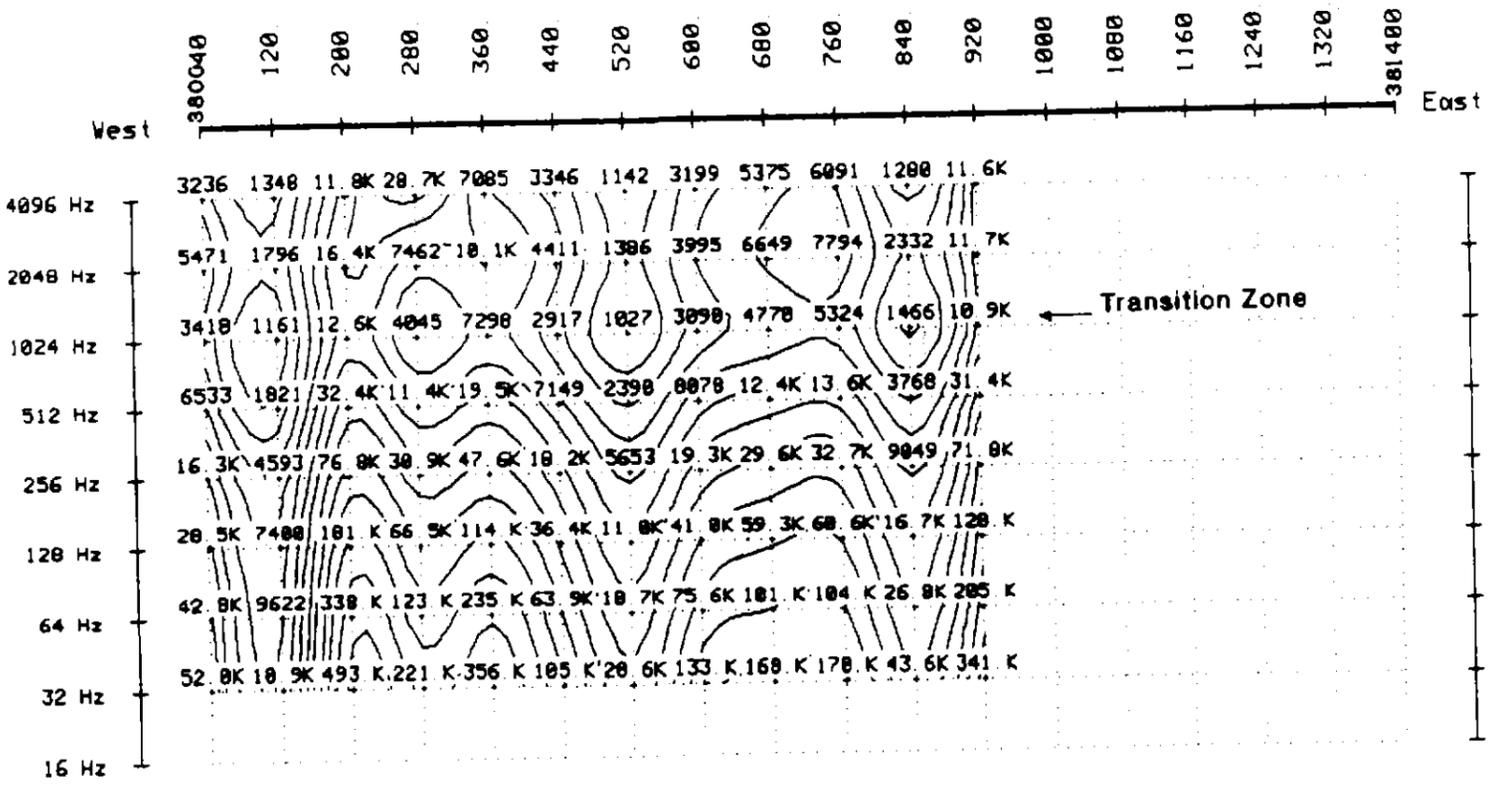
DATE OF SURVEY= NOVEMBER 1988

668041

Project <b>BASIN LAKE</b>			
Title <b>CSAMT SURVEY DATA</b> <b>LINE 351 000N</b>			
Author <b>N.H.</b>	Date <b>3/89</b>	Scale <b>1:8000</b>	
Drawn <b>H.S.</b>	Office <b>AHO</b>	Revised	Date
Drawing No. <b>LD57/1032</b>			Fig. No. <b>14</b>

89-2928





**Billiton Australia**  
The World's Division of the Shell Company of Australia Limited

**Project**  
BASIN LAKE

**Title**  
CSAMT SURVEY DATA  
LINE 360 200N

**Author** N.H. **Date** 3/89 **Scale** 1:3000

**Drawn** H.S. **Office** AHO **Revised** **Date**

**Drawing No.** LD57/1034 **Fig No.** 1/6

668043

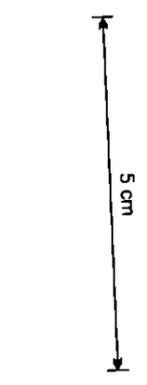
DATE OF SURVEY = NOVEMBER 1988

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DIPOLE LENGTH = 80m  
STN. SPACING = 80m

