Normandy NFM Limited

NORTH FLINDERS EXPLORATION

report

THIRD AND FINAL REPORT FOR EL7871 (CHESTER)
FOR THE PERIOD TO 11 SEPTEMBER 1998

1:250,000 SHEET REFERENCE:	MOUNT SOLITAIRE	SF52-4
1:100,000 SHEET REFERENCE:	DAVIDSON	
	MINES & ENERGY	56/1
	NATIONAL MAPPING	5057

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□ NORMANDY NFM LIMITED

SM ADRICHEM & RA LONGMIRE OCTOBER 1998 RAL9810

SUMMARY

EL7871 has been surrendered after three years of tenure. This document serves as both an Annual Report for the third year of tenure, and a Final Report summarising all exploration carried out within the licence area since 12th September 1995.

Exploration during the third year of tenure was restricted to a small ground magnetic survey, instigated to investigate an aeromagnetic structure for indications of mineralisation.

- Ground Magnetic Survey (3 line km)
- Petrological Examination (6 samples)

The ground magnetic data failed to delineate any structural targets related to WNW trending aeromagnetic lineaments, and as a result the prospectivity of the licence area was downgraded and the decision to surrender the licence followed.

Exploration during the second year of tenure comprised:

- Lag Sampling (53 samples)
- Ground Magnetic Survey (8 line km)
- RAB Drilling (41 holes for 964m; 320 samples; 2880 analyses)

Refer to Longmire, R.A., and Adrichem, S.M. 1997. Second Annual Report for EL7871 (Chester) for the Year Ending 11 September 1997, for details of this period of work.

Exploration during the first year of tenure comprised:

- Interpretation of available Airborne Magnetic, Radiometric and TMI data
- Rock Chip Sampling (19 samples)
- Lag Sampling (185 samples)
- Gridding (12.5 line km)
- Ground Magnetic Survey (12.5 line km)
- RAB Drilling (18 holes for 925m; 308 samples; 616 analyses)
- Petrological Examination (20 samples)

Refer to Archibald, D.A.C. 1996. First Annual Report for EL7871 (Chester) for the Year Ending 11 September 1996, for details of this period of work.

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1. INTRODUCTION

EL7871 (Chester) is located 60km north-northeast of The Granites Gold Mine. Figure 1 indicates the location of EL7871 in relation to other Normandy NFM tenements in the Tanami region.

Normandy NFM has held tenure over EL7871 for thirty-six months. The licence area had been explored as a portion of EL5418, granted in May 1989 to Harlock Pty. Ltd., subsequently transferred to the Tanami Joint Venture, and then to Zapopan NL. EL5418 is currently held by Normandy NFM Limited.

Normandy NFM's interest in the area was prompted by the identification of a positive airborne magnetic anomaly, thought to be sourced in Mt Charles Beds, and intersected by a regional northwest trending lineament. There had been no direct testing of this feature. An apparent lack of Gardiner Sandstone or Antrim Plateau Volcanics overlying the Proterozoic basement suggested that prospective lithologies in the area may be amenable to bedrock drill testing.

2. TENEMENT DETAILS

EL7871 was applied for on 29th June 1992, and granted to Normandy NFM Limited (formerly North Flinders Mines Limited) on 12th September 1995. A 50% reduction of the licence area was effected in September 1997. The licence was surrendered on 16th October 1998.

TABLE 1: Tenement Summary, EL7871 (Chester)

	Date	Holding (Blocks)	Km²	Expiry Date
Grant:	12/09/95	32	103	11/09/01
First Relinquishment:	11/09/97	16	51	

3. LOCATION, ACCESS AND PHYSIOGRAPHY

Situated within the 1:250 000 map sheet SF52-4, the Chester tenement lies approximately 60km north-northeast of The Granites Gold Mine (Figure 1). Access from The Granites is via a well graded road to Windy Hill, then a further 32km north to the Chester licence area along a graded access track. The track, which bisects the tenement area from west to east, is also shown on Figure 1.

