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EL 27/76

INDUCED POLARISATION & MAGNETOMETER SURVEY

78-1292

VOYAGER 9

ELLIOTT BAY, TASMANIA

S. T. Mudge

August, 1978.

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CONTENTS

	PAGE NUMBER
INTRODUCTION	1
GEOLOGY	3
MAGNETICS	4
INDUCED POLARISATION	5
CONCLUSION	7
RECOMMENDATIONS	8
APPENDICES	9
REFERENCES	10

ACCOMPANYING DRAWINGS

DRAWING NUMBER	
3724 S/A	Pseudosection of Dipole-dipole IP/ Resistivity, Line 9 500N.
3725 S/A	Pseudosection of Dipole-dipole IP/ Resistivity, Line 10 850N.
3726 S/A	Profiles of Total Magnetic Field Intensity.
3964 S/A	VOYAGER prospects - Location Diagram.

INTRODUCTION

VOYAGER 9 is located in E.L. 27/76 (Elliott Bay) in south-west Tasmania.

The area is held under licence by Geopeko as part of a base metal exploration tenement.

The prospect is on the northern bank of the Lewis River, about 2.5 km north-west of the Lewis River bridge. It is bounded at the south by the river. Its location is shown in Drawing No. 3964 S/A.

The prospect covers a magnetic anomaly, detected by the combined magnetic and electromagnetic helicopter survey flown over the area in 1975 (Geoex - Lewis River area).

The anomaly was located on the ground during March 1978. A 4km baseline, oriented magnetic north-south, was surveyed across the area.

Sufficient time was not available during the 1978 field program to survey a 100m x 100m grid over the anomaly. Consequently, two east-west lines were pegged across the area of the two magnetic highs. The position of these magnetic highs was determined by a magnetometer survey along the baseline and the reconnaissance/location survey.

A dipole-dipole induced polarisation (IP) survey was conducted along these lines in order to test the magnetic source.

The surveys were conducted on the prospect during March 1978 and are the context of this report.

GEOLOGY

The prospect is situated in a sequence of quartz feldspar porphyries with minor intercalations of pyroclastics. These rocks are believed to be the southern portion of the Cambrian Mt. Read volcanics. The strike is north south.

Previous investigations (Lyell-EZ and BHP) have not established the sources of the magnetic anomalies in this area. The VOYAGER 9 prospect is one of several magnetic anomalies situated on the perimeter of the Low Rocky Point granite body. The anomaly's large size and proximity to the granite lead to its investigation with the surveys reported here.

There are large areas of outcrop on the prospect, but it is otherwise covered by several metres of peat and a button grass plain.

A massive sulphide deposit similar to those found elsewhere in the Mt. Read volcanics is the exploration model.

MAGNETICS

Magnetometer surveys were carried out along the three grid lines to locate the grid relative to the two aeromagnetic "highs".

A Geometrics G816 total field proton precession magnetometer was used for the survey. The baseline (10 000E) was surveyed between 8 300N and 12 300N, with readings taken at 25m intervals. Line 9 500N was surveyed between 9 000E and 10 800E and line 10 850N between 8 500E and 11 000E. Readings were taken at 50m intervals.

The magnetic profiles are shown in drawing no. 3726 S/A.

Both lines crossed the area of the magnetic "highs". As a complete survey was not conducted over the anomaly it is not possible to determine whether the lines crossed the centre of the magnetic "highs" or only close to them.

In view of the limited amount of magnetic survey coverage, interpretation and modelling of the results is inappropriate at this stage. It is also not possible at this stage to determine whether the source is one large tabular body enclosing the two magnetic "highs" or two separate bodies.

The survey has provided a guide for the positioning of the IP survey arrays along each line.

INDUCED POLARISATION

A dipole-dipole IP survey was conducted on lines 9 500N and 10 850N. A Huntec 2.5 kw 2 second time domain transmitter was used in conjunction with a Scintrex IPR-8 receiver.

The dipole length was 100m, considered a suitable compromise for the target size and depth extent sought.

Signal-to-noise ratios were generally high.

Results are presented as pseudosections of apparent resistivity, chargeability and metal factor. Chargeabilities are those for the M_{232} portion of the Scintrex IPR-8 decay curve.

Line 10 850N was surveyed with two overlapping arrays, centred at 9 400E and 10 100E. The results are shown in drawing no. 3725 S/A.

A well defined resistivity anomaly was detected between 9 500E and 10 000E. The anomaly indicates a low resistivity source centred at about 9 750E.

The anomaly has associated chargeability and metal factor lows.