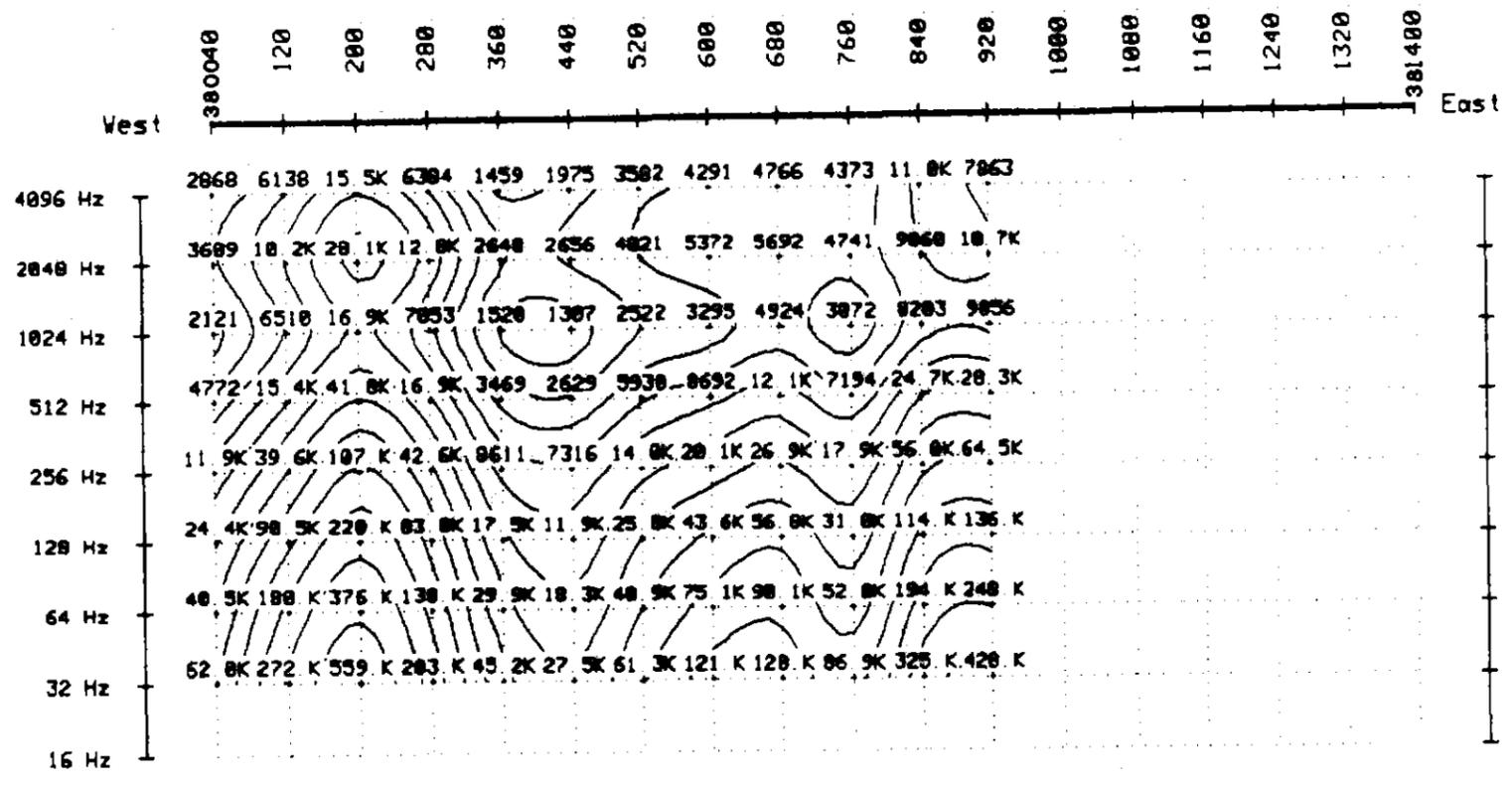
**SURVEY LINE ORIENT = EAST-WEST**

**ELECTRIC DIPOLE ORIENT = EAST-WEST**

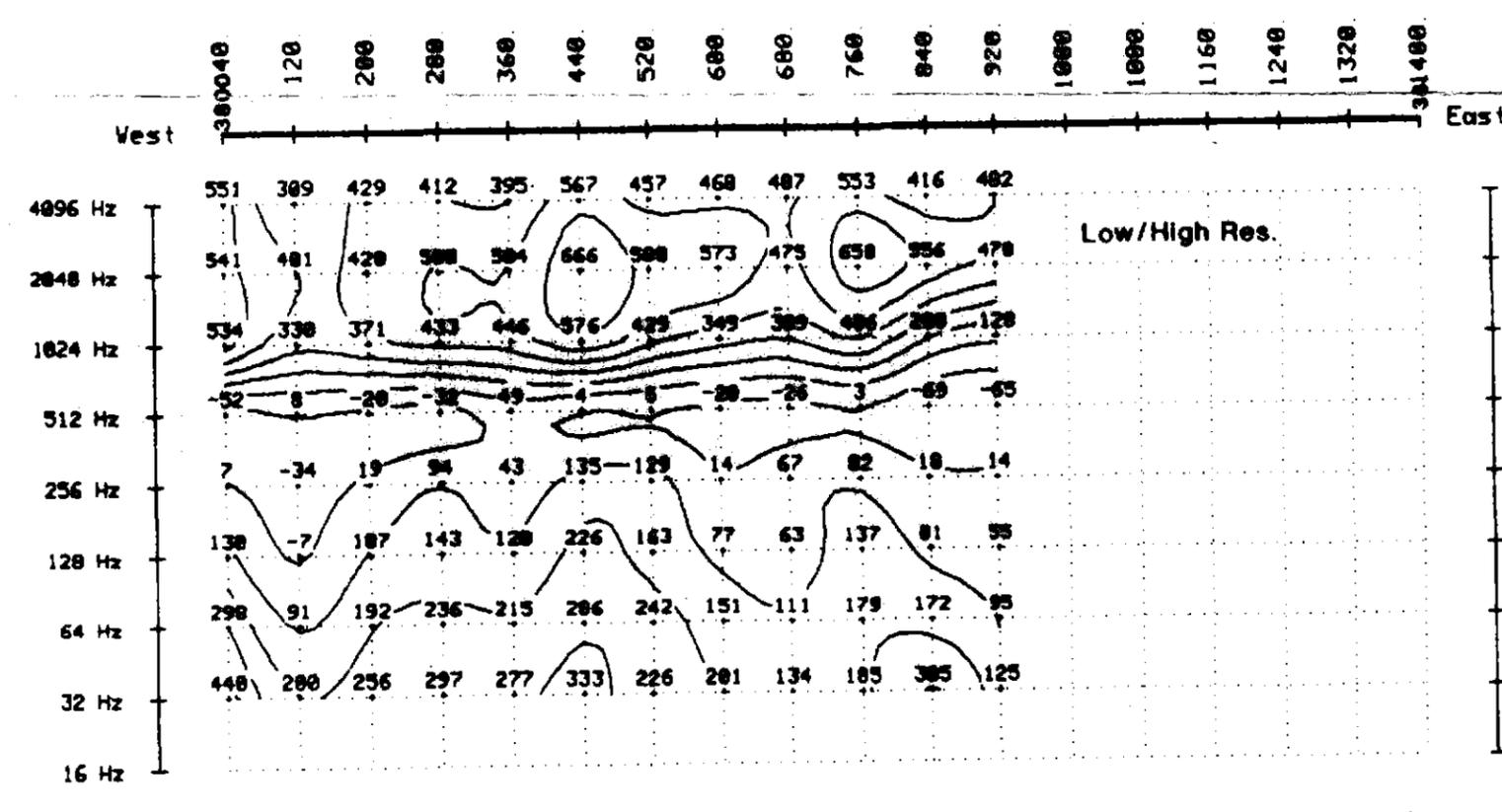
**TRANSMITTER DATA**  
LENGTH = 1500m  
ORIENT = EAST-WEST  
DISTANCE = 7km  
Rx to Tx = NORTH