SE52-15 "TANAMI"

SE52-16 "TANAMI EAST"

SF52-03 "THE GRANITES"

SF52-04 "MOUNT SOLITAIRE"

129° 00'E

130° 00'E

131° 00'E

20° 00'S

500000E

600000E

700000E

7800000N

7700000N

WESTERN AUSTRALIA

NORTHERN TERRITORY

EL 8302
Kilii Kilii
Area 1

EL 8302
Kilii Kilii, Area 2

EL 7122
Mac Farlanes
Area 1

EL 7150
Talbot South

EL 7834
East Tanami

TANAMI

EL 6859
Wilsons
Range

Wilsons
Camp

EL 7122
Mac
Farlanes
Area 2

EL 2372
Mac Farlanes
Peak, Area 1

EL 2372
Mac Farlanes
Peak, Area 2

EL 2371
Kims Bore

Rabbit Flat

EL 2370
Rabbit Flat
Area 1

EL 2370
Rabbit Flat
Area 2

EL 2369
Mt. Ptilotus
Area 1

EL 2369
Mt. Ptilotus
Area 2

EL 5418, Area 1
Four Corners

EL 7871
Chester

EL 5418, Area 2
Windy Hill

EL 2367
Schist Hills

ML S154
'Dead Bullock
Soak'

EL 2366
Hordern Hills

ML S8
'The Granites'

EL 4529
The Window

ROAD

EL 2290
Billabong

EL 1060
De Bavay

EL 7121
Mt. Davidson

EL 7870
Sore Tooth South

EL 8278
Fortress

EL 7360
Erehwon
North

EL 6759
Thomsons

N

W

E

S

0

50km

SCALE 1:1,000,000

UTM Zone 52 (AGD66)

...\chest001.dgn

Normandy NFM Limited

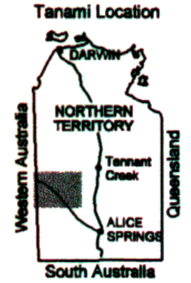
NORTH FLINDERS EXPLORATION

EL 7871 - CHESTER

TENEMENT LOCATION MAP

FIGURE 1
30 OCT 98

Tanami Location



4. PREVIOUS EXPLORATION BY OTHER COMPANIES

Whilst holding the ground as EL5158, Harlock Pty Ltd / Tanami Joint Venture / Zapopan undertook some preliminary exploration before relinquishing this portion in 1992. Their work included a review of historical and open file exploration data, acquiring and interpreting both Landsat TM data and Large Format Camera photography, plus a field program of geological reconnaissance and laterite sampling over a dipole magnetic anomaly. No anomalous results were returned from the sampling. The negative geochemical results, combined with the interpretation of other data, downgraded the prospectivity of the area now covered by EL7871.

5. EXPLORATION OBJECTIVES

During the first year of tenure the exploration objectives were to:

- Assess work already undertaken by Zapopan NL
- Carry out further reconnaissance lag and rock chip sampling
- Interpret airborne magnetic data in combination with SPOT satellite imagery
- Detail the magnetically anomalous target areas with a ground magnetic survey and model the results.
- Test the magnetic targets with a program of RAB drilling

During the second year of tenure the exploration objectives were to:

- Infill a 3km long arsenic anomaly identified from lag sampling in 1996
- Establish the relationship between the bedrock geology and arsenic anomalism
- Locate and resolve any subtle magnetic features in the area of interest

During the third year of tenure the exploration objectives were to:

- Test a regional magnetic NW trending structure for indications of mineralisation

6. GEOLOGY

6.1 Tanami Regional Geology

The Granites-Tanami Goldfield lies in the eastern part of the Early Proterozoic Granites-Tanami Inlier which is part of the Northern Australian Orogenic Province (Plumb 1990). The Inlier abuts the Arunta Complex to the south and east and is onlapped by younger cover sequences including the extensive Paleozoic Wiso Basin on its northeastern margin. To the west, clastic sediments of the Middle Proterozoic Birrindudu Basin overlie and separate the Inlier from similar age rocks in the Halls Creek Province.

Tertiary drainage channels, now completely filled with alluvial and lacustrine clays and calcrete are a major feature of the region. Some drainage profiles are 10 km wide and 100m deep, presenting a formidable barrier to mineral exploration.