Line 9 500N was surveyed with two overlapping arrays centred at 9 400E and 10 100E.

A poorly defined resistivity anomaly was detected between 9 400E and 9 800E. Chargeabilities and metal factors show little character in this zone.

The results of the IP survey indicate that no polarisable source is present. The resistivity survey has detected a wide body with a depth to top of about 100m on line 10 850N.

The poorly defined resistivity anomaly on line 9 500N may indicate that the source is very deep or that the line hasn't crossed over the magnetic source.

CONCLUSION

The magnetometer traverses have located the area of the magnetic "highs". Interpretation of the profiles has not been attempted because of the very limited amount of magnetic data available at present.

Testing with IP has indicated that the magnetic sources are not polarisable. The well developed resistivity anomaly on line 10 800N does indicate the presence of a broad body centred at about 9 750E.

The lack of an IP chargeability anomaly over the magnetic anomaly should not preclude the prospect's mineral potential.

Unless the source of the magnetic anomaly can be explained by surface geology, the prospect will require a detailed magnetic analysis. Recommendations have been made for a complete ground magnetometer survey of the anomaly.

RECOMMENDATIONS

If the geological results indicate that the area is worthy of further work then it is recommended that a 100m x 100m grid be surveyed over the anomaly. East west cross lines should extend at least 1km either side of the present baseline.

A ground magnetometer survey should be conducted to enable interpretation and modelling of the anomaly.

APPENDICES

IP Metal Factors

Metal factors for the IP survey were calculated using:-

$$MF = \frac{M_{232}}{\rho a} \times t \times 2000 \left[\Omega^{-1} \; m^{-1}\right]$$

where

M_{232} = M_{232} portion of the Scintrex IPR-8 decay curve $\left[mVV^{-1}\right]$

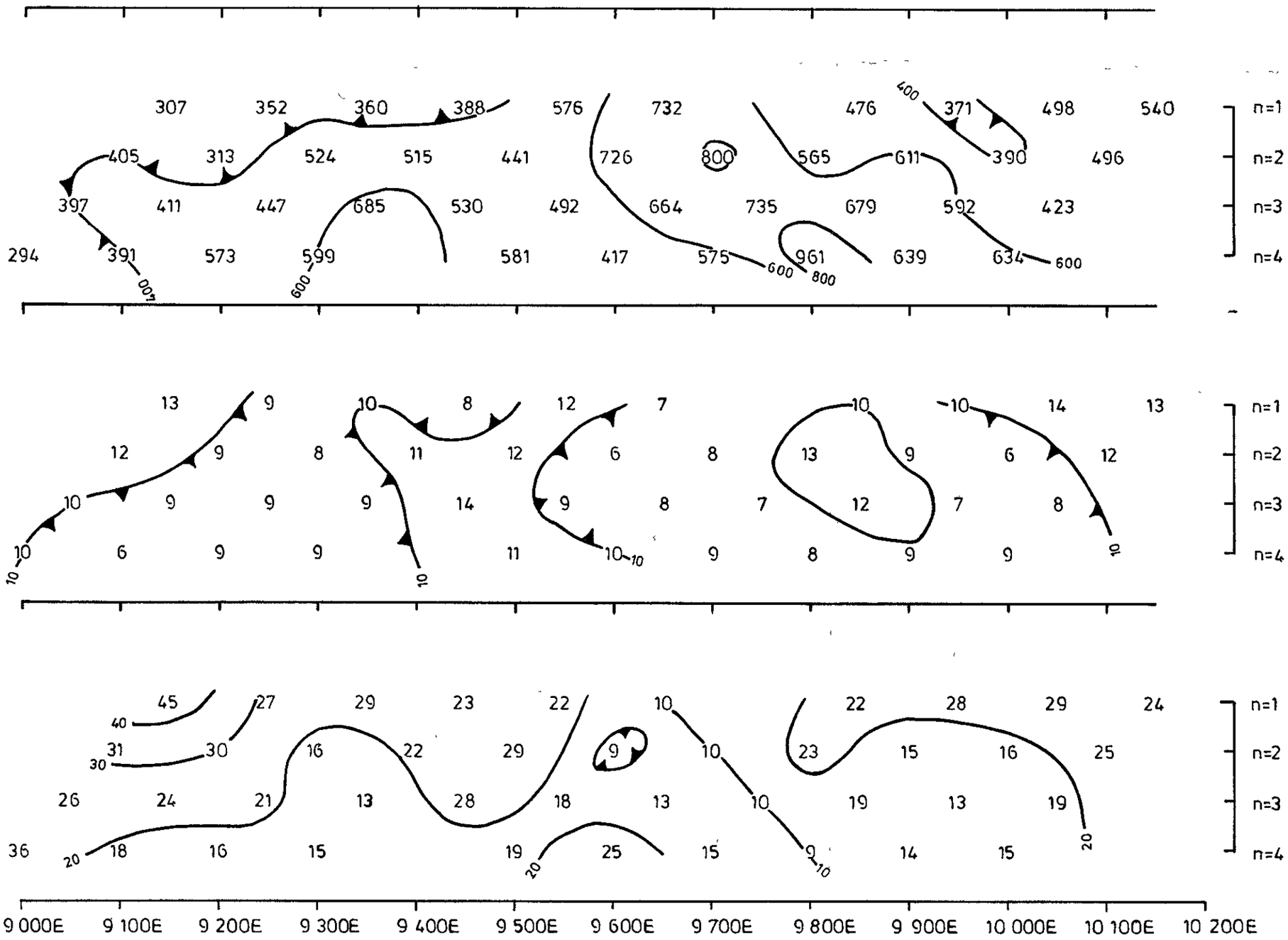
ρa = apparent resistivity $\left[\Omega\, m\right]$