89-2928



**CAGNIARD RESISTIVITY**  
values in ohm-metres



**PHASE DIFFERENCE (E-H)**  
values in milliradians

5 cm

**89 - 2928**

**RECEIVER DATA:**  
 DIPOLE LENGTH = 80m  
 STN. SPACING = 80m

**SURVEY LINE ORIENT = EAST-WEST**

**ELECTRIC DIPOLE ORIENT = EAST-WEST**

**TRANSMITTER DATA**  
 LENGTH = 1600m  
 ORIENT = EAST-WEST  
 DISTANCE = 7km  
 RX TO TX = NORTH

DATE OF SURVEY = NOVEMBER 1988

668044

**Brimkom Australia**  
 The National Institute of Geoscientific and Geomatics Information Science

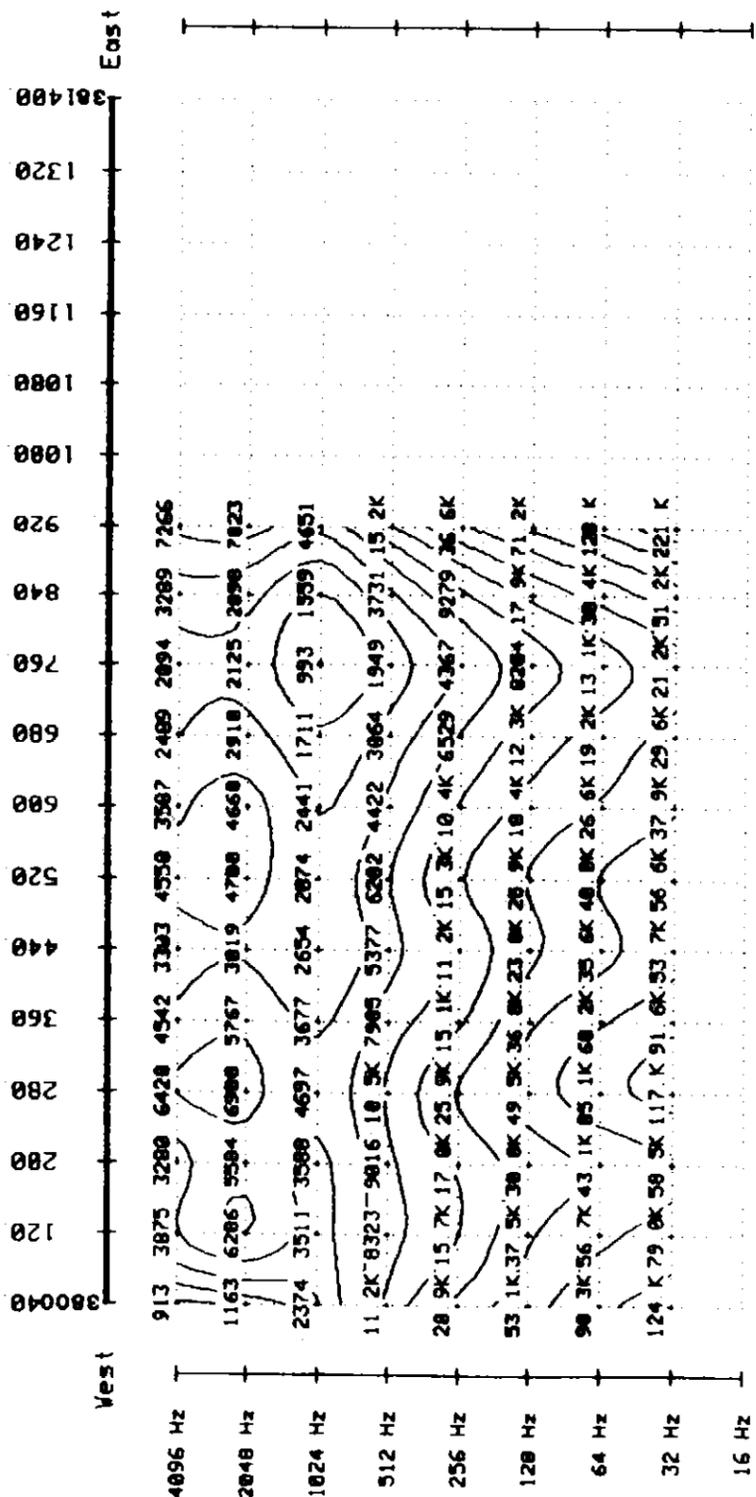
**Project**  
 BASIN LAKE

**Title**  
 CSAMT SURVEY DATA  
 LINE 349 800M

Author	N.H.	Date	3/89	Scale	1:5000
Drawn	H.S.	Office	AHQ	Revised	Date
Drawing No.	LD57/1035				
Fig No.	7				

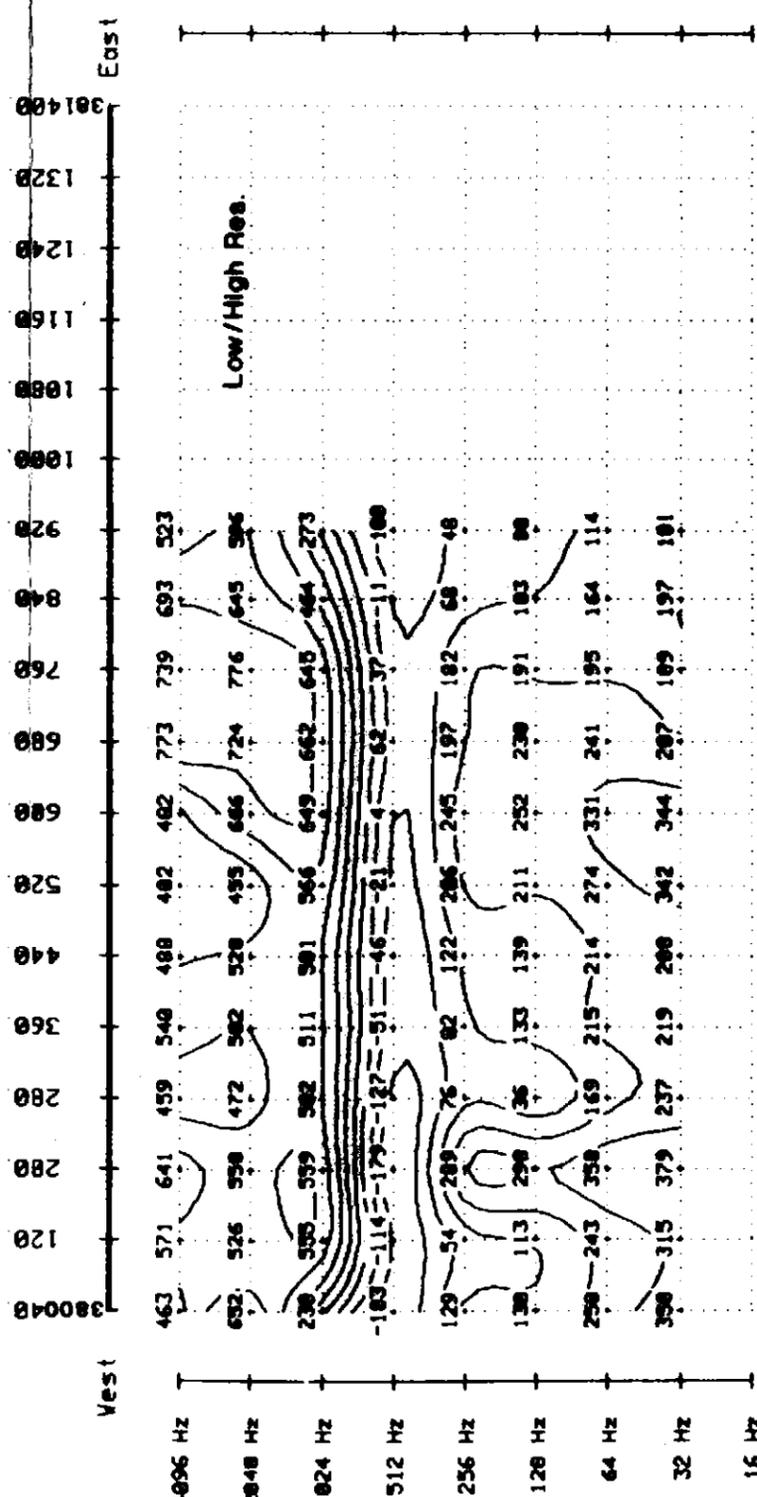
**CAGNIARD RESISTIVITY**

values in ohm-metres



**PHASE DIFFERENCE (E-H)**

values in mill-radians



5 cm

RECEIVER DATA:  
 DIPOLE LENGTH= 80m  
 STN. SPACING= 80m  
 SURVEY LINE ORIENT= EAST-WEST  
 ELECTRIC DIPOLE ORIENT= EAST-WEST