Gold mineralisation within the NFM tenement holding is hosted by the Mt Charles Beds, a sequence of fine to medium-grained turbiditic metagreywackes with lesser amounts of metapelite, graphitic schist, banded iron-formation, chert and basic volcanic rocks (Blake et al 1979). Owing to their more resistant nature, only the cherts and iron-formations and associated interbedded graphitic schists tend to outcrop above the sand plain.

A suite of syn-to post-deformation dolerites and gabbros frequently invade the graphitic schist components of the sequence. Large plutons of mostly undeformed late-to post-orogenic adamellite and minor more mafic variants comprising The Granites Granite suite are widespread throughout the area.

Residual hills of gently folded Carpentarian Gardiner Sandstone unconformably overlie Early Proterozoic lithologies. Younger flatlying Cambrian Antrim Plateau Basalts are also preserved as platform cover in areas protected from erosional stripping.

Complex, polyphase deformation during the Barramundi Orogeny has affected the entire Granites-Tanami Inlier. It appears to have been largely controlled by two sets of regional scale fundamental crustal fractures that trend NNE and WNW. This is evidenced by the orientation of successive phases of macroscopic folding in the region and the consistent sympathetic trends of late tectonic faults.

Peak metamorphism during the Barramundi Orogeny reached amphibolite facies at The Granites Gold Mine, but is more generally greenschist facies as at Dead Bullock Soak. Contact metamorphic aureoles, commonly identified in pelitic schist units by randomly orientated andalusite porphyroblasts, are well developed at the margins of the post-orogenic granite plutons.

6.2 Tenement Geology

The land surface typically comprises a gently undulating lateritised surface covered in part by aeolian sand in the northeastern sector. A prominent laterite plateau is present in the centre of the tenement.

Outcrop of bedrock is very rare. Isolated patches of quartz tourmaline vein material, lateritised mafic rock and schistose greywacke have been observed. Quartz and lateritic scree present over aeolian sand is thought to be derived locally, particularly by bioturbation.

RAB drilling penetrated a largely insitu and complete laterite weathering profile developed over intrusive mafic rocks. The regolith profile includes pisolitic laterite, mottled clay and plasmic clay in the pedolith zone. The saprolith zone consists of saprolite and saprock. The profile is partially stripped to the north of the residual laterite plateau, and this stripped profile disappears beneath superficial aeolian depositional material further north.

The broad lithological units within the intrusive complex are;

Cumulus Rocks

- cumulus norites with amphibole, orthopyroxine, clinopyroxine and rare olivene
- possible pyroxinite

Non Cumulus Rocks

- microgabbros to microgabbronorites with plagioclase lathes and intergranular pyroxine
- gabbronorites, occasionally porpheritic plagioclase, with hornblende and biotite
- quartz diorite and quartz gabbros

7. WORK UNDERTAKEN DURING THE THIRD YEAR OF TENURE

7.1 Ground Magnetic Survey

A ground magnetic survey was conducted over WNW trending aeromagnetic lineaments located in the western portion of EL7871.

The survey, which comprised 3 traverses identified as lines A, B & C on Figure 2, was conducted by Normandy NFM personnel by the methods outlined in Appendix 1 of this report.

TABLE 2: Chester Ground Magnetic Survey Details

Line ID	AMG Easting	AMG Northing	Bearing (AMG North)	Length (km)
A	664625	7781075	038°	1
B	665425	7780500	038°	1
C	666200	7779875	038°	1
3 lines				**3 line km**

No significant magnetic features were detected by this survey and as a result, the prospectivity of the area was downgraded.

Profiled data for each of the lines is provided as Appendix 2.

7.2 Petrology

Three drill chip samples were sent to both Pontifex and Associates and Mason Geoscience Limited for petrological examination as tabled below. The drill chips were collected from RAB holes CMRB024 and CMRB028, drilled during the second year of tenure (refer to Second Annual Report for EL7871 Chester for the Year Ending 11 September 1997).

