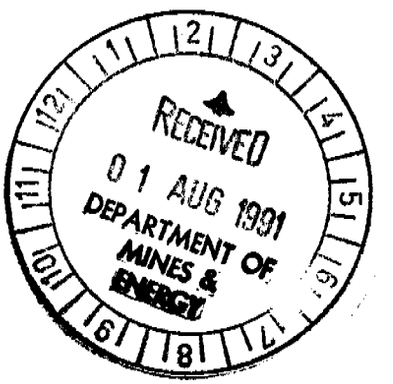
ANNUAL REPORT

EXPLORATION LICENCE No.6853

21 June 1990 - 20 June 1991

1:250000 - PINE CREEK (SD52-08)
1:100000 - DALY RIVER (5070)

Compiled: R J Love
July 1991



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APPENDICES

1. INTRODUCTION

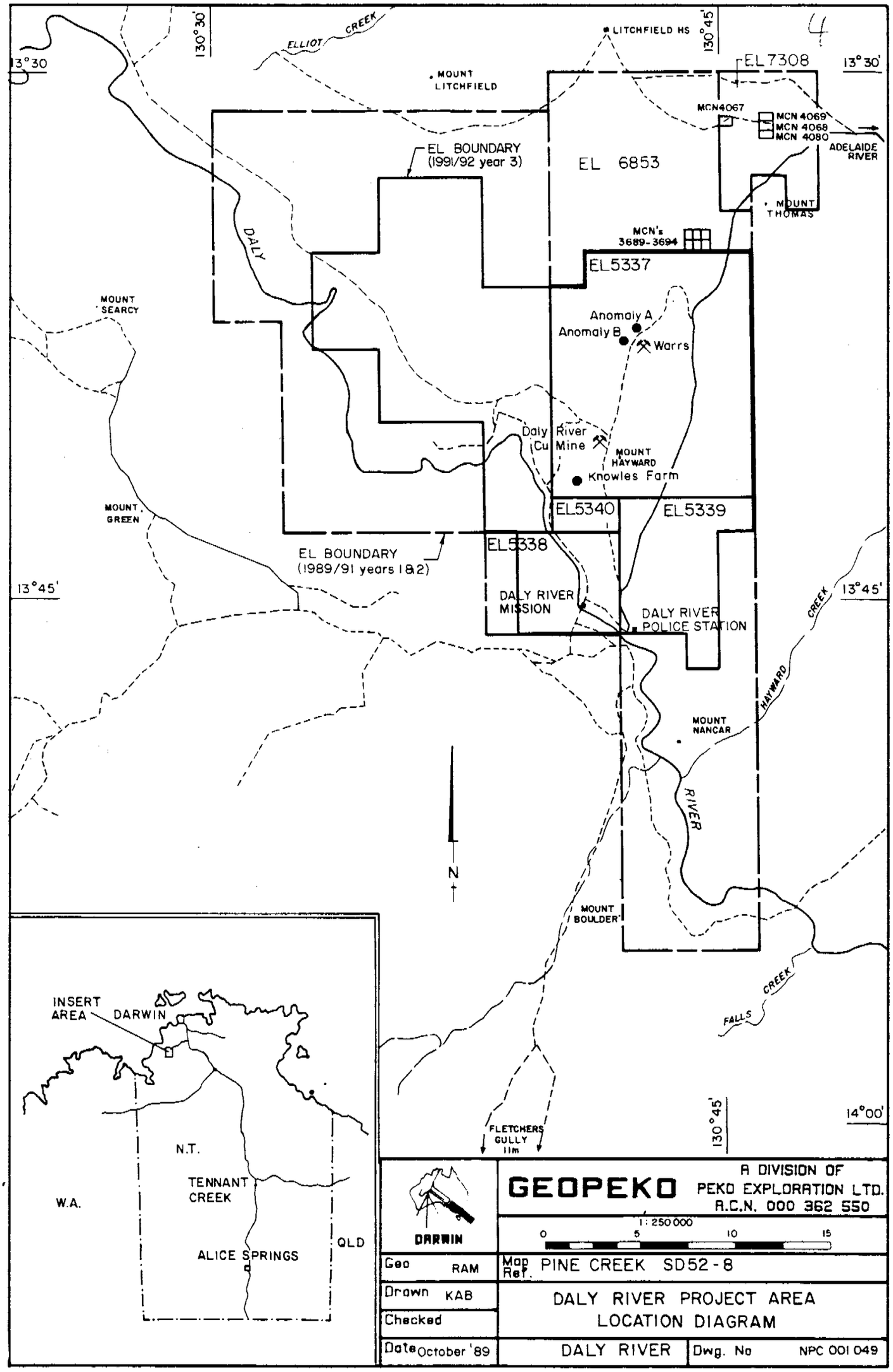
This report covers exploration activities undertaken by Geopeko (A Division of Peko Exploration Ltd) within Exploration Licence No 6853 during the first year of tenure, from 21-6-90 to 20-6-91.

The licence area covers a total of 27 graticular blocks (87 sq.km), located approximately 120 km south southwest of Darwin in the Daly River region of the Northern Territory (Diagram NPC 001 049).

Access to the area may be gained via well formed dirt tracks leading from the Daly River Road.

Exploration during the first year of tenure has been directed at compiling regional geophysical data which would be capable of identifying targets similar to those found to be associated with Cu, Pb, Zn and Au mineralisation known elsewhere in the field to be contained within rocks of the mid proterozoic Finnis River Group. Work included image processing of recent government airborne geophysical data and selected coverage of the area with airborne EM.

Two areas have been selected for more detailed evaluation, in the form of ground magnetic and geochemical traverses leading to RC drilling, and this work constitutes the basis of the proposed exploration program for the second licence year.


13°30'
130°30'
ELLIOT CREEK
LITCHFIELD HS
130°45'
EL 7308
13°30'
MOUNT LITCHFIELD
MCN4067
MCN 4069
MCN 4068
MCN 4080
ADELAIDE RIVER
EL BOUNDARY (1991/92 year 3)
EL 6853
MOUNT THOMAS
DALY
MCN's 3689-3694
EL5337
MOUNT SEARCY
Anomaly A
Anomaly B
Warrs
Daly River Cu Mine
MOUNT HAYWARD
Knowles Farm
EL5340
EL5339
MOUNT GREEN
EL5338
EL BOUNDARY (1989/91 years 1&2)
13°45'
DALY RIVER MISSION
DALY RIVER POLICE STATION
HAYWARD CREEK
13°45'
MOUNT NANCAR
RIVER
N
MOUNT BOULDER
CREEK
FALLS
FLETCHERS GULLY 11m
130°45'
14°00'
INSERT AREA
DARWIN
N.T.
TENNANT CREEK
W.A.
QLD
ALICE SPRINGS
DARWIN
GEOPEKO
A DIVISION OF PEKO EXPLORATION LTD.
R.C.N. 000 362 550
1:250 000
0 5 10 15
Geo RAM
Map Ref. PINE CREEK SD52-8
Drawn KAB
Checked
DALY RIVER PROJECT AREA
LOCATION DIAGRAM
Date October '89
DALY RIVER
Dwg. No NPC 001 049

2. PREVIOUS EXPLORATION

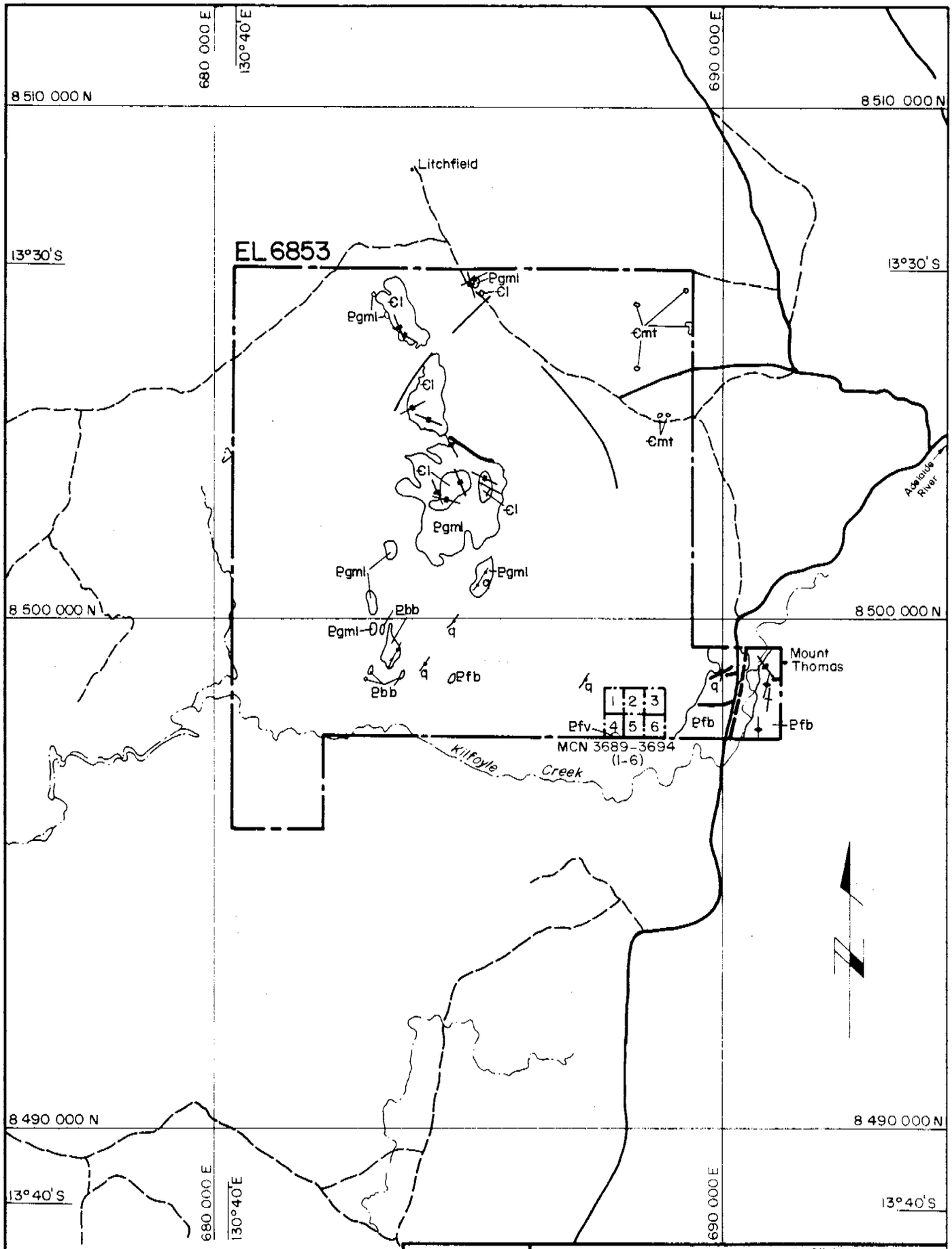
Exploration in the area now contained within EL 6853 has previously been undertaken by Keewanee Australia Pty Ltd (1970 - 1973), BHP (1974 - 1975), Suttons Motors/Mobil Energy Minerals Australia JV (1977 - 1982), and Territory Resources. Work included photogeology, ground radiometric and magnetic surveys, rotary percussion drilling and diamond drilling.

Interest during the latter portion of this time was directed at evaluating the source of a radiometric anomaly located toward the southeast corner of the licence area and known as the Kilfoyle Creek Prospect. Exploration activities failed to identify the cause of this anomalism and it was speculated that the source was located further to the south in ground which is now part of EL 5337.

3. REGIONAL GEOLOGY

The licence area lies within the Litchfield block on the western edge of the Pine Creek Geosyncline and contains lower proterozoic fine grained sediments and volcanics of the Finnis River Group. These sediments have been intruded by the Litchfield Granite and later overlain by mid cambrian sediments and carbonates of the Daly River Group (see diagram NPC 001 179).