TRANSMITTER DATA  
 LENGTH= 1500m  
 ORIENT= EAST-WEST  
 DISTANCE= 7km  
 Rx to Tx= NORTH

DATE OF SURVEY= NOVEMBER 1988

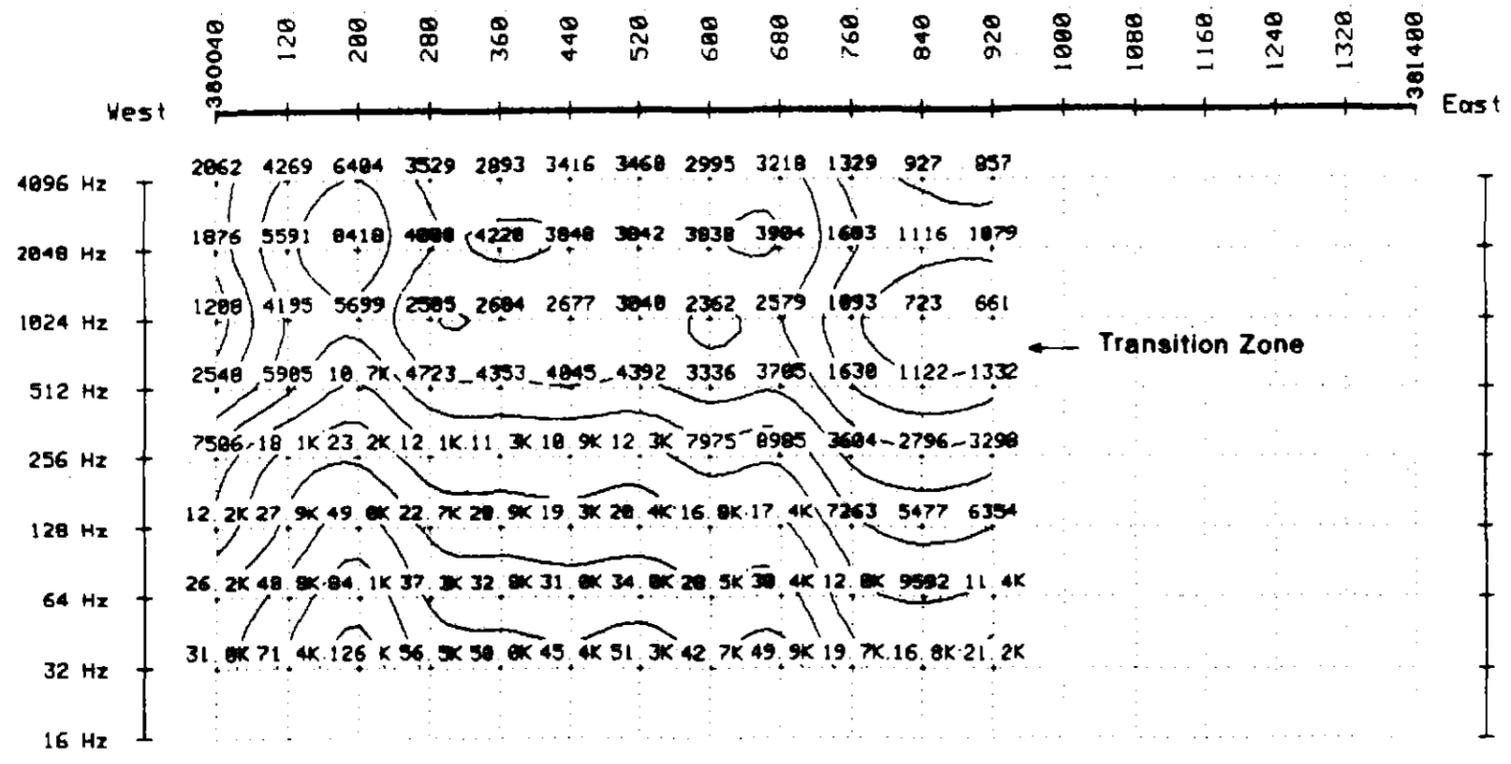
668045

Project		BASIN LAKE	
Title			
<b>CSAMT SURVEY DATA</b> <b>LINE 348 400N</b>			
Author	M.H.	Date	3/88
Scale	1:4000		
Drawn	H.S.	Office	AMO
Revised	Date		
Drawing No.	LD57/1036		Fig. No. / 8

89-2928

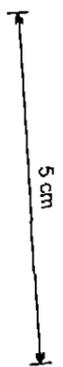
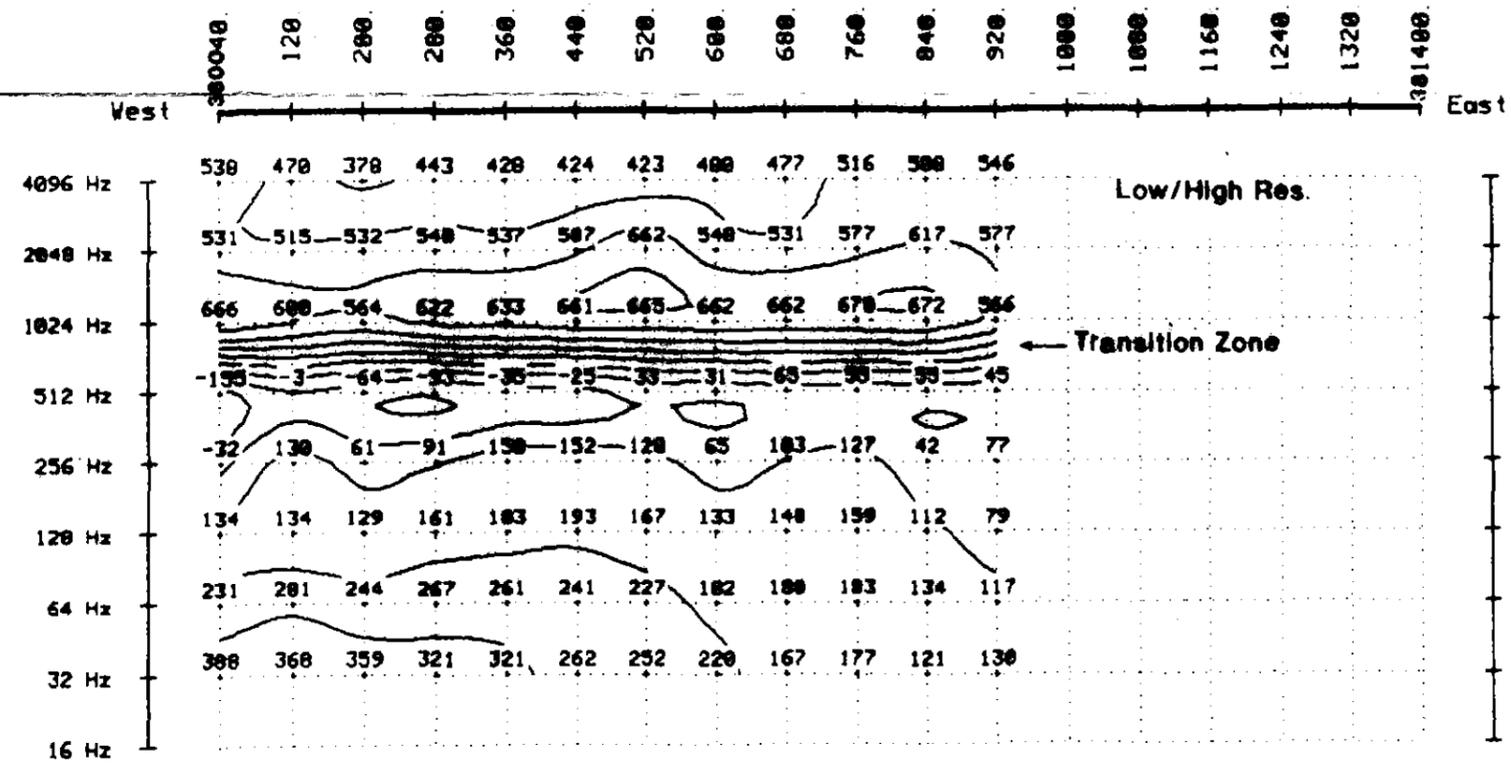
**CAGNIARD RESISTIVITY**