TABLE 3: Petrological Examination of Drill Samples

Drillhole	Sample Depth	Rocktype
CMRB024	36-39m	Carbonate Sediment
CMRB024	39m-42m	Biotite Schist/ Biotite Graniodiorite
CMRB028	39m-42m	Carbonate Sediment

Petrological descriptions are attached as Appendix 3.

665000E 670000E 130° 40'E 675000E 680000E

7780000N

20° 05'S

EL 7871
Chester

Line A

Line B

Line C

CMRB017
CMRB016
CMRB015
CMRB014
CMRB013
CMRB012
CMRB011
CMRB010
CMRB009
CMRB008
CMRB018
CMRB007
CMRB006
CMRB001
CMRB002
CMRB003
CMRB004
CMRB042
CMRB031
CMRB005
CMRB043
CMRB053
CMRB032
CMRB023
CMRB033
CMRB054

7775000N

665000E 670000E 130° 40'E 675000E 680000E

N
W E
S

0 1km
SCALE 1:50,000

UTM Zone 52 (AGD66)

Area Relinquished 11/09/97

Ground Magnetic Traverse

RAB Drillhole

Normandy NFM Limited
NORTH FLINDERS EXPLORATION

EL 7871 - CHESTER

GROUND MAGNETIC TRAVERSE & RAB DRILLHOLE LOCATION PLAN

30 OCT 98

FIGURE 2

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8. WORK UNDERTAKEN DURING YEARS 1 AND 2

8.1 Airborne Geophysics Data

Available airborne magnetic and radiometric data with a flight line spacing of 400m was imaged and interpreted at a scale of 1:50,000. Total magnetic intensity (TMI) images were used for the identification of magnetic features and first vertical derivative. For TMI and Total Count Radiometric images, refer to First Annual Report for EL7871 Chester for the Year Ending 11 September 1996.

8.2 Ground Magnetic Surveys

Two ground magnetic surveys were conducted for a total of 20.5 line km over the 13 lines located in the south-central portion of the tenement area (Figure 3).

The first survey (refer to First Annual Report for EL7871 Chester for the Year Ending 11 September 1996) targeted a high amplitude aeromagnetic feature and successfully outlined bodies of higher magnetic susceptibility than the surrounding rocks, providing the basis for a subsequent RAB drilling program.

A second survey (refer to Second Annual Report for EL7871 Chester for the Year Ending 11 September 1997) was undertaken to locate any subtle magnetic features in an arsenic anomalous area defined by lag sampling. No magnetic anomalies were found to be associated with the anomalous surface geochemistry.

8.3 Surficial Sampling

A reconnaissance lag sampling program was completed throughout the entire licence area. Lag samples were collected at a 500 x 500m spacing over the central magnetic feature and at a spacing of 500m x 1000m wherever possible over the rest of the tenement.

Of the 185 samples collected six were considered arsenic anomalous (<82ppm) and a further 53 infill samples were collected. Results confirmed but failed to upgrade the anomaly. Refer to First Annual Report for EL7871 Chester for the Year Ending 11 September 1996 for results from the first episode of lag sampling and Second Annual Report for EL7871 Chester for the Year Ending 11 September 1997 for results from the infill episode of lag sampling.

A total of 19 rock chip samples (refer to First Annual Report for EL7871 Chester for the Year Ending 11 September 1996) were collected from outcrop, sub-outcrop and scree patches wherever suitable sampling sites were encountered.

All surficial sample locations are plotted on Figure 3.

8.4 RAB Drilling

A traverse of RAB drilling (27 holes) was completed over a magnetic high located in the centre of the tenement to identify the cause of the magnetic high and to test for any associated mineralisation. No anomalous results were returned.

A further 32 holes were drilled to sample below the lateritic profile. This drilling confirmed the residual nature of lateritic profile thus substantiating the suitability of lag sampling in the area. No anomalous geochemistry was returned.

Refer to First Annual Report for EL7871 Chester for the Year Ending 11 September 1996 and Second Annual Report for EL7871 Chester for the Year Ending 11 September 1997, for results of both episodes of RAB drilling. Drillhole locations are plotted on Figure 2.