Exploration has been directed at the potential for base metal mineralisation contained within volcanic members which are located within the lower portion of the Burrell Creek Formation. Interpretation of geophysical data collected within ground to the south of EL 6853 suggests that extensions to the Warrs Volcanic Member, known to host Zn, Pb, Cu and Ag deposits, may extend into the EL.


680 000 E
130°40'E
690 000 E
8 510 000 N
Litchfield
13°30'S
EL 6853
Pgml
€l
€mt
Adelaide River
8 500 000 N
Pbb
q
Pfb
Mount Thomas
1
2
3
4
5
6
Pfv
MCN 3689-3694
(1-6)
Killoyle Creek
8 490 000 N
13°40'S
LEGEND
€mt Tindall Limestone
€l Quartz Arenite
Pgml Mt Litchfield granite
Pfb Burrell Ck formation
Pfv Warrs volcanic member
q Quartz
Fault
Lineament
Vertical joint
Vertical strata
Vertical foliation
Strike & dip
DARWIN
GEOPEKO
A DIVISION OF
PEKO EXPLORATION LTD.
A.C.N. 000 362 550
Scale 1:100 000
200 0 200 400 metres
Geo
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Drawn K S.J.
Checked
Date JULY'91
EL 6853
REGIONAL GEOLOGY
DALY RIVER
Dwg. No NPC 001 179

4. WORK DURING FIRST LICENCE YEAR

4.1 REGIONAL GEOPHYSICS

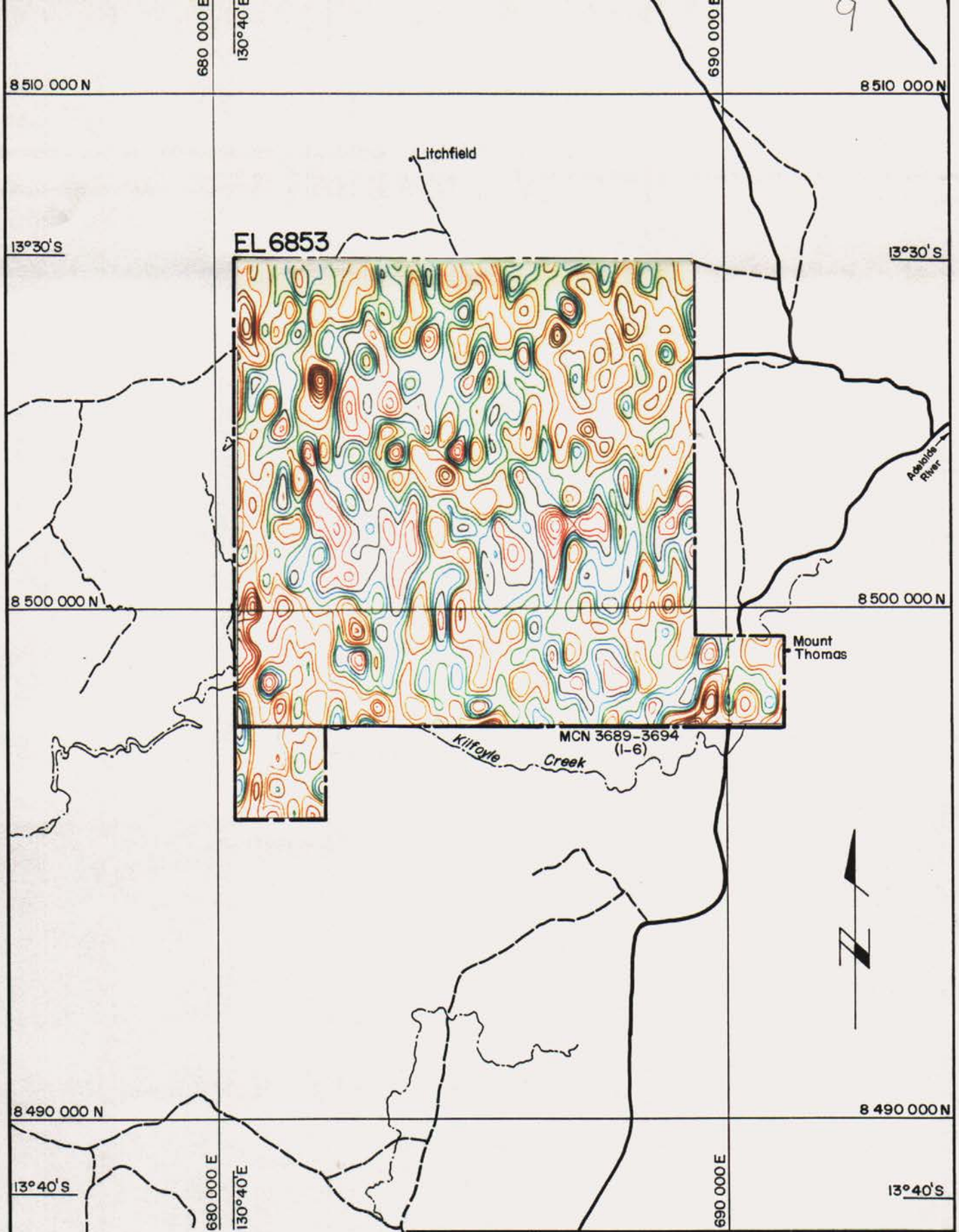
Digital data from an airborne geophysical survey conducted over the Daly River region, commissioned by the NT Geological Survey and undertaken by Aerodata in 1984, was acquired in order to evaluate the geophysical characteristics of the area.

Flight lines were flown at a spacing of 500m with a terrain clearance of approximately 100m. The digital data was image processed on a Sun Sparcstation 1 and viewed as shadow images and colour contours (see NPC 001 179a-d).

The regional magnetics is dominated by a 3-4 km wide zone of magnetic material which incorporates fine grained sediments of the Burrell Creek Formation and rhyolites and volcaniclastic material of the Warrs and Mulluk Mulluk Volcanic Members. This NNE - SSW trending zone extends from an area well to the south of the Daly River to a point near the southern boundary of EL 6853 where it appears to be displaced to the west by aproximately 5km. While there is insufficient exposure in the area to support the presence of sinistral faulting, a 1680nT amplitude magnetic anomaly located at 688350E/8497850N (AMG) and termed the DR403 prospect may represent the northernmost extension of the Warrs Volcanic Member prior to its termination by the Litchfield Granite.

A second magnetic anomaly, known as DR417 and located along the eastern boundary of the licence area at 689650E/8504500N (AMG), was selected for more detailed ground follow-up in view of its similarity to anomalies situated within EL 5337 and which are associated with pyrrhotite.

The radiometric channels did not present any information which had not already been pursued by previous exploration, particularly that by Mobil Energy Minerals Australia, who sought stratabound uranium deposits similar to those found in the Alligator Rivers region. The conclusion of this work was that the granite had more potential for associated tin/tungsten mineralisation than for uranium.



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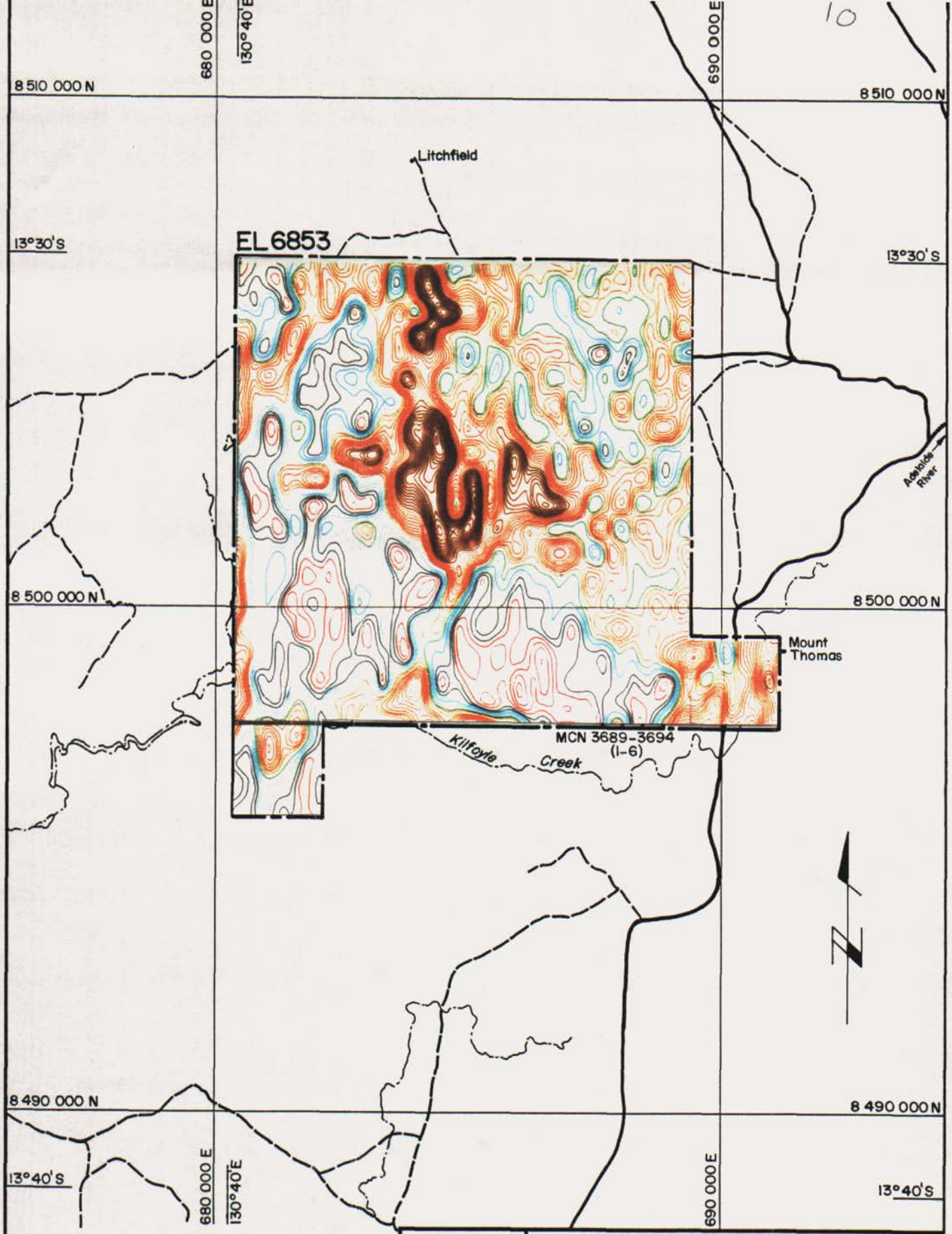
Date JULY'91	DALY RIVER	Dwg. No NPC 001 179/a