values in ohm-metres



**PHASE DIFFERENCE (E-H)**

values in milliradians



RECEIVER DATA:

DIPOLE LENGTH = 80m  
STN. SPACING = 80m

SURVEY LINE ORIENT = EAST-WEST

ELECTRIC DIPOLE ORIENT = EAST-WEST

TRANSMITTER DATA

LENGTH = 1600m  
ORIENT = EAST-WEST  
DISTANCE = 7km  
Rx to Tx = NORTH

DATE OF SURVEY = NOVEMBER 1988

668046



BASIN LAKE

**CSAMT SURVEY DATA**

LINE 949 000N

Author	N.H.	Date	3/88	Scale	1:5000	Date	
Drawn	H.S.	Office	AHO	Revised		Date	
Drawing No.	LD57/1037			Fig No.	19		

89 - 2928

42

222 Hz

+10%

0

-10%

+20%

+10%

888 Hz

0

-10%

-20%

668047

+10%

444 Hz

0

+10%

+10%

0

-10%

+20%

+10%

1777 Hz

0

-10%

-20%

5 cm

Depth = 45m  
Dip ≈ steep (?) east  
Conductivity x Thickness 12.5s

Depth = 33m  
Dip ≈ steep (?) east  
Conductivity x Thickness 12s

380875m E

GRAVITY ANOMALY

380325 380425 380525 380625 380725 380825 380925 381025 381125 381225E

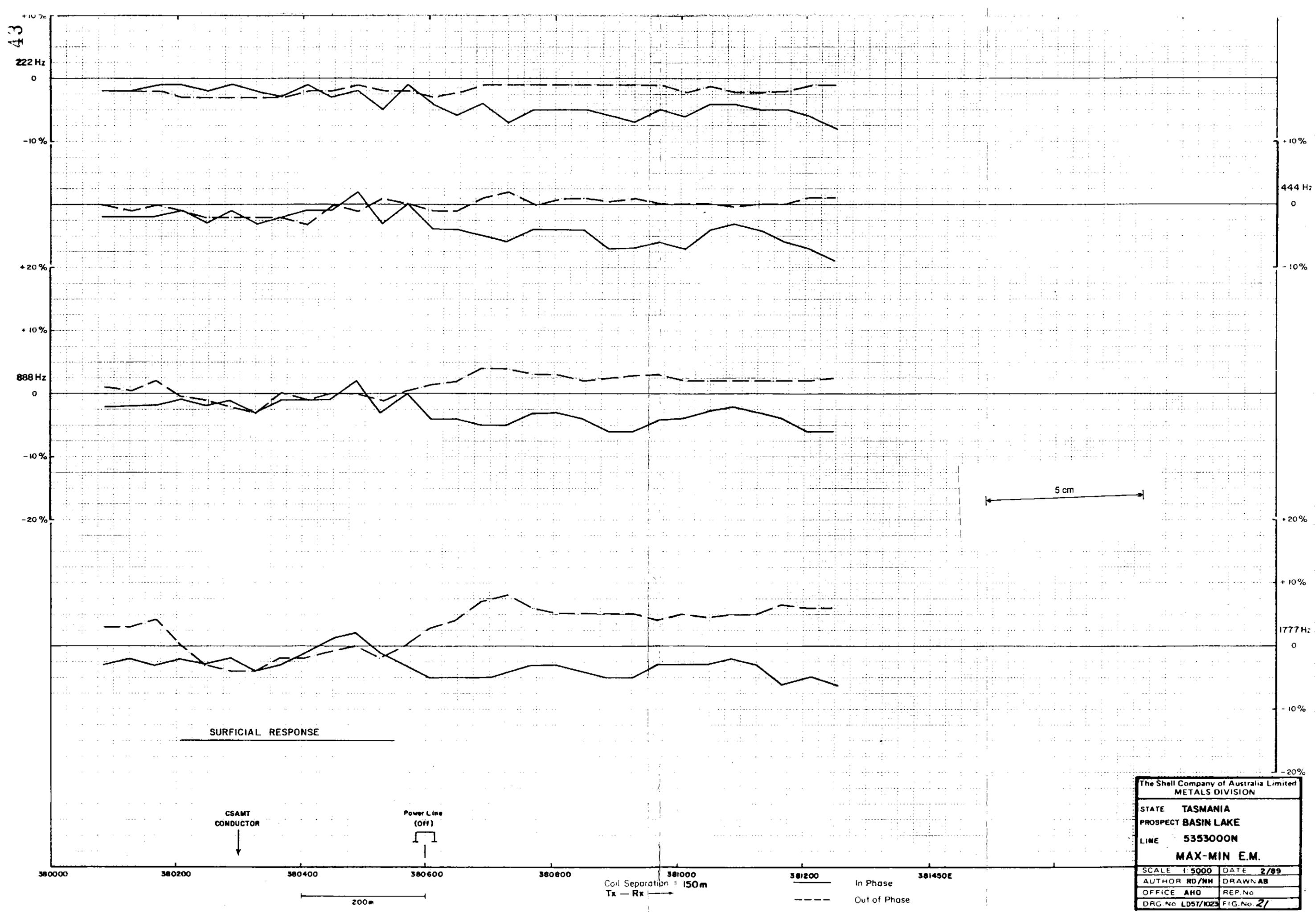
Coil Separation = 150m  
Station Spacing = 20m