t = integration period for the Scintrex IPR-8 M_{232} component, 520ms.

2000 is a scaling factor to obtain the units $\Omega^{-1} m^{-1}$.

REFERENCES

GEOEX PTY. LTD. 1975: Report on Helicopter magnetic and Electromagnetic Survey in the Lewis River Area, Tasmania (for BHP Company Ltd.)



APPARENT RESISTIVITY (ρa)
CONTOUR INTERVAL=200 Ωm

APPARENT CHARGEABILITY (M_{232})
CONTOUR INTERVAL=5mV V^{-1}

METAL FACTORS (M_{232})
CONTOUR INTERVAL=10 $\Omega^{-1}m^{-1}$

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5 cm

Note:- Dipole length = 100 m

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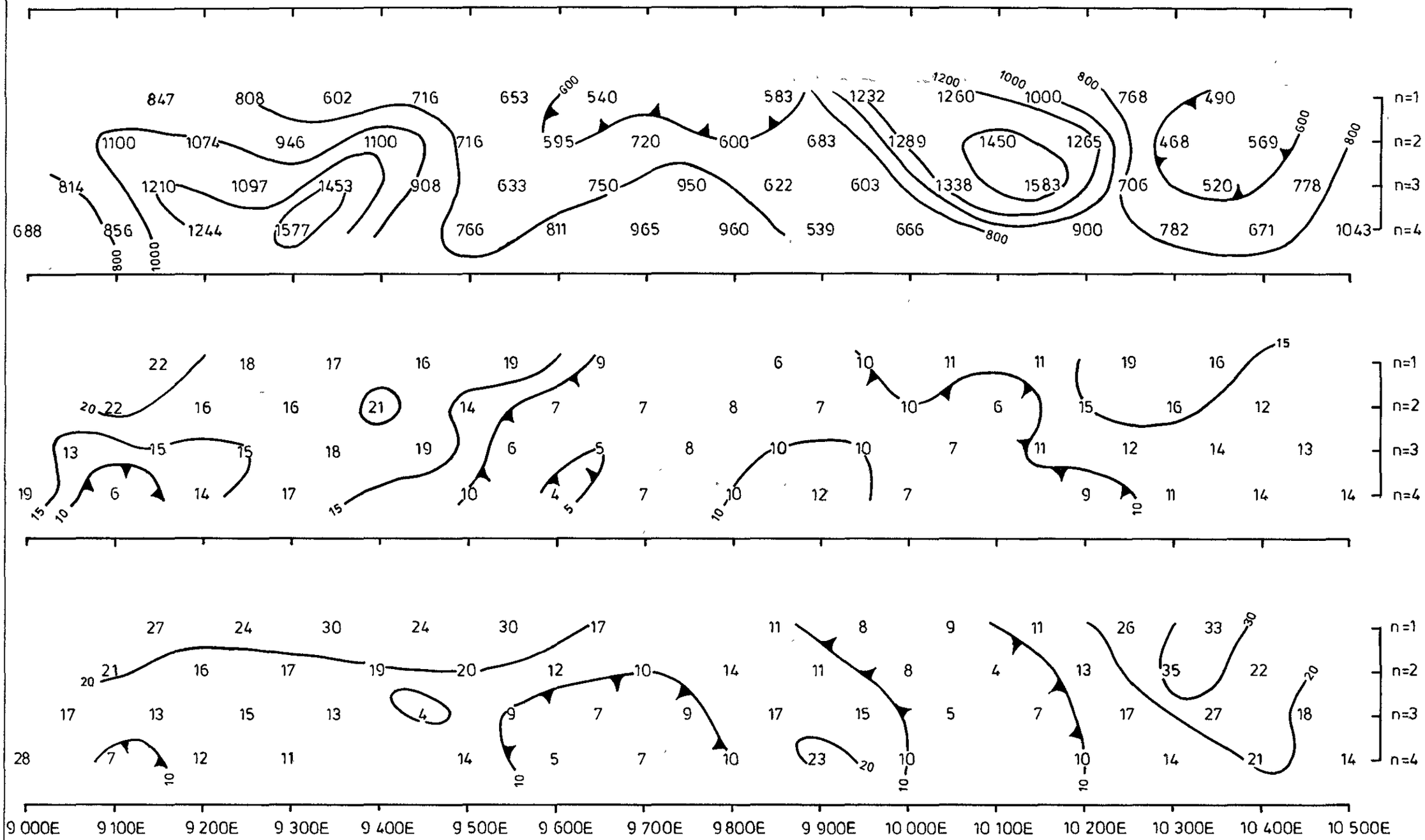
GEOPEKO LTD. Geophysical Surveys	Instrument IPR-8	Datum	Hor Scale 1:5000	AREA	Elliott Bay-Tasmania
Plan No 3724 S/A . 013	Observer S.Mudge P Muir	Base Peg	Vert Scale	PROSPECT	VOYAGER 9 - LINE 9 500N
	Scale Fact	Date March 1978	Cont Int	PLAN SHOWS	Pseudosection of Dipole-Dipole IP/Resistivity