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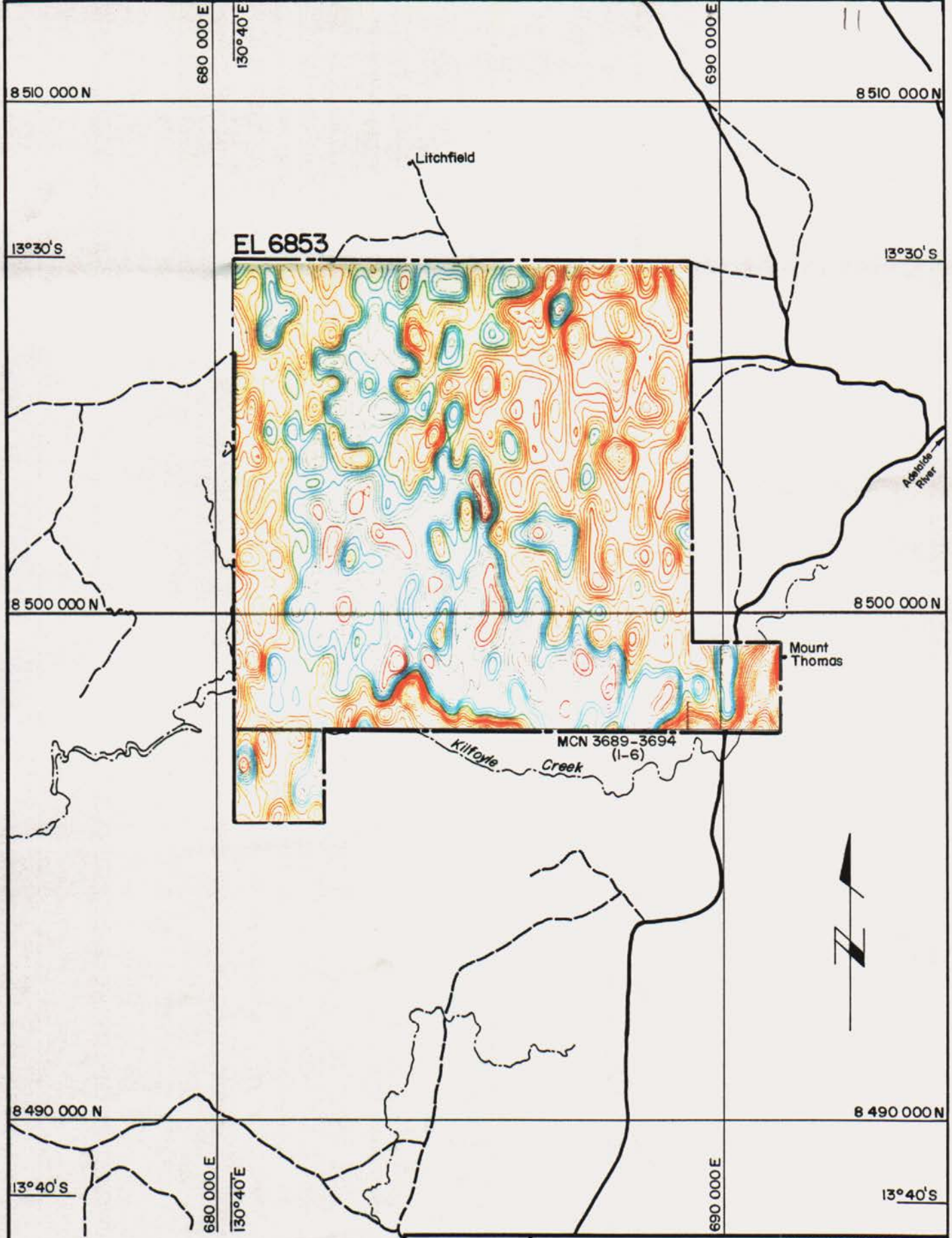

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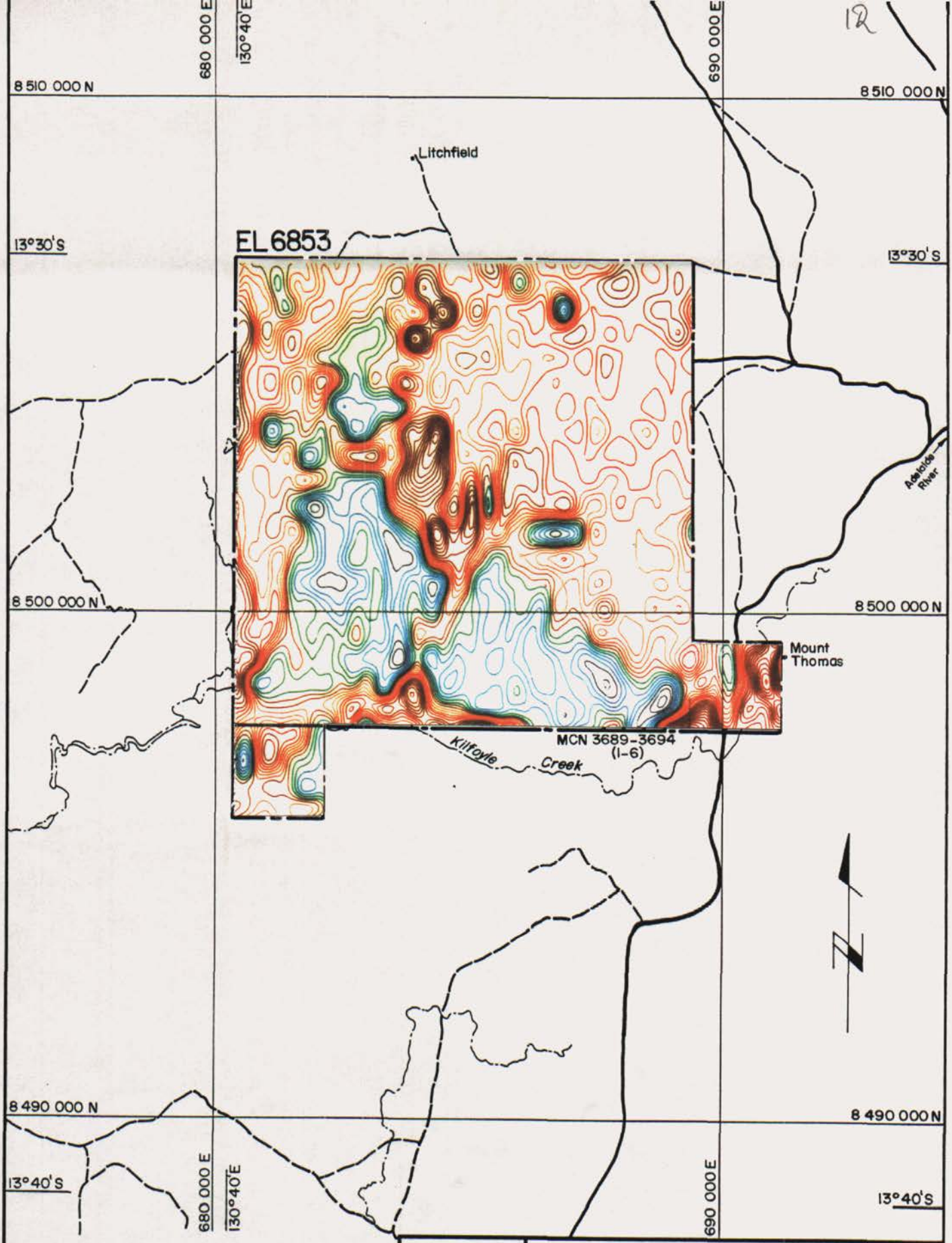
Date JULY'91	DALY RIVER	Dwg. No NPC 001 179/c



DARWIN

GEOPEKO A DIVISION OF PEKO EXPLORATION LTD. A.C.N. 000 362 550

Scale 1:100 000

200 0 200 400 metres

Geo	Map Ref. DALY RIVER 5070
Drawn K.S.J.	EL 6853 TOTAL COUNT
Checked	
Date JULY'91	DALY RIVER — Dwg. No NPC 001 179/d

4.2 AIRBORNE EM SURVEY

Trial surface EM surveys in the vicinity of the Anomaly A Zn/Pb deposit, located in ground immediately to the south of EL 6853, indicated the the cover in this area exhibited sufficient resistivity to resolve deep seated conductors which may in some cases represent bodies of massive sulphide. As a result, an extensive airborne EM survey was undertaken which was designed to incorporate the southern portion of EL 6853 and a section in the vicinity of the DR417 prospect.

Approximately 66 line km of GEOTEM was flown by Geoterrex within EL 6853 during June 1990, the results of which are included in Appendix 1. Evaluation of this data by S Jagger and R Lockwood, of Geoterrex Pty Ltd, resulted in the definition of four anomalous areas (DR3 - DR6), however none of these anomalies were sufficiently encouraging to warrant immediate field folow-up.

4.3 EXPENDITURE

Expenditure on exploration within EL 6853 to 30 June 1991, being the closest statement period for which Geopeko have collated costs, is $23582, the breakdown of which is as follows:

Category	Expenditure($)
Salaries - Geologists	1783
Geophysicists	2700
Technicians	1821
Tenement Expenses	270
Vehicles	3053
Travel and Accommodation	1289
Freight and Supplies	1022
Communications	640
Publications and Maps	491
Airborne EM Survey	5855
Geophysical Instrument Hire	26
Base Support Costs	2741
Management Charge	1891
Total	$23582

The corresponding covenant for the first year of exploration was $35000, therefore resulting in a shortfall in actual expenditure of $11418.

This shortfall comes as the result of a variation to the proposed work program which included a substantial component relating to regional stream sediment and rock chip sampling. Early field reconnaissance of the area indicated that this type of exploration would not be effective in the terrain contained within the EL and as a consequence more emphasis was placed on regional evaluation through airborne geophysical data.

Geopeko therefore seeks a variation to the covenant to apply to the expenditure for the first tenure year.

5. CONCLUSIONS

(a) Two significant magnetic anomalies are present within the EL area which show characteristics similar to those found to be associated with mineralisation contained within the Anomaly A lode system, located to the south of EL 6853, where pyrrhotite, sphalerite and galena are found within a fine grained tuffaceous unit known as the Warrs Volcanic Member.

(b) Evaluation of regional magnetics suggests that the Warrs Volcanic Member extends into EL 6853.

(c) Airborne EM is an effective regional exploration tool in the licence area and has successfully delineated several near surface conductors.

6. RECOMMENDATIONS

(a) Conduct detailed ground magnetic surveys to assist with target definition in the DR403 and DR417 prospect areas.

(b) Undertake vacuum/aircore drill traverses across the DR403 and DR417 prospects for information on bedrock geochemistry.

(c) Undertake RC or diamond drilling on those targets which appear to be related to concealed bodies of base metal sulphides.

7. PROPOSALS FOR SECOND LICENCE YEAR

7.1 PROPOSED EXPLORATION PROGRAM

The proposed exploration work program for the period 21/6/91 to 20/6/92 is as follows:

(a) complete geochemical sampling of bedrock material through shallow aircore/vacuum drilling of magnetic and radiometric anomalies (approximately 100 holes)

(b) undertake more detailed ground magnetic traverses in the DR403 and DR417 prospect areas

(c) assess geophysical and geochemical data for drill targets and complete RC or diamond holes were necessary (approximately 400m)

7.2 PROPOSED BUDGET - 2ND YEAR

In order to complete the program outlined above a budget of $31000 would be made available, the breakdown of which is as follows:

Category	**Expenditure ($)**
Salaries and Wages	7000
Vehicles	2000
Field Supplies	1000
Travel and Accommodation	2000
Drilling - Vacuum	2000
- Reverse Circulation	10000
Analytical Costs	2000
Base Support Costs	3000
Administration	2000
TOTAL	$31000

APPENDIX 1

AIRBORNE EM SURVEY DATA

(a) Geoterrex Report
(b) EM Profiles Lines 152-157, 201-205
(c) Flight Line Diagram
(1:25000 map sheet 5070-IV-NE)

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LOGISTICS AND INTERPRETATION REPORT

AIRBORNE ELECTROMAGNETIC SURVEY

DALY RIVER, NT

FOR

GEOPEKO LIMITED

JOB NO. 2-631

SEPTEMBER 1990

Sue Jaggar
Ray Lockwood
GEOTERREX PTY. LTD.
13 WHITING STREET,
ARTARMON NSW 2064

SECTION 1 - GEOTEM LOGISTICS REPORT

INTRODUCTION

From the 9th to 11th June 1990, Geoterrex Pty Ltd conducted an airborne electromagnetic survey in the Daly River Region in the Northern Territory for Geopeko Ltd. This report summarises the logistics, survey parameters, calibration procedures and processing details of the survey.

In all, 496 kilometres of GEOTEM electromagnetic data was collected in 2 flights over the survey area (Figure 1) at a base operating frequency of 125 Hz. A line spacing of 250 metres with a flight line orientation of East/West was used.