200m

— In Phase  
- - - Out of Phase

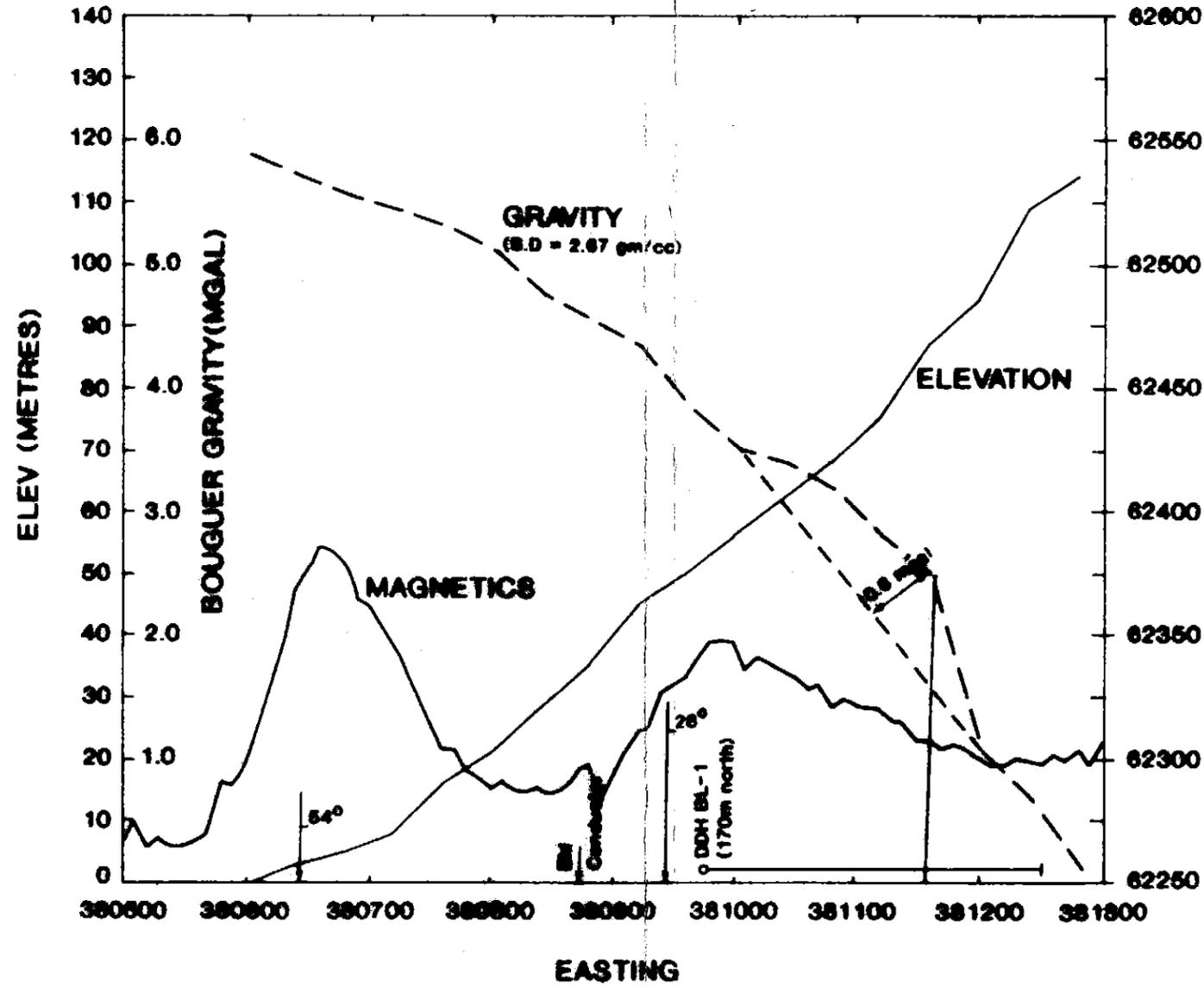
Tx Rx FACING WEST  
TRAVERSE EAST→WEST  
Tx ON FRONT

The Shell Company of Australia Limited METALS DIVISION	
STATE	TASMANIA
PROSPECT	BASIN LAKE
LINE	5352600N MAX-MIN E.M.
SCALE	1:5000
DATE	2/89
AUTHOR	RD/NW
DRAWN	AB
OFFICE	DPT
REP.No.	
DRG No.	FIG No. 20



The Shell Company of Australia Limited METALS DIVISION	
STATE	TASMANIA
PROSPECT	BASIN LAKE
LINE	535300N
<b>MAX-MIN E.M.</b>	
SCALE 1:5000	DATE 2/89
AUTHOR RD/NH	DRAWN AB
OFFICE AHO	REP. No
DRG No LD57/1023	FIG. No 2/

668048

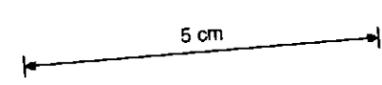


**GRAVITY**

SODIN GRAVITY METER  
 40M STATIONS  
 BASE @ 380 800E / 5 352 000N

**MAGNETICS**

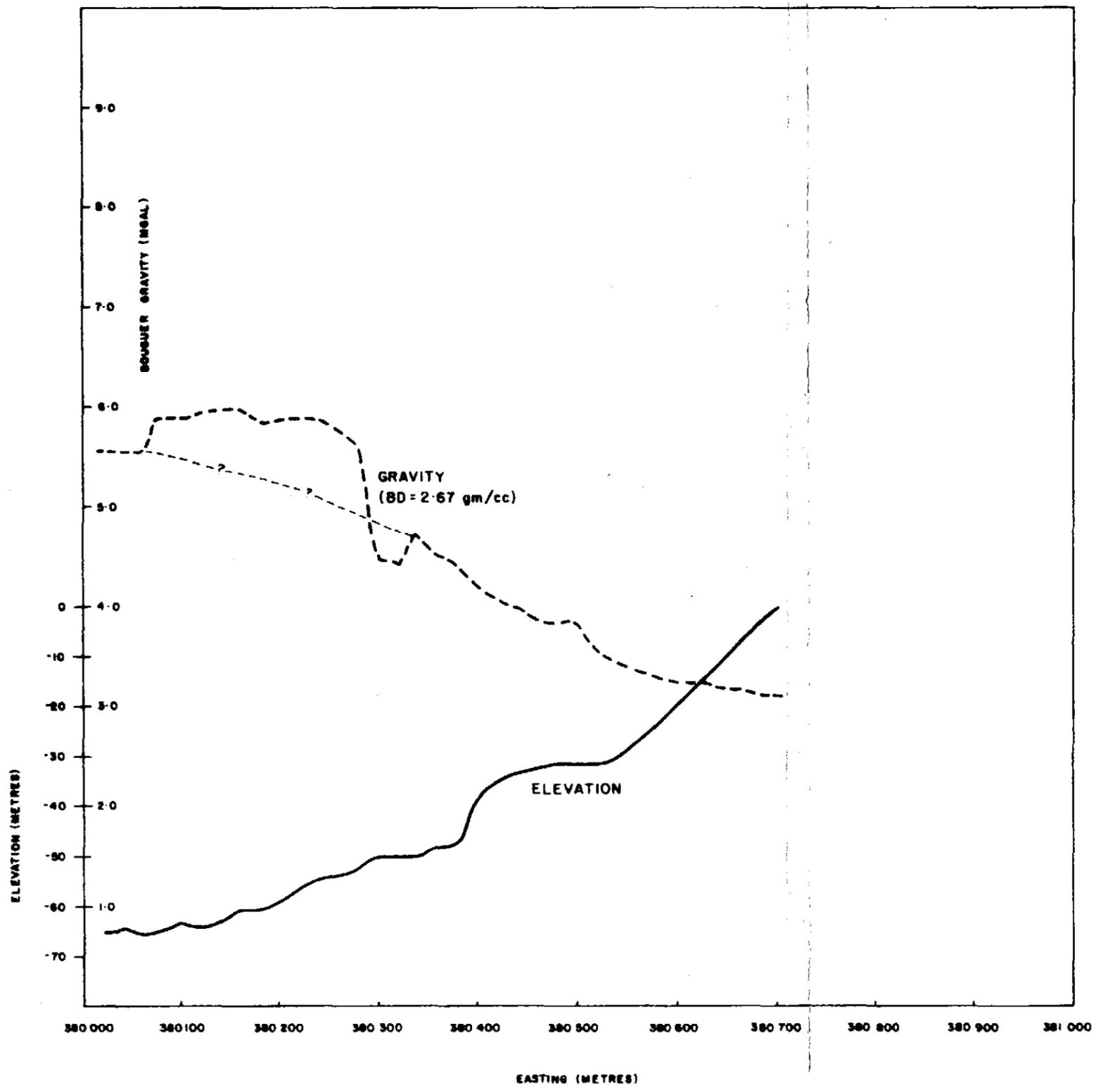
2 X G 858 MAGNETOMETERS  
 10M STATIONS



668049

89-2928

The Shell Company of Australia Limited METALS DIVISION	
STATE	W. TASMANIA
PROJECT	BASIN LAKE
LINE	555800N GRAVITY - MAGNETICS
SCALE	1:5000 DATE 8/89
AUTHOR	BB/BN DRAWN AS
OFFICE	OPT REP.No.
DRG.No.	FIG.No. 22