8.5 Petrology

Mineralogical examination of 20 RAB drill samples (collected from holes CMRB001 - CMRB020) was undertaken by consultant petrologists Pontifex and Associates Pty Ltd to provide a lithological understanding of the area. Results are included in the First Annual Report for EL7871 Chester for the Year Ending 11 September 1996.

665000E 670000E 130° 40'E 675000E 680000E

EL 7871
Chester

7780000N

20° 05'S

7775000N

665000E 670000E 130° 40'E 675000E 680000E

N
W E
S

0 1km
SCALE 1:50,000

UTM Zone 52 (AGD66)

Area Relinquished 11/09/97

LAG Sample

CRC Sample

Ground Magnetic Survey Traverse

Normandy NFM Limited

NORTH FLINDERS EXPLORATION

EL 7871 - CHESTER

SURFICIAL SAMPLE LOCATION PLAN

30 OCT 98

FIGURE 3

g:\diagram\tancel\cheav001.dgn

9. EXPENDITURE INCURRED FOR THE REPORTING PERIOD

A summary of exploration expenditure for the three years of tenure is tabled below. A breakdown of costs for the third year of tenure is outlined in Table 5.

TABLE 4: Summary of Exploration Expenditure for EL7871

EL7871		Covenant ($)	Expenditure ($)
Year 1	12/9/95 - 11/9/96	30 000	57 682
Year 2	12/9/96 - 11/9/97	20 000	105 149
Year 3	12/9/97 - 11/9/98	20 000	12 360
		$70 000	**$175 191**

TABLE 5: Details of Exploration Expenditure for the Year to 11 September 1998

COST CENTRE	EL7871 TOTAL
Geologist (10 days @ $400/day)	4 000
Geophysicist (4 days @ $400/day)	1 600
Field Assistant (4 days @ $250/day)	1 000
Petrology (6 samples)	760
Adelaide Support Costs & Tanami Field Indirects*	5 000
TOTAL	**$12 360**
COVENANT	20 000

* Adelaide Support Costs includes the cost of computer data management, in-house drafting and general administration. Tanami Field Indirects includes the cost of maintaining field camps and equipment, etc., but excludes field personnel wages.

REFERENCE LIST / ANNUAL REPORT BIBLIOGRAPHY

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Hossfeld, P.S. 1940b. The Gold Deposits of The Granites-Tanami District, Central Australia. *Aer. Geol. Geophys. Surv. N.Aust., Northern Territory Report 43.*

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Longmire, R.A., and Adrichem, S.M. 1997. Second Annual Report for EL7871 (Chester) for the Year Ending 11 September 1997. North Flinders Mines Limited Report RAL9701.

Longmire, R.A., and Adrichem, S.M. 1997. Relinquishment Report for EL7871 (Chester) for the Period 12 September 1995 to 11 September 1997. Normandy FM Limited Report RAL9705.

APPENDIX 1 - SURVEY METHODOLOGY & REHABILITATION TECHNIQUES

1.1 GEOPHYSICAL SURVEYS

Ground Magnetics

All ground magnetic surveys are effected by North Flinders personnel.

Total Magnetic Intensity (TMI) readings are taken at 10m intervals (unless otherwise stated) using a G856 proton precession magnetometer and a pole height of 1.8m. Diurnal measurements are taken using a second magnetometer as a base station, with readings taken every 30 seconds. On completion of the survey, diurnal variations are removed from the data using the MAGPAC program.

Data is collected over the surveyed lines which are pegged every 100m and clearly annotated with the line number and location coordinates. Traverses are established using a Trimble Global Positioning System combined with a Racal differential GPS attachment.

Details particular to each survey are discussed in the body of this report. Line origins are estimated to be within +/-50m of the AMG co-ordinates listed.

1.2 LOCATION SURVEYS

Gridding

Grids are established by NFM Surveyors.

If the grid is located within one to two days traversing from an existing grid with first to third order control, the original grid is used to determine positioning. If the grid is isolated, single point GPS (Trimble Pathfinder) precision is adopted (+/-300m due to military and atmospheric errors).