The base of operations was Katherine in the Northern Territory.

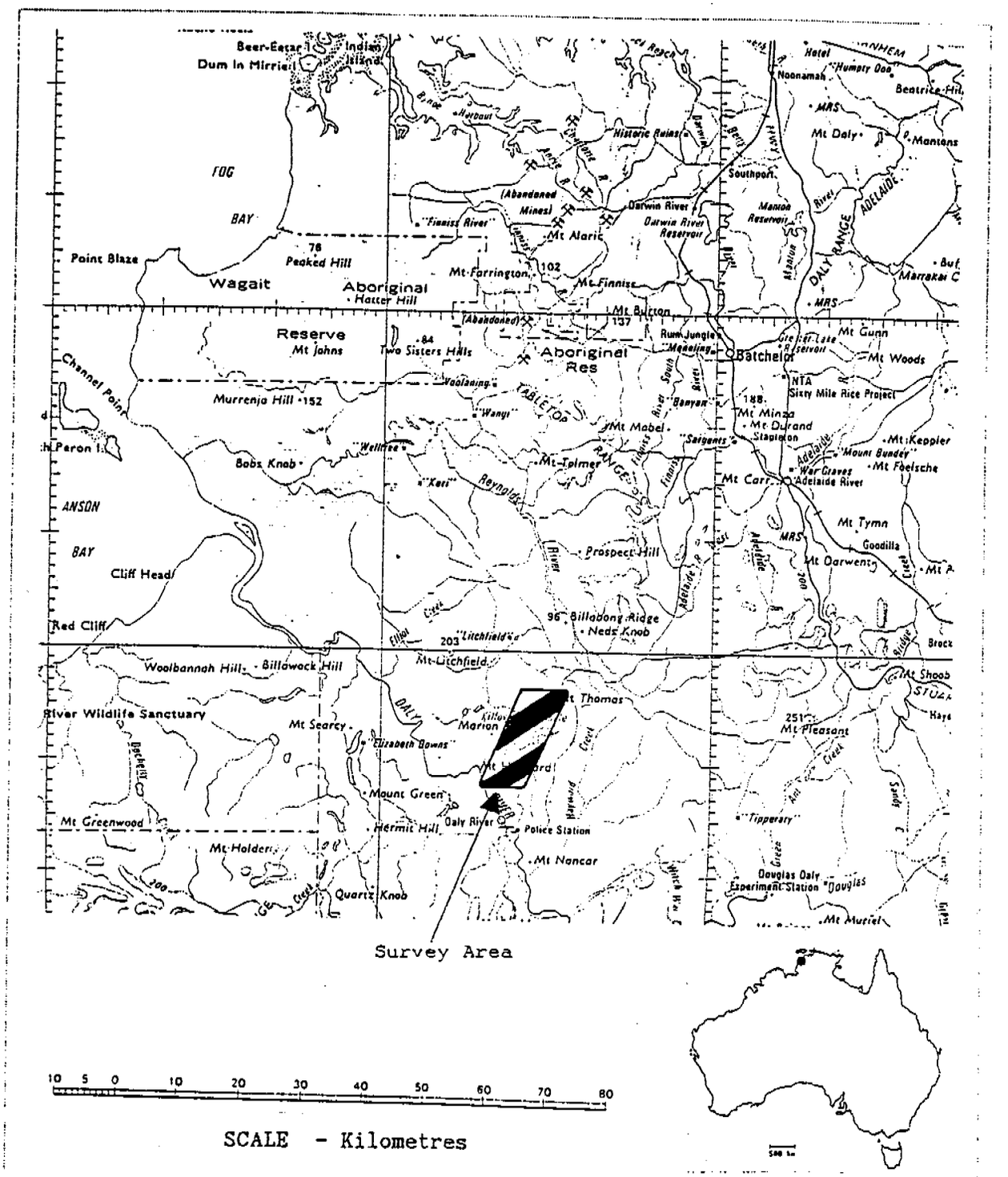


Figure 1 Location Map

1. SURVEY OPERATIONS SUMMARY

Base of Operations:	Katherine	
Aircraft:	CASA C212-200 Turbo Prop, VH-TEM	
Survey Specifications :	Type of survey:	Electromagnetic
	Survey size:	496 kilometres
	Line direction:	East/West
	Line spacing:	250 metres
	Minimum line length:	8.0 kilometres
	Nominal aircraft terrain clearance:	120 metres
	Nominal aircraft speed:	60 metres per second
Field Personnel:	Pilot/Project Manager:	T. Haldane
	Pilot	P. Mosman
	Electronics Technician:	T. Green
	Data Compiler:	T. Donnollan
	Geophysicist:	S. Reid
	Data Processor:	S. Reid

TABLE 1: Survey Progress

Flight 1:	9 June 1990
Flight 2:	11 June 1990

2. FLIGHT PATH RECOVERY

Flight path recovery is the location by image recorded on the aircraft video tape of the aircraft's position on photography to be used in map compilation.

Geoterrex Pty Ltd supplied aerial photography which consisted of two sets of 1:25,000 enlargements. One set of the photography was marked with control points whose positions are known in latitude/longitude and in AMG coordinates. The other set of photography was used in the construction of flight strips, for navigation.

The path recovery was carried out in the field onto the controlled photography. Identifiable points on both video and photography, no greater than two kilometres apart, were marked on both, with the fiducial number transferred from video tape to the recovery photograph. These recovered fiducials, joined by straight lines, constitute the flight path of the aircraft.

The recovered flight path was then digitised from the controlled set of photography. The AMG coordinates of each digitised recovered fiducial were determined by fitting a low order polynomial trend surface to the control point network to remove distortion. The position of each point was then calculated relative to the control surface. Erroneous points were checked by comparing the average aircraft speed between adjacent recovered fiducials (fiducial numbers being real time value in seconds) and the average speed for the whole line. Any significant speed changes over short intervals (1 or 2 kilometres) were noted and the surrounding recovery was checked for errors and corrected where necessary.

The difference in the computed coordinates of the transfer points was used to estimate the accuracy of the AMG coordinate transformation.

3. GEOTEM ELECTROMAGNETIC SYSTEM

3.1 EQUIPMENT AND SPECIFICATIONS

Model:	GEOTEM II

Geometry

Transmitter height (agl):	120 metres
Receiver bird height (agl):	54 metres
Tx - Rx horizontal separation:	115 metres

(agl - above ground level)

Transmitter

Coil axis:	vertical
Signal:	half sine wave current pulse
Base frequency:	125 Hertz
Repetition rate:	250 pulses per second
Pulse width:	1020 microseconds
Loop area:	231 square metres
Number of turns:	3
Peak Current:	600 amps
Tx loop dipole moment:	4.15×10^5 Am^2

Receiver

Coil axis:	horizontal, parallel to flight direction
Digitising rate:	32,000 samples/second
Pulses per reading:	31
Stored readings/second:	7
Gate distribution:	Combined Linear
Gate times:	Expressed below in micro seconds after transmitter shut-off.

Channel positions for 125 Hz

TABLE 2

CHANNEL NUMBER	125 Hz CENTRE (u secs)
1	369
2	541
3	650
4	822
5	963
6	1134
7	1353
8	1525
9	1728
10	1946
11	2181
12	2556

3.2 SYSTEM DESCRIPTION

GEOTEM is a time domain towed bird electromagnetic system incorporating a high speed EM receiver. The primary electromagnetic pulses are created by a series of discontinuous sinusoidal current pulses fed into a three turn shielded transmitting loop surrounding the aircraft and fixed to the nose, tail and wing tips. The pulse repetition rate is typically 125 Hz (250 bipolar pulses per second) or 75 Hz (150 bipolar pulses per second). Each transmitted current pulse lasts 1020 microseconds, followed by 2980 microseconds off time for 125 Hz (5646 microseconds for 75 Hz). Peak current through the loop is 600 Amps, resulting in a primary magnetic dipole moment of $4.15 \times 10^5 Am^2$.

The EM sensor is a wire coil wound around a ferrite core mounted horizontally in a "bird", towed by the aircraft on a 135 metre long cable. The cable is demagnetised to reduce noise levels. Mean terrain clearance for the aircraft is about 120 metres with the bird being situated 66 m below and 115 metres behind the aircraft. The geometry of the system is displayed in Figure 2A.

For each primary pulse a secondary magnetic field is produced by decaying eddy currents in the ground. These in turn induce a voltage in the receiver coil which is in proportion to the electromagnetic field. This voltage is sampled over 20 time gates whose centres and widths are software selectable and which may be placed anywhere within or outside the transmitter pulse. (Figure 2B)

The signals received from each sample pass through anti-aliasing filters and are then digitised with an A/D converter at sampling rates of up to 100 khz. The digital data stream from the A/D converter passes into an array processor where all the numerically intensive processing tasks are carried out. The array processor is under control of a multi-tasking minicomputer. The on-board processing sequence is as follows:

Transient Analysis: Wide-band frequency analysis enables the separation of noise from signal in real time;

Digital Stacking: The stacking of 31 transients (125 Hz) to produce 1 recorded reading, of which 7 are recorded every second;

Windowing of Transient Data: The transient is initially sampled over 250 channels which are then amalgamated to form 12 channels.

At a normal survey altitude of 120 metres terrain clearance, the typical effective penetration depth of the system is estimated to be 200-300 metres, dependent on conductivity contrast between the target and host rock, target size and attitude and overburden conductivity.

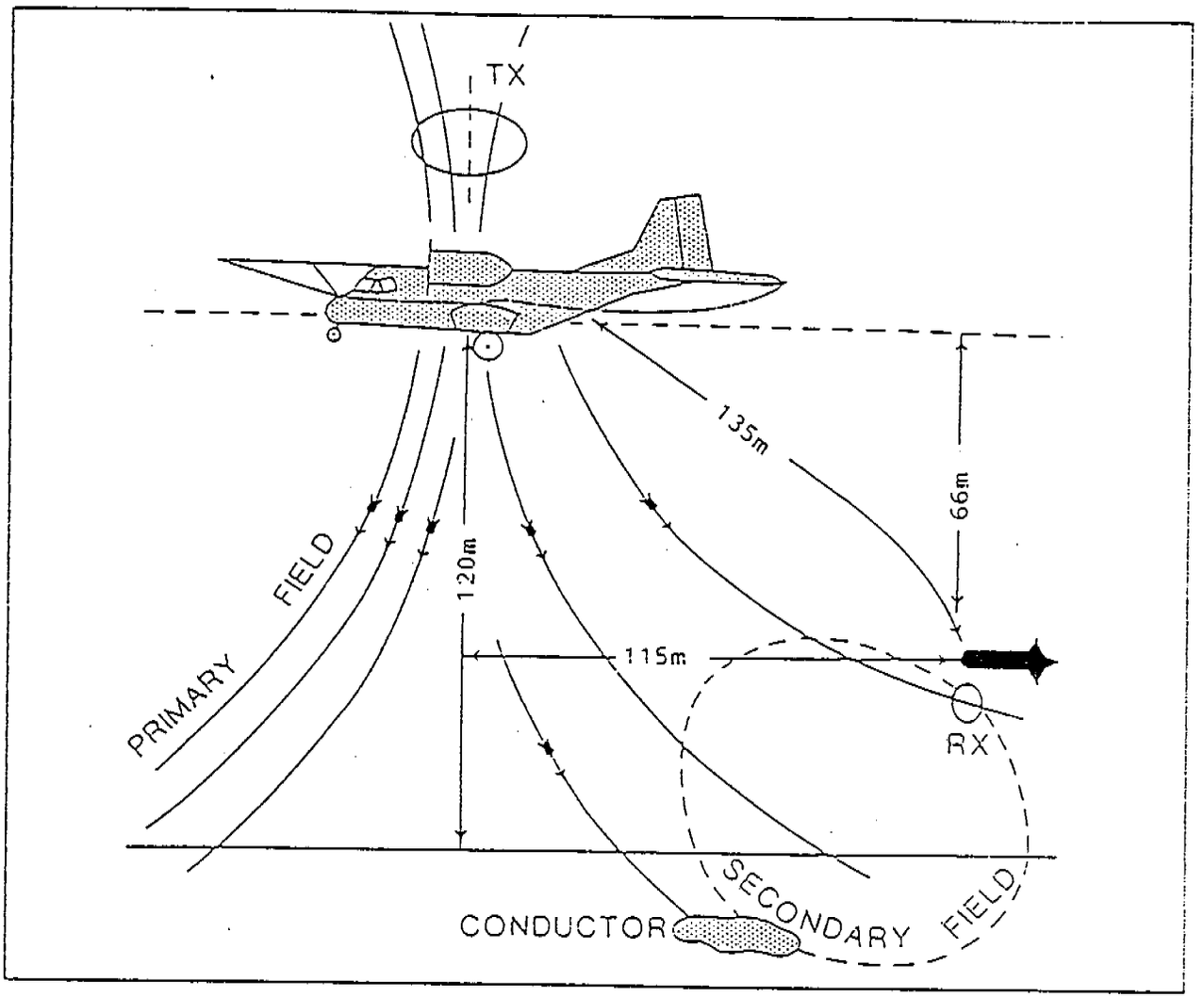
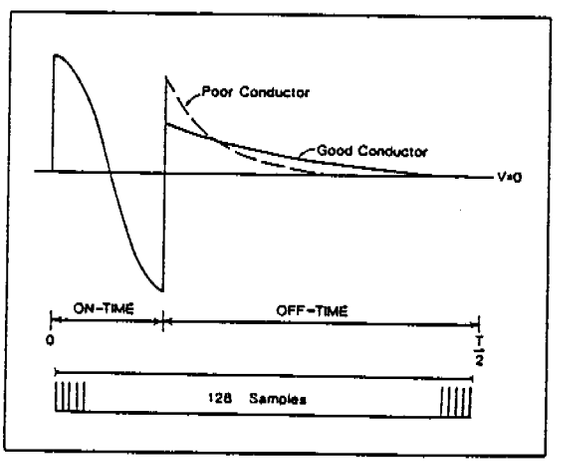