**GRAVITY**

300m GRAVITY METER  
 40m STATIONS  
 BASE at 380 000 E / 5342 000 N

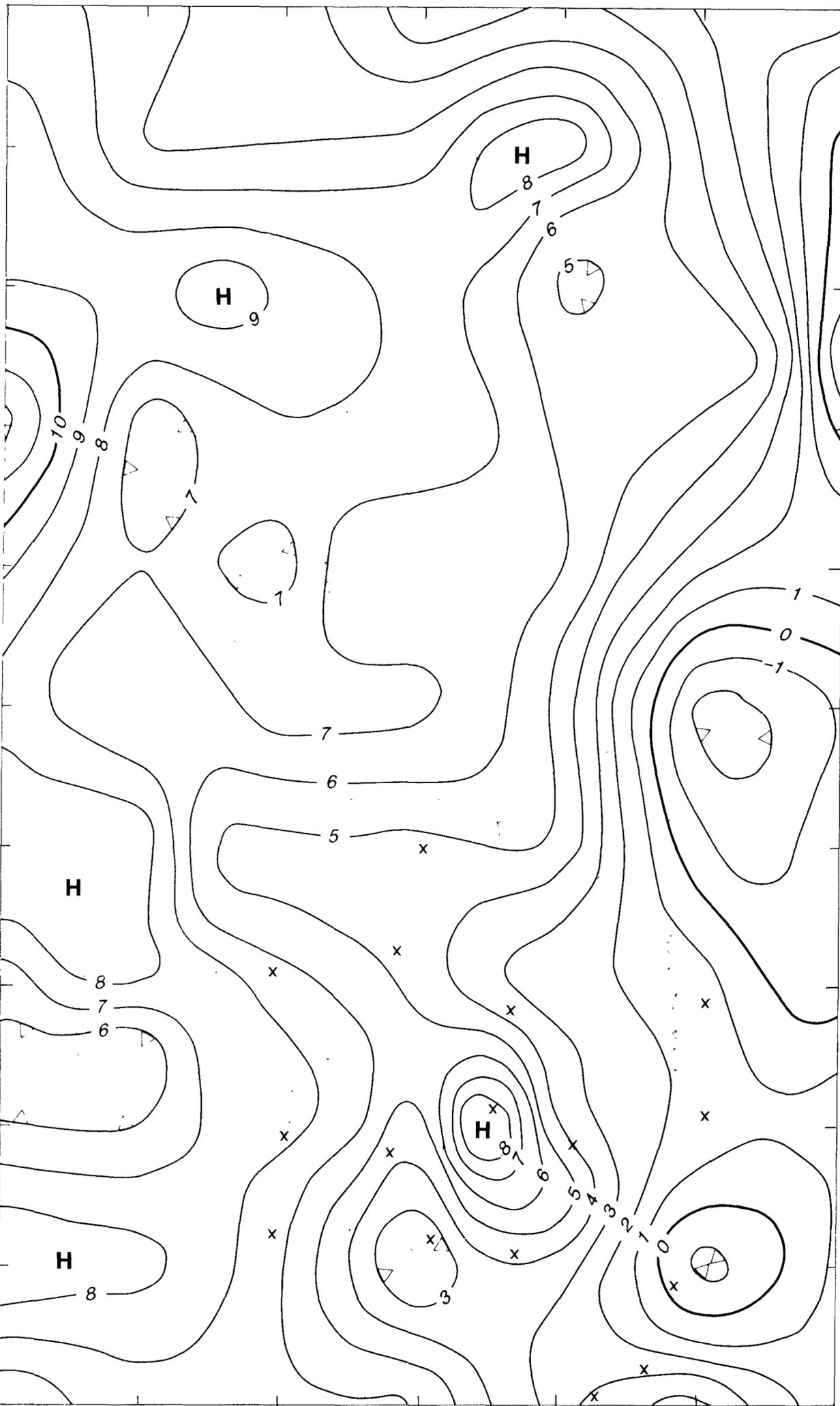
668050

5 cm

89-2928

<b>Billiton Australia Gold Pty Ltd.</b>			
Project		W. TASMANIA BASIN LAKE	
Title			
LINE 5 352 800 mN GRAVITY & MAGNETICS			
Author	R.D./M.H.	Date	3-89
Scale	1:5000		
Drawn	A.M.	Office	AHO
Reviewed			Date
Drawing No.	LD57/1028	Fig. No.	23

5358000N



5348000N 377000E

383000E

From: Department of Mines, Tasmania.