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Note:- Dipole length=100m

5 cm

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GEOPEKO LTD. Geophysical Surveys	Instrument IPR-8	Datum		Hor Scale	1:5 000	AREA	Elliott Bay - Tasmania
	Observer S Mudge P.Muir	Base Peg		Vert Scale		PROSPECT	VOYAGER 9 - LINE 10 850N
Plan No 3725 S/A 014	Scale Fact	Date	March 1978	Cont Int		PLAN SHOWS	Pseudosection of Dipole-Dipole IP/Resistivity

BASELINE 10 000E

64 800
700
600
500
400
300
200
100
64 000
900
800
700
600
500
400
300
200
100
63 000
900
62 800
nT

LINE 10 850N

8 500E 8 600E 8 700E 8 800E 8 900E 9 000E 9 100E 9 200E 9 300E 9 400E 9 500E 9 600E 9 700E 9 800E 9 900E 10 000E 10 100E 10 200E 10 300E 10 400E 10 500E 10 600E 10 700E 10 800E 10 900E 11 000E

64 800
700
600
500
400
300
200
100
64 000
900
800
700
600
500
400
300
200
100
63 000
900
62 800
nT

LINE 9 500N

8 500E 8 600E 8 700E 8 800E 8 900E 9 000E 9 100E 9 200E 9 300E 9 400E 9 500E 9 600E 9 700E 9 800E 9 900E 10 000E 10 100E 10 200E 10 300E 10 400E 10 500E 10 600E 10 700E 10 800E 10 900E 11 000

11 000E 10 900E 10 800E 10 700E 10 600E 10 500E 10 400E 10 300E 10 200E 10 100E 10 000E 9 900E 9 800E 9 700E 9 600E 9 500E 9 400E 9 300E 9 200E 9 100E 9 000E 8 900E 8 800E 8 700E 8 600E 8 500E

12 300N 12 200N 12 100N 12 000N 11 900N 11 800N 11 700N 11 600N 11 500N 11 400N 11 300N 11 200N 11 100N 11 000N 10 900N 10 800N 10 700N 10 600N 10 500N 10 400N 10 300N 10 200N 10 100N 10 000N 9 900N 9 800N 9 700N 9 600N 9 500N 9 400N 9 300N 9 200N 9 100N 9 000N 8 900N 8 800N 8 700N 8 600N 8 500N 8 400N 8 300N

64 800 700 600 500 400 300 200 100 64 000 900 800 700 600 500 400 300 200 100 63 000 900 62 800
nT