Figure 2A System Geometry



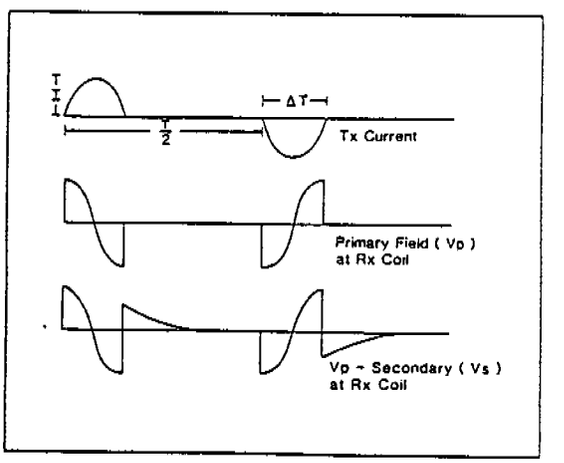


Figure 2B Sampling and Wave Form

3.3 SYSTEM CALIBRATION

All checks and adjustments are performed at high altitude at the start of each flight to allow for automatic compensation and calibration at survey altitude.

Compensation. During the flight, the transmitter creates eddy currents within the structure of the aircraft that have measurable effects at the receiver coil. Compensation for this signal is effected numerically within the receiver by a statistical analysis of the signal at the bird in the absence of ground response (by flying at an altitude in excess of 600 m above ground level). The observed signal is used to define a compensation signal which is subtracted from the observed to produce a null and thus effectively buck out any response due to changing geometry between receiver and transmitter.

Normalisation. All EM response channels are automatically calibrated and reduced to parts per million of the primary field in the receiver. This is achieved by dividing the measured voltage by the voltage induced by the primary field at the bird.

3.4 DATA PROCESSING

Levelling

GEOTEM is a very low drift and self calibrating system, with little necessity for data levelling.

Synchronisation Lag

A 4.3 second lag correction is applied to the digital GEOTEM values to synchronise them with the flight path.

Spheric Removal

Individual spheric events are removed by the application of a check on each individual reading, and a statistical check along each channel of data. The software prevents the removal of more than 3 consecutive readings (0.4 seconds of data) to minimize data distortion of true ground response.

Filtering

The GEOTEM data is filtered with a 1.4 second cut-off filter to reduce high frequency scatter with minimal effect to the narrowest possible real anomalies (wavelength of about 4 seconds).

4. MAGNETOMETER SYSTEM

4.1 SPECIFICATIONS

Model: Scintrex caesium vapour optical absorption magnetometer

Mounting: Tail stinger

Sample interval: 140 milliseconds, once per second *

Sensitivity: 0.10 nT

* To operate both the GEOTEM system and the magnetometer system simultaneously, the GEOTEM transmitter is switched off for a period of 140 milliseconds every second to allow for a noise free magnetometer reading.

5. AUXILIARY EQUIPMENT

5.1 DATA ACQUISITION SYSTEM

Model: Geoterrex Pty Ltd MADACS

Program: EM25

The MADACS is a computer based software system using an Interdata 6/16 mini-computer. This processor is linked to two Digi-Data Model 1600 magnetic tape drives. These tape drives have a feature which allows checking of the recording process as many times as the particular application permits. The checking procedure includes elimination of errors due to bad tape spots. Multiple buffers permit recording, processing and acquisition of data to be carried out simultaneously with no dead time. The system uses an IBM compatible laptop for operator-system communication.

The key feature of this system is that all data collection, verification, buffering, and recording is software-controlled. Therefore, the acquisition system may be economically altered to fit almost any requirement. Critical parameters are automatically monitored during flight, with visual and aural alarms provided for the operator.

Survey parameters are displayed during flight in their correct physical units, making operator comparisons simple. The survey program operates on a request-response basis, with the system pre-empting the operator and rejecting all illegal responses.

The MADACS is used to control and command the operations of all the ancillary equipment. This includes the GEOTEM receiver, magnetometer, camera, altimeter, tape drive and analogue chart recorder.

The system is based on a precision clock. Time is digitally recorded as a six-figure number called a "fiducial". A fiducial number equals the real time in tenths of seconds after midnight, for example, 000000 corresponds to midnight and 360000 corresponds to 10.00am. Fiducials are generated on digital tape, video tape and analogue charts at ten second intervals. The fiducial numbers do not increment by units, they are calculated from the clock time by the computer. This system does not require digital recording of line numbers, part numbers and line direction, thus avoiding a source of digital recording errors. These are recorded on the flight log by the operator.

The MADACS data acquisition system has the following specifications and features :

Precision clock: The system is controlled by a precision clock which allows data to be collected at any multiple of 0.1 seconds.

Computer: The system is based on an Interdata 6/16 mini-computer. The computer has the following interfaces:

- **Digital Input/Output Bus**
  This bus is capable of recording from, writing to, testing and controlling 16 external digital devices.

- **Analogue Input Module**
  This module has 16 analogue inputs with 12 bit resolution.

- **Analogue Output Module**
  This module has 12 analogue outputs with 12 bit resolution.

- **Magnetic Tape Controller**
  This interface/controller is capable of handling four 9-track NR21 tape transports. Tapes are written in an IBM compatible binary format with full parity, cyclic redundancy and longitudinal check characteristics.

- **Magnetometer Interface**
  This interface converts the signal from the high sensitivity caesium vapour magnetometer into a format acceptable to the MADACS.

- Camera Controller
  The interface allows the MADACS to control and monitor all aspects of the tracking camera's operation. A video screen provides constant monitoring of camera operation to the operator.

- Operator's Console
  This is an IBM compatible laptop computer, via which the operator communicates with the system. While on line during survey, all parameters are continuously displayed on the monitor unless the system senses an abnormal condition in which case a diagnostic message and the time sensed are displayed. The message remains until acknowledged by the operator.

Recorded Digital Data

Each second:	Flight number
	Time
	Altitude
	Total magnetic field
Each 0.14 seconds:	20 EM gates
	Transmitter primary field
	50 Hertz monitor

5.2 TRACKING CAMERA

Model: Sony DXC101P Video Camera

The tracking camera is equipped with a 4 mm wide-angle lens. The video tape is synchronised with the geophysical record by a digital fiducial display that increments every tenth of a second. These fiducials are recorded on the video tape and displayed on the bottom left of the video screen. Times are recorded from the digital information provided by the MADACS system.

5.3 ALTIMETER

Model:	Sperry Stars AA200 radio altimeter system
Sample interval:	1.0 second
Accuracy:	+/- 1.5% of indicated altitude.
Synchronisation:	The average of the output of the altimeter over each second is calculated and assigned to the time recorded at the end of each sample.

The Sperry radio altimeter is a high quality instrument whose output is factory calibrated. It is fitted with a test function which checks the calibration of a terrain clearance of 100 feet and altitudes which are multiples of 100 feet.

5.4 ANALOGUE RECORDER

Model:	RMS GR33 Thermal Dot Matrix Printer
Chart speed:	11 cm/minute; time increases from left to right
Chart width:	30.5 cm
Event marks:	20 second marks are recorded on the bottom of the chart with the associated fiducial numbers being printed at the base of the chart.