# 89-2928

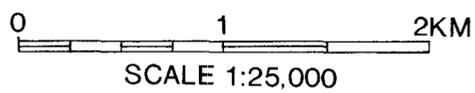
## N.W. TASMANIA

### RESIDUAL BOUGUER GRAVITY BASIN LAKE

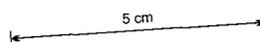
Contour Interval= 1mgal

Author	N HUNGERFORD	Date	SEPT 1988	Encl
Report No		Drawing	LD57/1017	

Fig 24



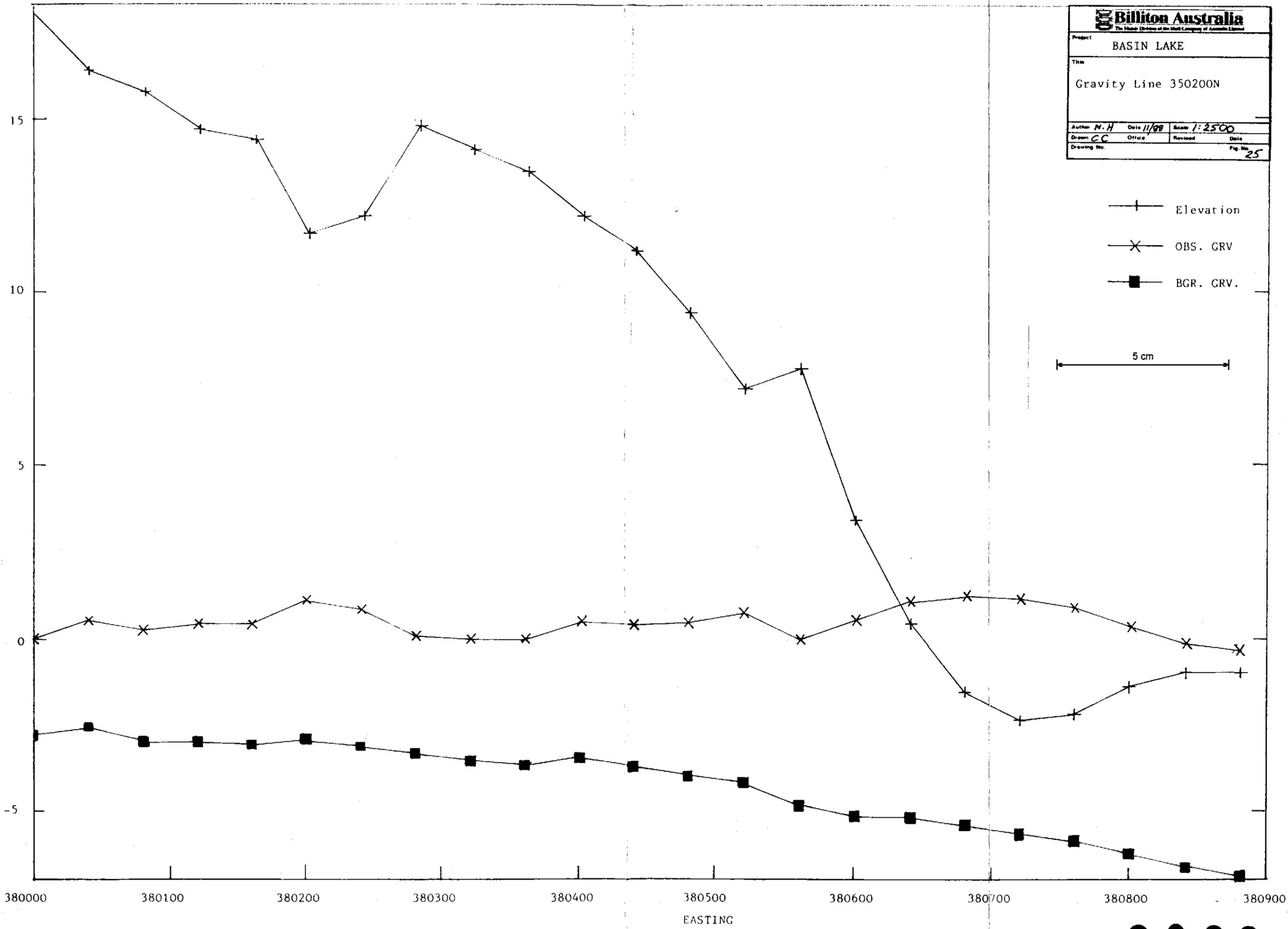
668051



x GRAVITY STATIONS

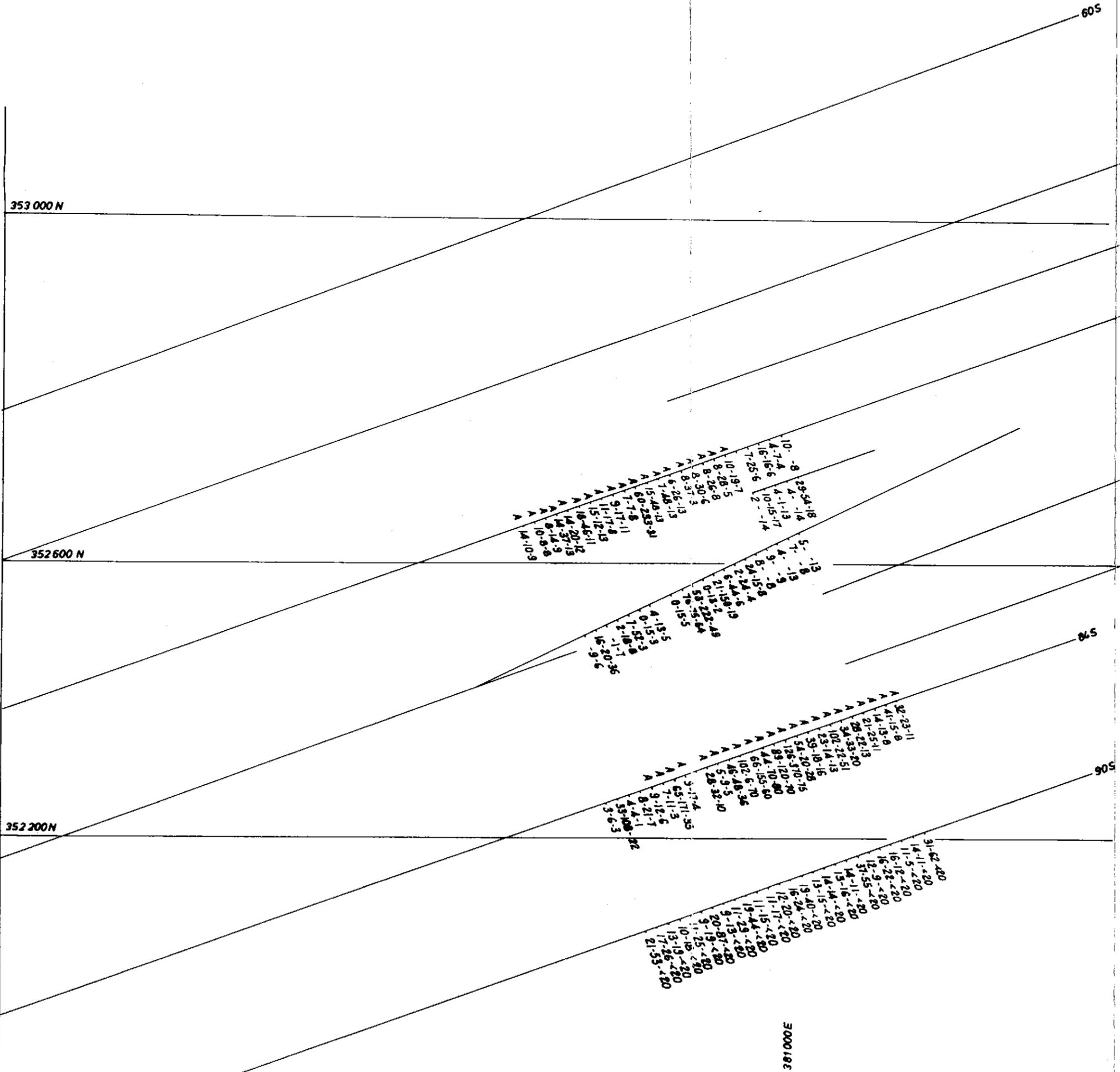
46

Project			
BASIN LAKE			
Title			
Gravity Line 350200N			
Author	N.H	Date	11/88
Scale	1:2500		
Drawn	CC	Office	
Revised		Date	
Drawing No.		Fig. No.	25



668052

89-2928



5 cm

668053  
**89-2928**

-80 Soil sampling  
 A 'A' horizon soil sample  
 Cu - Pb - Zn ppm

0 100 200 300 m

<b>Billiton Australia</b> <small>The Metals Division of the Hall Company of Australia Limited</small>			
Project		E. L. 103/87	
Title			
BASIN LAKE GEOCHEMICAL SOIL SAMPLING COMPILATION 352 000N - 353 000N			
Author	C J C	Date	3/89
Scale	1:5000		
Drawn	OH	Office	TAS
Revised	Date		
Drawing No.	Fig. No. 26		