5 cm

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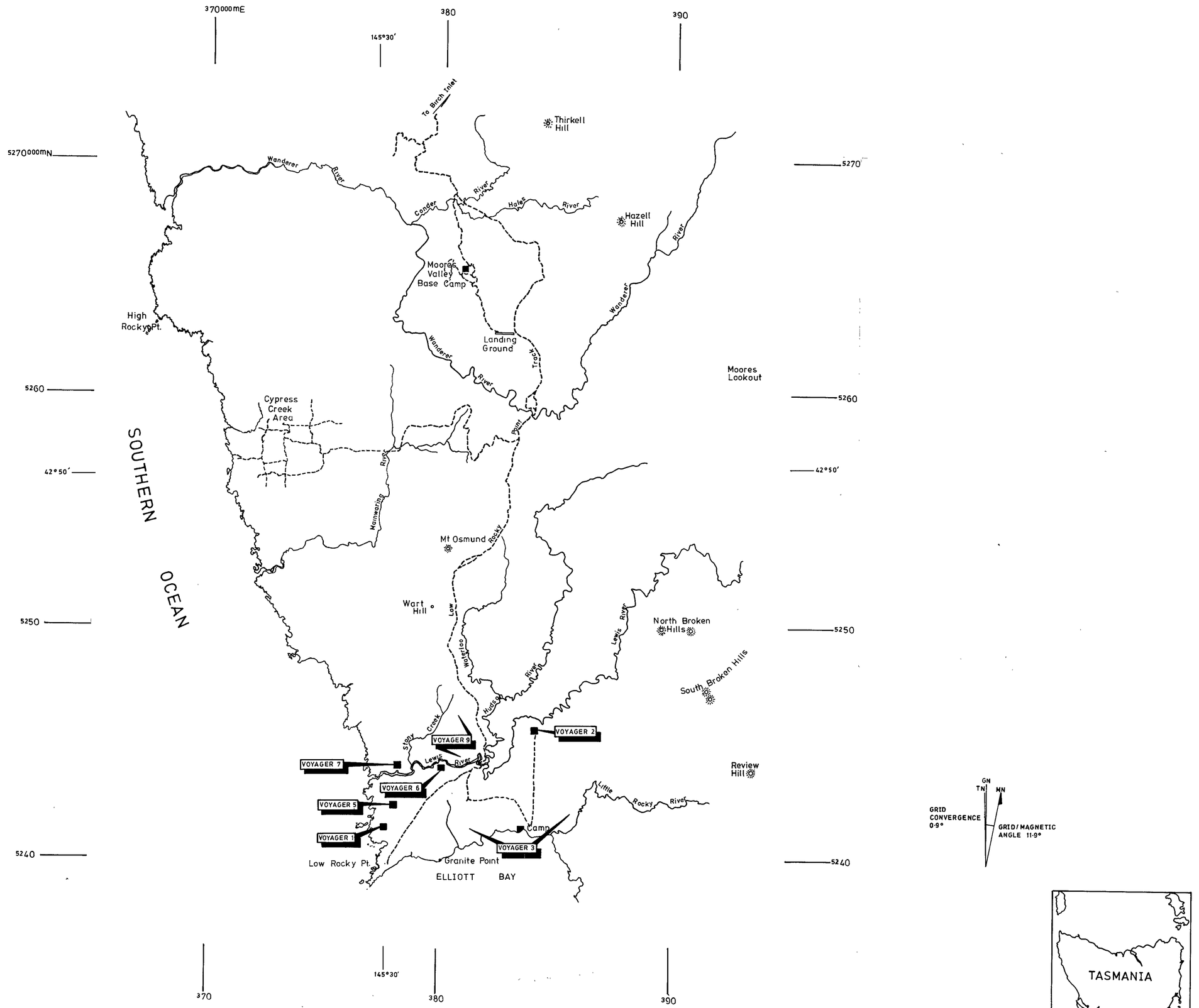
GEOPEKO LTD		Instrument	G 816	Datum	G2800nT	Hor Scale	1:5 000	AREA	Elliott Bay-Tasmania 015
Geophysical Surveys		Observer	S.Mudge, P.Muir	Base Peg		Vert Scale	1cm=100nT	PROSPECT	VOYAGER 9
Plan No. 3726 S/A		Scale Factor		Date	March 1978	Cont Int		PLAN SHOWS	Profiles of Total Magnetic Field Intensity



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GEOPEKO LTD Geophysical Surveys Plan No. 3964 S/A		Instrument		Datum		Hor Scale	1:100 000	AREA	Elliott Bay - Tasmania 016
		Observer	S. Mudge	Base Peg		Vert Scale		PROSPECT	VOYAGER PROSPECTS
		Scale Factor		Date	September 1978	Cont Int		PLAN SHOWS	Location Diagram