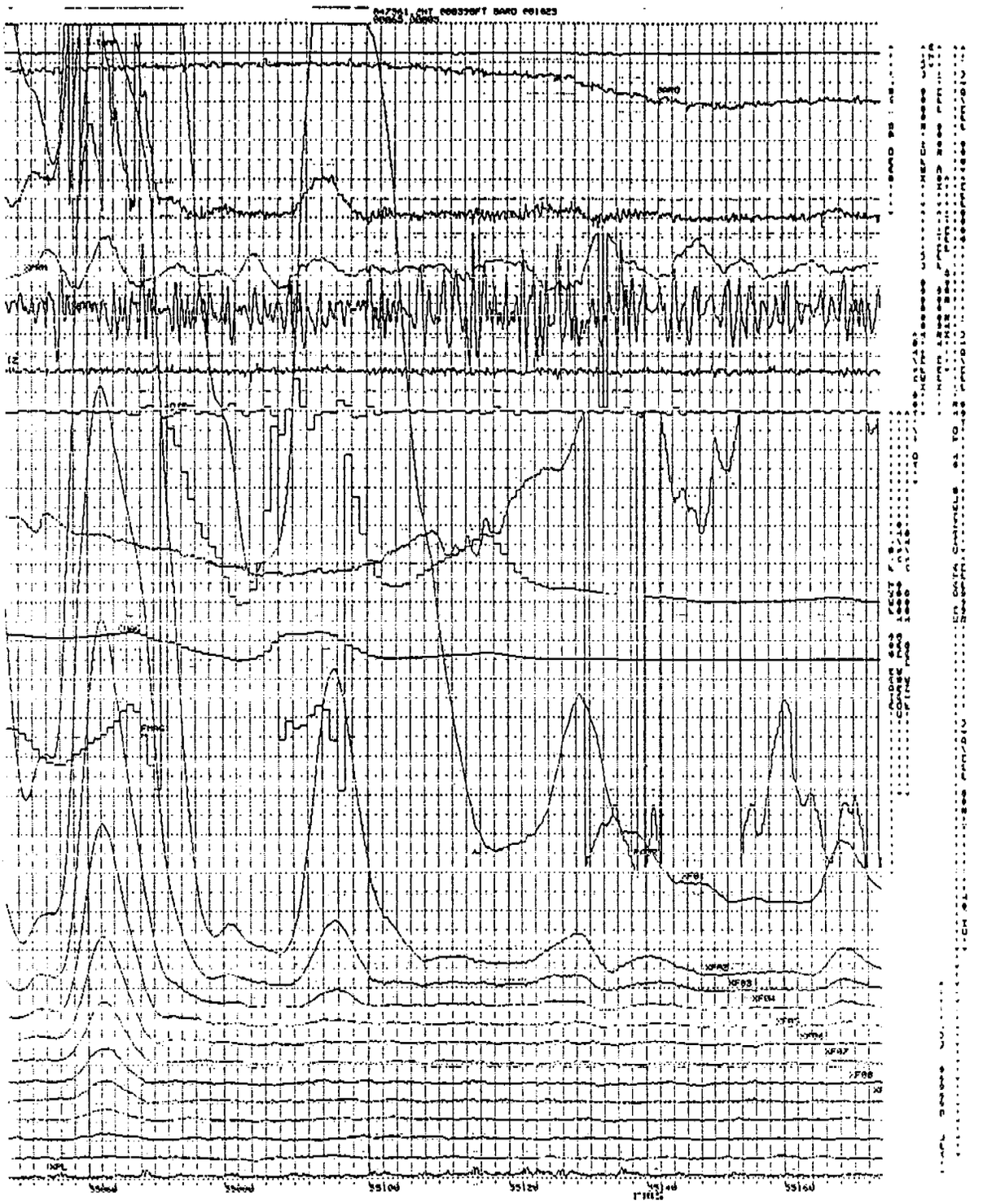
Channels recorded & Scales

Barometer	-	22 mB/cm
Chan 3 noise monitor	-	500 ppm/cm
Primary field monitor	-	0.25 volts/cm
Chan 12 noise monitor	-	500 ppm/cm
Magnetic field fourth difference	-	10 nT/cm
Total magnetic field		
Fine scale	-	20 nT/cm
Coarse scale	-	200 nT/cm
Terrain clearance	-	15 metres/cm
GEOTEM ch 1 - 12	-	200 ppm/cm
50 Hz monitor	-	0.1 volts/cm

A sample analogue record is shown in Figure 3.

Zero Positions: These zero positions are annotated on the analogue sample.

Synchronisation: A lag of 5.0 seconds occurs between the GEOTEM channels and the magnetometer, altimeter traces.



Sample Analogue Record

6. SURVEY PRODUCTS

6.1 DELIVERABLE ITEMS

Final Flight Path Maps at 1:25,000 scale (ink on plastic)
Interpretation map at 1:25,000 scale (ink on plastic)
Multi-parameter Profile plots at 1:25,000 scale
Channel amplitude contour maps
Located data tape
Located data tape summary
Recovered line listing
Mileage list
Flight logs
All recovery photography
Flight path video tape
Flight strips
Logistics/Interpretation report
Results and records of all test procedures performed

6.2 MULTI-PARAMETER PLOTS

The final GEOTEM data is presented as multi-parameter profiles plotted at suitable scales on a fiducially annotated X-axis as listed below, from top to bottom. The horizontal scale is 1:25,000. The GEOTEM channels are plotted over separate scales to optimise the high dynamic range of the EM signal.

TABLE 3

	Channel	Trace Colour	Scale
AXIS 1			
	Coarse Magnetics	Red	400 nT/cm
	Fine Magnetics	Green	80 nT/cm
	Aircraft Altitude	Black	20 m/cm
AXIS 2			
	GEOTEM Channel 1	Black	2000 ppm/cm
	GEOTEM Channel 2-3	Blue	1000 ppm/cm
	GEOTEM Channel 4-5	Green	600 ppm/cm
	GEOTEM Channel 6-12	Red	400 ppm/cm
	50 Hz Monitor	Black	0.1 volts/cm

6.3 DATA TAPES AND FORMAT

A located data tape for each survey area was produced in a format described overleaf.

GEOPEKO LIMITED
DALY RIVER, NT
ELECTROMAGNETIC SURVEY
LOCATED DATA TAPE FORMAT

COLUMN	DESCRIPTION
1 - 4	FLIGHT NUMBER
5 - 12	LINE
13 - 20	FIDUCIAL
21 - 28	AMG EASTING
29 - 36	AMG NORTHING
37 - 44	TOTAL MAGNETIC FIELD
45 - 48	RADAR ALTIMETER
49 - 54	GEOTEM CHANNEL 1
55 - 60	GEOTEM CHANNEL 2
61 - 66	GEOTEM CHANNEL 3
67 - 72	GEOTEM CHANNEL 4
73 - 78	GEOTEM CHANNEL 5
79 - 84	GEOTEM CHANNEL 6
85 - 90	GEOTEM CHANNEL 7
91 - 96	GEOTEM CHANNEL 8
97 - 102	GEOTEM CHANNEL 9
103 - 108	GEOTEM CHANNEL 10
109 - 114	GEOTEM CHANNEL 11
115 - 120	GEOTEM CHANNEL 12
121 - 126	GEOTEM 50 HZ MONITOR

Record length	=	126 Bytes
Block size	=	8064 Bytes
Code	=	9-Track ASCII
Density	=	1600 bpi

CONDUCTOR - DR3 Priority - 3

LOCATION : Map 1 of 1 of Daly River; Southern Area - Northeast corner.

Line	Fiducial	Depth	CTP	Chan	Comment
156.1W	51897.0	Medium	8	10	Migration to the west

INTERPRETATION :

Strike	Single Line Response
Length	250 metres
Depth	Medium
Dip	May be a tabular body
Plunge	Single Line Response
Width	90-120 metres
Magnetics assoc	No obvious association
Photo Assoc	Coincident with a creek.

COMMENT :

* The conductor is within a resistive environment, the response of the host being relatively flat.

* In contrast with the host the anomaly is wide with mid-to-late channel response, and of different character.

CONDUCTOR - DR4 Priority - 2

LOCATION : Map 1 of 1 of Daly River; Southern Area - Northeast corner.

Line	Fiducial	Depth	CTP	Chan	Comment
154.1W	52418.0	Medium	18	11	
153.1E	52777.4	Medium	20	10	Has slower decay rate than adjacent response to the west.
152.1W	52944.5	Medium	15	11	
150.1W	53441.5	Shallow	9	8	Wider than other anomalies in the trend

INTERPRETATION :

Strike	$9^0/189^0$
Length	700-800 metres
Depth	Medium
Dip	Possibly dipping to the west
Plunge	None apparent
Width	20-60 metres
Magnetics assoc	No obvious association
Photo Assoc	In a creek system.

COMMENT :

* The host is relatively resistive and is characterised by a flat response.

* The conductor is within a trend that lies along the Giants Reef fault.

Continued next page

* Along the trend a second peak occurs to the west on alternate lines. This suggests a westerly dip of about 45^0

* These anomalies have been selected as they have a slower decay rate and narrower width than other responses in the trend. This suggests a separate source, that is structurally controlled.

* The most prospective area is line 152.

CONDUCTOR - DR5 Priority - 3

LOCATION : Map 1 of 1 of Daly River; Southern Area - Northeast corner.

Line	Fiducial	Depth	CTP	Chan	Comment
153.1E	52747.0	Shallow	5	7	
151.1E	53253.0	Shallow	6	7	Channel 1 response obscured

INTERPRETATION :

Strike	N-S
Length	700 metres
Depth	Shallow
Dip	May be a tabular or flat lying body
Plunge	None apparent
Width	70-100 metres
Magnetics assoc	No obvious association
Photo Assoc	Line 151 is coincident with a creek.

COMMENT :

* These anomalies show slower decay than the host response
* They are part of a conductive trend, however they are narrower and have a lower early channel amplitude than the other responses in the trend.
* These anomalies lie on the edge of a band of river and creek alluvium which passes through an area containing the Burrell Creek formation.

CONDUCTOR - DR6 Priority - 3

LOCATION : Map 1 of 1 of Daly River; Southern Area - Northeast corner.

Line	Fiducial	Depth	CTP	Chan	Comment
152.1E	53009.5	Shallow	10	12	Channel 1 response not apparent

INTERPRETATION :

Strike	Single Line Response
Length	200 metres
Depth	Shallow
Dip	Near vertical
Plunge	Single Line Response
Width	< 40 metres
Magnetics assoc	No obvious association
Photo Assoc	Lies on Survey Creek.

COMMENT :

* This anomaly is within a conductive regime.
* Its geological setting is river and creek alluvium.
* It is narrower, and has a stronger late channel response than the surrounding surficial response.

APPENDIX A INTERPRETATION - BACKGROUND

TARGET DIFFERENTIATION

One of the most important problems is the differentiation between types of bedrock conductors and between bedrock conductors and surficial responses.

Bedrock Conductors

The different types of bedrock conductors normally encountered are:

Graphites - (including many types of carbonaceous rocks)
Generally occurring in precambrian sedimentary formations and volcanic tuffs, often concentrated in shear zones. They are often characterised by long, multiple conductors lying in parallel bands. Conductivity is generally high.

Massive Sulphides - Syngenetic sulphides often correspond to long multiple conductors and their conductivities vary considerably. Pyrrhotite may cause a coincident magnetic anomaly.

Magnetite and some serpentinised ultrabasic rocks are conductive and magnetic.

Manganese oxide gives weak EM response.

Bedrock conductors that occur in long, relatively monotonous and sometime multiple zones following formational strike is usually graphitic. Massive syngenetic sulphides of long strike length can occur but are rare. Long formational structures associated with strong magnetic character may be indicative of banded iron formation. A 20 to 400 gamma magnetics anomaly associated with EM response may infer the presence of pyrrhotite.

Surficial Conductors

Includes clayey alluvium, residual soils, swamps, brackish ground-water and lateritic formations. Many surficial features are generally low to intermediate conductivity, broad horizontal sheets. Such features produce an asymmetric response with the GEOTEM system, where the stronger coupling (and therefore signal) is observed over the leading edge with a weaker response over the trailing edge. If the anomaly position shows a strong dependence on line direction, a surficial source is probable.

Cultural Conductors

This includes fences, pipelines, communication lines and railways can give rise to a GEOTEM response, the strength dependent on the grounding of the feature. Many of these features are accompanied with a response on the 50 hz monitor channel. Geological conductors can carry 50 Hz response in the vicinity of power-lines and appear as broad swells on the monitor record.

The amplitude, the rate of decay, and the anomaly width should not vary a great deal along any one man-made conductor, except for the variation in amplitude related to terrain clearance variation. A marked departure from the average response character along any given feature gives rise to the possibility of a second conductor.

APPENDIX B GROUND FOLLOW UP OF GEOTEM TARGETS

The following points should be considered when planning ground follow-up of GEOTEM data:

Cultural Conductors :
Though all priority targets are checked against photography and the 50 Hz monitor for possible cultural sources (ie. fences, power lines, buildings etc), such features can be easily missed due to poor quality photography. On occasion, the response from these features can be misleading with the appearance of a somewhat deeper vertical bedrock conductor.

A comment is made in the individual conductor descriptions if there is any doubt as to whether a particular target may be due to a cultural feature. In such circumstances, it is recommended that a visual examination of the site should be made to discount the possibility of man-made conductors.

Other Conductors
The positioning of a conductor from a GEOTEM anomaly may have errors of up to 100 metres due to accumulated errors in flight path recovery, picking the conductor centre from the anomaly (particularly in conductive background) and the translation to AMG co-ordinates. Locating the conductor centre on the ground creates additional errors unless there is good survey control within the area.

Those conductors that have not been discounted by the field geologist due to either geological or cultural considerations should be located by a ground electromagnetic system (as the objective of ground follow-up is to locate an EM target on the ground, a method that responds to the same physical parameters should be used).

Even in situations where a magnetic feature appears coincident with the GEOTEM response, magnetics should not be the sole method for locating the conductor on the ground unless the geologist feels there is a definite correlation with EM. Coupled with a magnetic sampling interval of 1 second and an allowable correlation error of 1-2 seconds translates to a possible 200 metre difference between the EM source and the magnetic source.

Due to errors in both positioning the conductor centre on a map and the ground location, a moving transmitter-receiver reconnaissance method should be used to locate the centre of the conductor. A portable slingram system (ie. EM34, Maxmin, Genie etc) is adequate for conductor depths to 50 metres in moderate host rock conductivity. Deeper targets require a large moving loop system (ie Sirotem, EM37). This should define the target adequately for positioning drill targets. Detailed along strike information is most economically achieved with large fixed loop configuration, where the loop edge is placed near to, and along strike of the known conductor.

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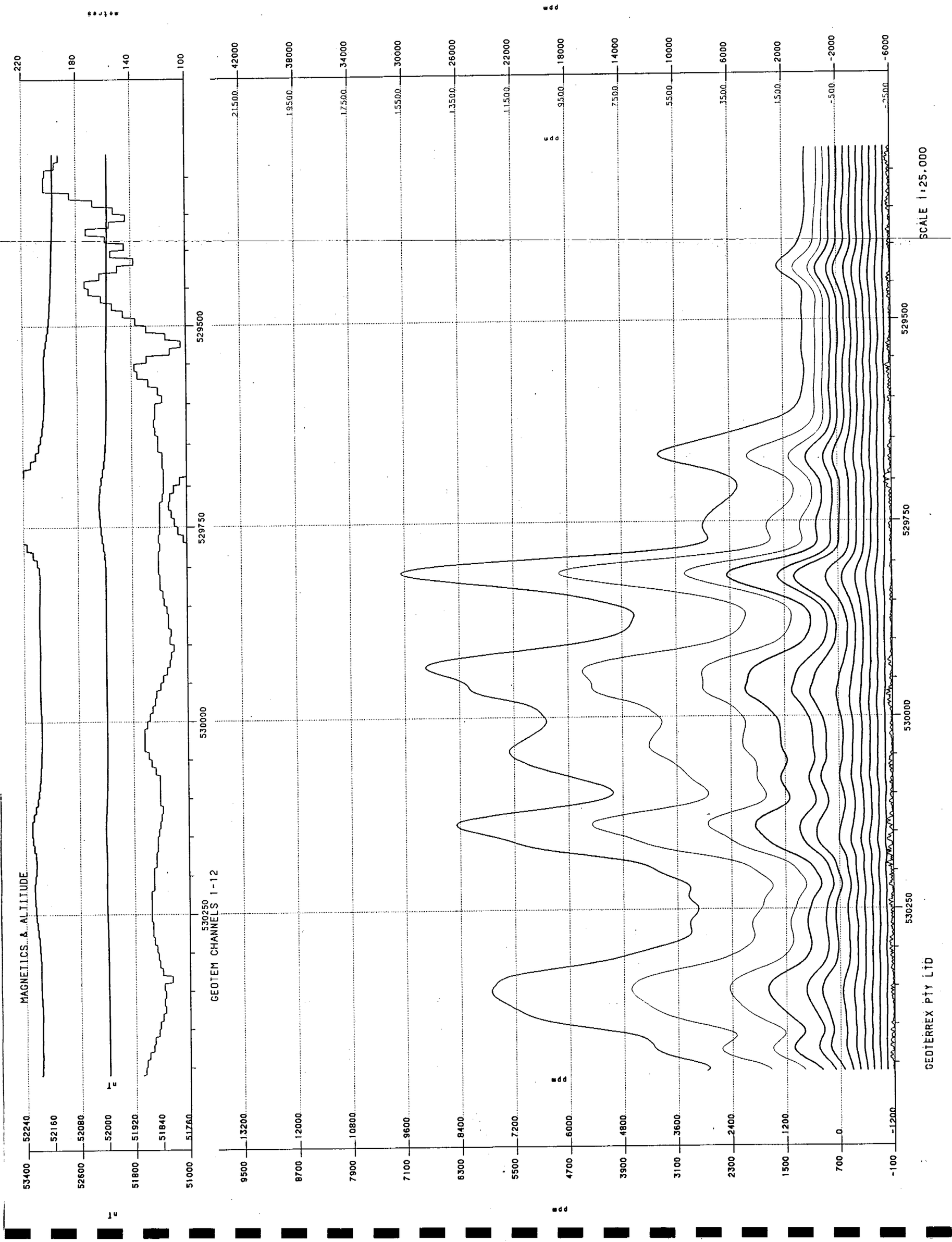
125 Hz GEOTEM SURVEY DALY RIVER 2-631

↓LINE 152/1



MAGNETICS & ALTITUDE

nT

53400 52240 52160 52600 52080 52000 51800 51920 51840 51000 51760

nT

220 180 140 100

metres

526750 527000 527250 527500 527750

GEOTEM CHANNELS 1-12

ppm

9500 13200 8700 12000 7900 10800 7100 9600 6300 8400 5500 7200 4700 6000 3900 4800 3100 3600 2300 2400 1500 1200 700 0 -100 -1200

ppm

21500 42000 19500 38000 17500 34000 15500 30000 13500 26000 11500 22000 9500 18000 7500 14000 5500 10000 3500 6000 1500 2000 -500 -2000 -2500 -6000

526750 527000 527250 527500 527750

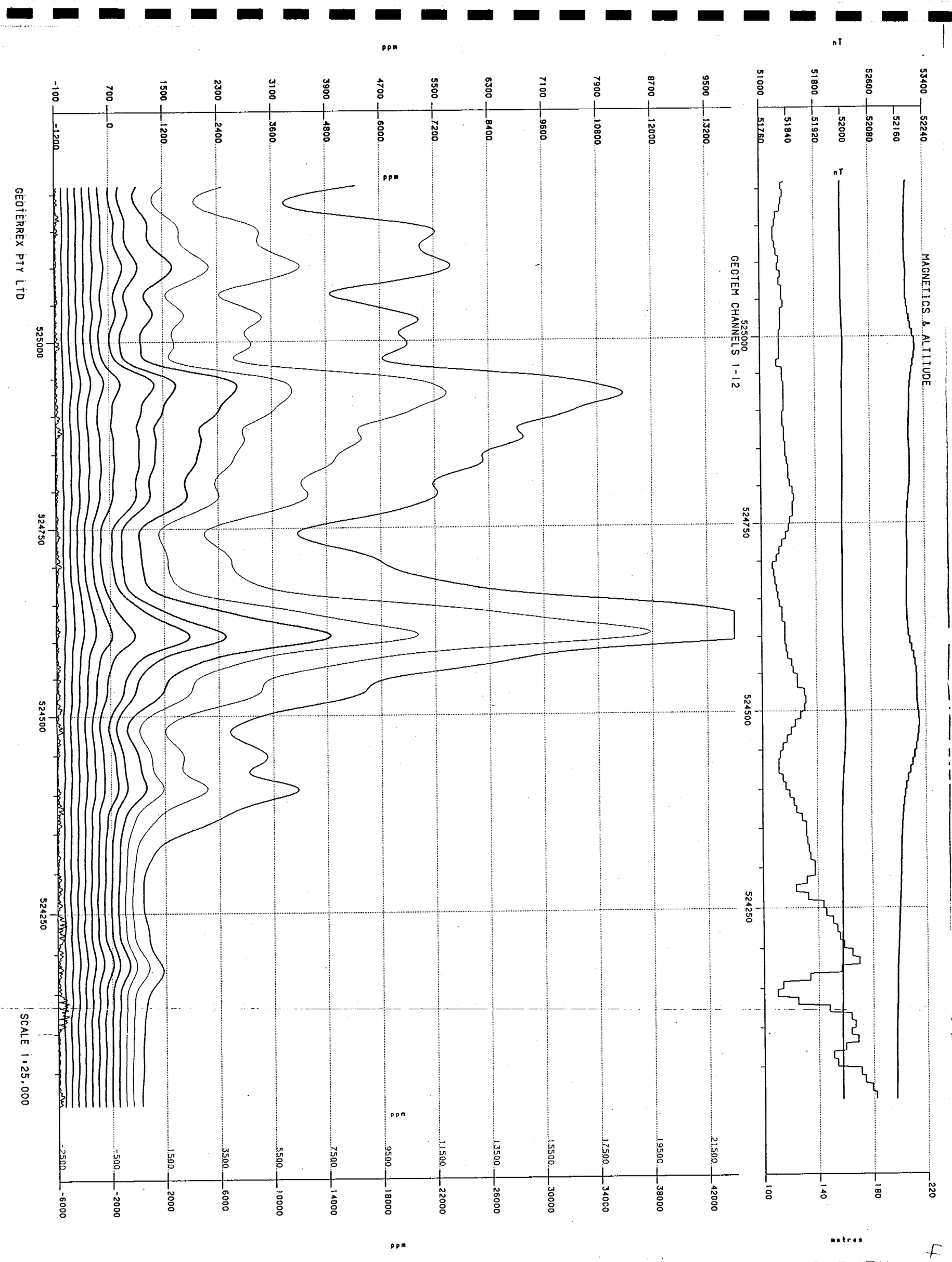
GEOTERREX PTY LTD

SCALE 1:25,000

LINE 153/1

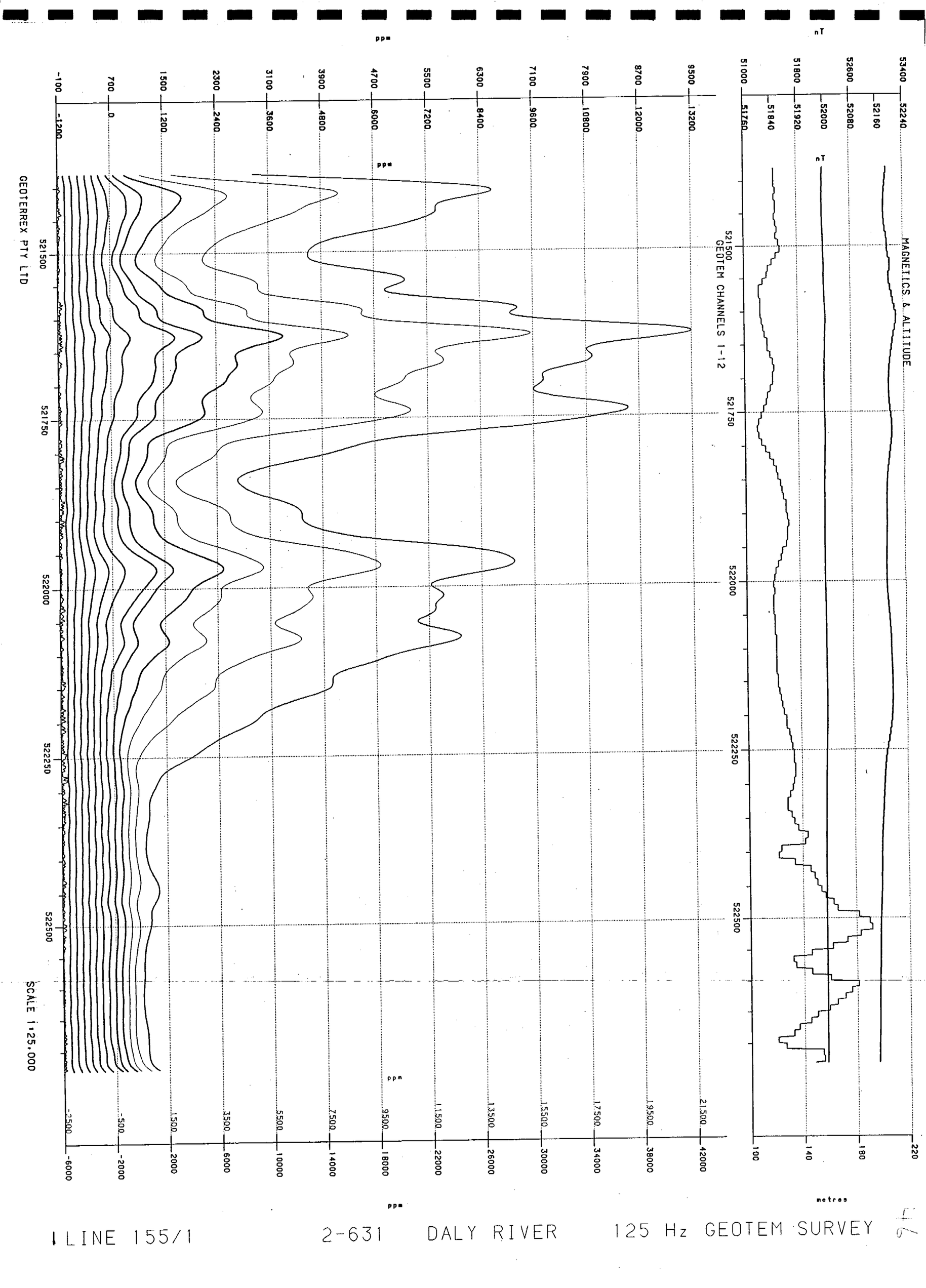
2-631 DALY RIVER 125 Hz GEOTEM SURVEY 4/4

PEKO WALLSEND OPERATIONS LTD



LINE 154/1 2-631 DALY RIVER 125 Hz GEOTEM SURVEY

BEKO VALLEND OPERATIONS LTD


MAGNETICS & ALTITUDE
GEOTEM CHANNELS 1-12
GEOTERREX PTY LTD
SCALE 1:25,000
LINE 155/1
2-631 DALY RIVER 125 Hz GEOTEM SURVEY
PEKO WALLSEND OPERATIONS LTD

MAGNETICS & ALTITUDE

nT: 53400, 52600, 51800, 51000 | 52240, 52160, 52080, 52000, 51920, 51840, 51760

metres: 220, 180, 140, 100

519750 519500 519250 519000 518750

GEOTEM CHANNELS 1-12

ppm: 9500, 8700, 7900, 7100, 6300, 5500, 4700, 3900, 3100, 2300, 1500, 700, -100 | 13200, 12000, 10800, 9600, 8400, 7200, 6000, 4800, 3600, 2400, 1200, 0, -1200

ppm: 21500, 19500, 17500, 15500, 13500, 11500, 9500, 7500, 5500, 3500, 1500, -500, -2500 | 42000, 38000, 34000, 30000, 26000, 22000, 18000, 14000, 10000, 6000, 2000, -2000, -6000

519750 519500 519250 519000 518750

GEOTERREX PTY LTD

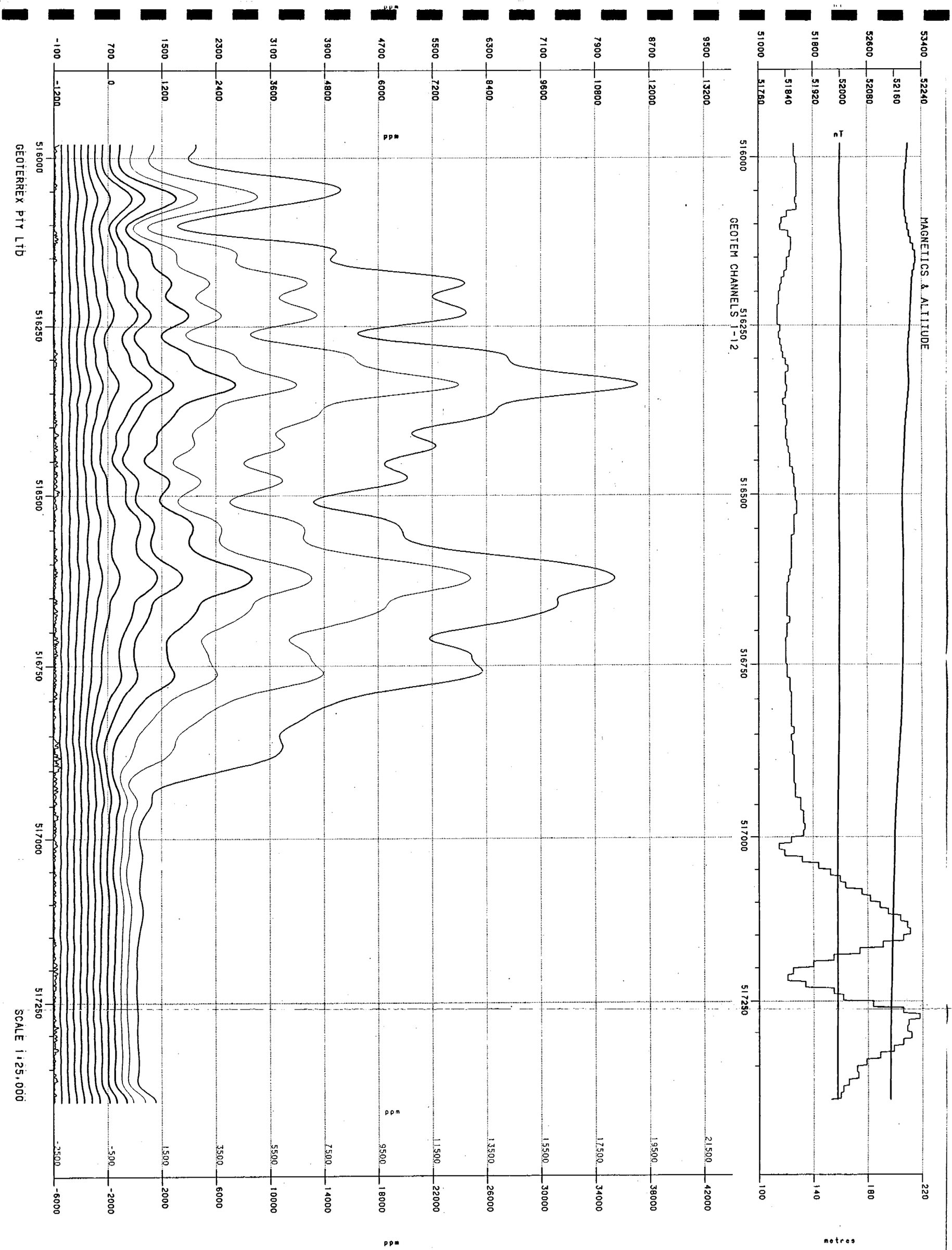
SCALE 1:25.000

PEKO WALLSEND OPERATIONS LTD

DALY RIVER 125 Hz GEOTEM SURVEY

2-631

LINE 156/1



LINE 157/1 2-631 DALY RIVER 125 Hz GEOTEM SURVEY

BEKO WALLSEND OPERATIONS LTD

MAGNETICS & ALTITUDE

nT: 53400, 52600, 51800, 51000 | 52240, 52160, 52080, 52000, 51920, 51840, 51760 | metres: 220, 180, 140, 100

498750 498500 498250 498000 497750

GEOTEM CHANNELS 1-12

ppm: 9500, 8700, 7900, 7100, 6300, 5500, 4700, 3900, 3100, 2300, 1500, 700, -100 | 13200, 12000, 10800, 9600, 8400, 7200, 6000, 4800, 3600, 2400, 1200, 0, -1200 | 21500, 19500, 17500, 15500, 13500, 11500, 9500, 7500, 5500, 3500, 1500, -500, -2500 | 42000, 38000, 34000, 30000, 26000, 22000, 18000, 14000, 10000, 6000, 2000, -2000, -6000

498750 498500 498250 498000 497750

GEOTERREX PTY LTD

SCALE 1:25,000

2-631 DALY RIVER 125 Hz GEOTEM SURVEY

LINE 201/1

PEKO WALLSEND OPERATIONS LTD

MAGNETICS & ALTITUDE

nT

53400 52240
52160
52800 52080
52000
51800 51920
51840
51000 51760

220
180
140
100
metres

500500 500750 501000 501250 501500 501750

GEOTEM CHANNELS 1-12

ppm

9500 13200
8700 12000
7900 10800
7100 9600
6300 8400
5500 7200
4700 6000
3900 4800
3100 3600
2300 2400
1500 1200
700 0
-100 -1200

21500 42000
19500 38000
17500 34000
15500 30000
13500 26000
11500 22000
9500 18000
7500 14000
5500 10000
3500 6000
1500 2000
-500 -2000
-2500 -6000

500500 500750 501000 501250 501500 501750

GEOTERREX PTY LTD

SCALE 1:25,000

PEKO WALLSEND OPERATIONS LTD

DALY RIVER 125 Hz GEOTEM SURVEY

2-631

LINE 202/1

MAGNETICS & ALTITUDE

nT

53400 52240 52160 52080 52000 51920 51840 51760 51800 51000

504250 504000 503750 503500 503250

GEOTEM CHANNELS 1-12

ppm

9500 13200 8700 12000 7900 10800 7100 9600 6300 8400 5500 7200 4700 6000 3900 4800 3100 3600 2300 2400 1500 1200 700 0 -100 -1200

-2500 -500 1500 3500 5500 7500 9500 11500 13500 15500 17500 19500 21500

-6000 -2000 2000 6000 10000 14000 18000 22000 26000 30000 34000 38000 42000

ppm

100 140 180 220

metres

GEOTERREX PTY LTD

SCALE 1:25,000

LINE 203/1 2-631 DALY RIVER 125 Hz GEOTEM SURVEY

RFKO VALLSEND OPERATIONS LTD

MAGNETICS & ALTITUDE

nT

53400 52240
52160
52800 52080
52000
51800 51920
51840
51000 51760

505750 506000 506250

GEOTEM CHANNELS 1-12

ppm

9500 13200
8700 12000
7900 10800
7100 9600
6300 8400
5500 7200
4700 6000
3900 4800
3100 3600
2300 2400
1500 1200
700 0
-100 -1200

505750 506000 506250

GEOTERREX PTY LTD

506500 506750 507000

SCALE 1:25,000

ppm

-2500 1500 5500 9500 13500 17500 21500
-6000 -2000 2000 6000 10000 14000 18000 22000 26000 30000 34000 38000 42000

ppm

100 140 180 220

metres

LINE 204/1 2-631 DALY RIVER 125 Hz GEOTEM SURVEY

BEKO WALLSEND OPERATIONS LTD

MAGNETICS & ALTITUDE

53400 52240
52160
52600 52080
52000
51800 51920
51840
51000 51760

nT

220
180
140
100

metres

509500 509250 509000 508750 508500

GEOTEM CHANNELS 1-12

9500 13200
8700 12000
7900 10800
7100 9600
6300 8400
5500 7200
4700 6000
3900 4800
3100 3600
2300 2400
1500 1200
700 0
-100 -1200

ppm

21500 42000
19500 38000
17500 34000
15500 30000
13500 26000
11500 22000
9500 18000
7500 14000
5500 10000
3500 6000
1500 2000
-500 -2000
-2500 -6000

ppm

509500 509250 509000 508750 508500

GEOTERREX PTY LTD

SCALE 1:25,000

S
3

DALY RIVER 125 Hz GEOTEM SURVEY

2-631

LINE 205/1

PEKO WALLSEND OPERATIONS LTD


EL6853
EL 5336
EL 5337
GEOTEM INTERPRETATION MAP
Grid notation refers to Australian Map Grid Zone 52
Recovered Fiducial 32768
Conductive Zone
High Priority Conductor
Medium Priority Conductor
Low Priority Conductor
Anomaly
CTP Estimate
Depth (Shallow, Medium, Deep)
Conductor Number
Conductor Trend
Magnetic Trend
Fault
Inferred Fault
CR91/433
INDEX TO ADJOINING MAPS
GEOPEKO
DARWIN
5070-IV-NE
TOPOGRAPHY, EL 6853
AIRBORNE GEOTEM SURVEY
FLIGHTLINE - INTERPRETATION