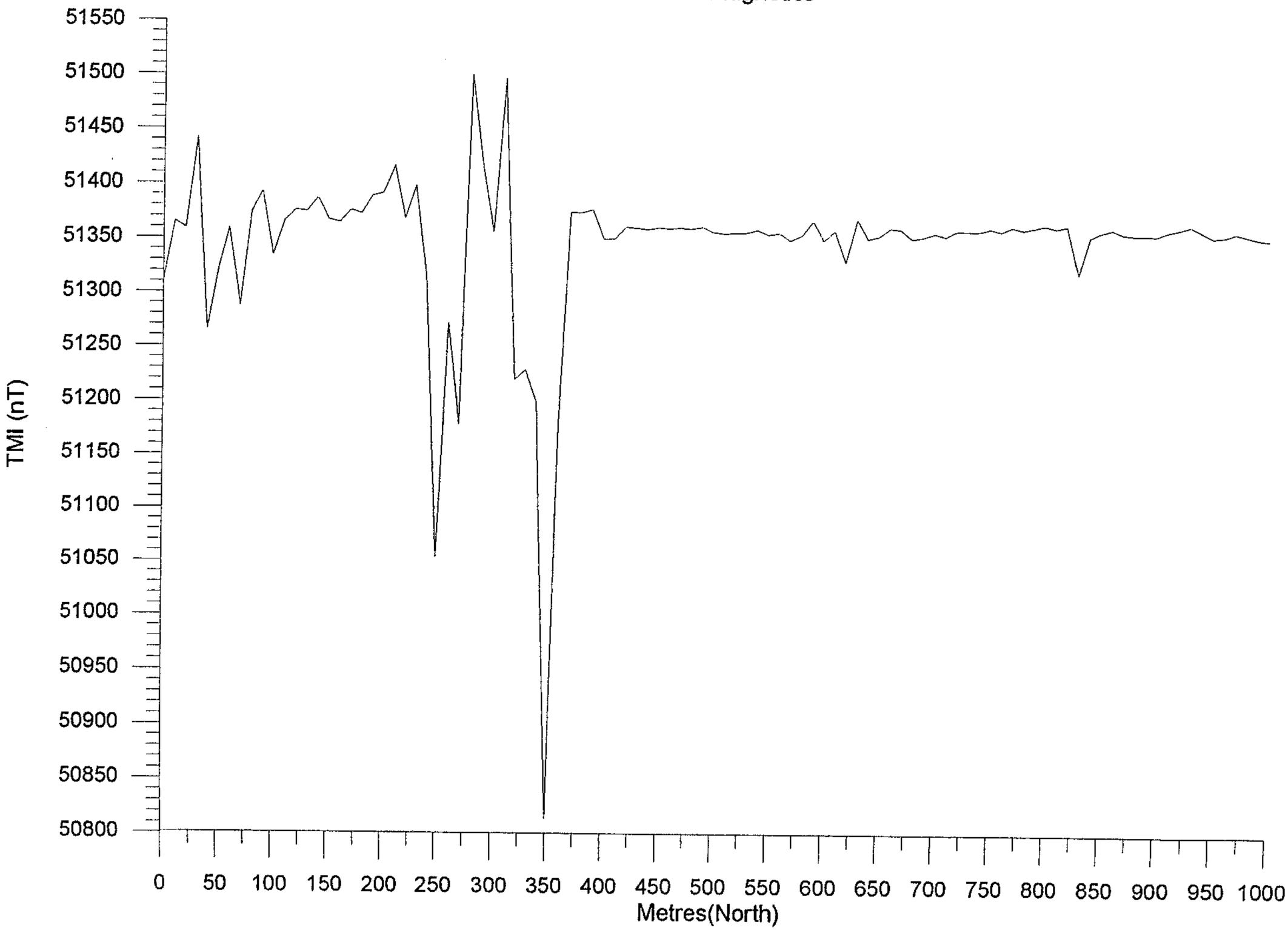
On occasion, a baseline is accurately surveyed in, enabling lines to be established by tape, compass and optical square.

1.3 DRILLHOLE REHABILITATION TECHNIQUES

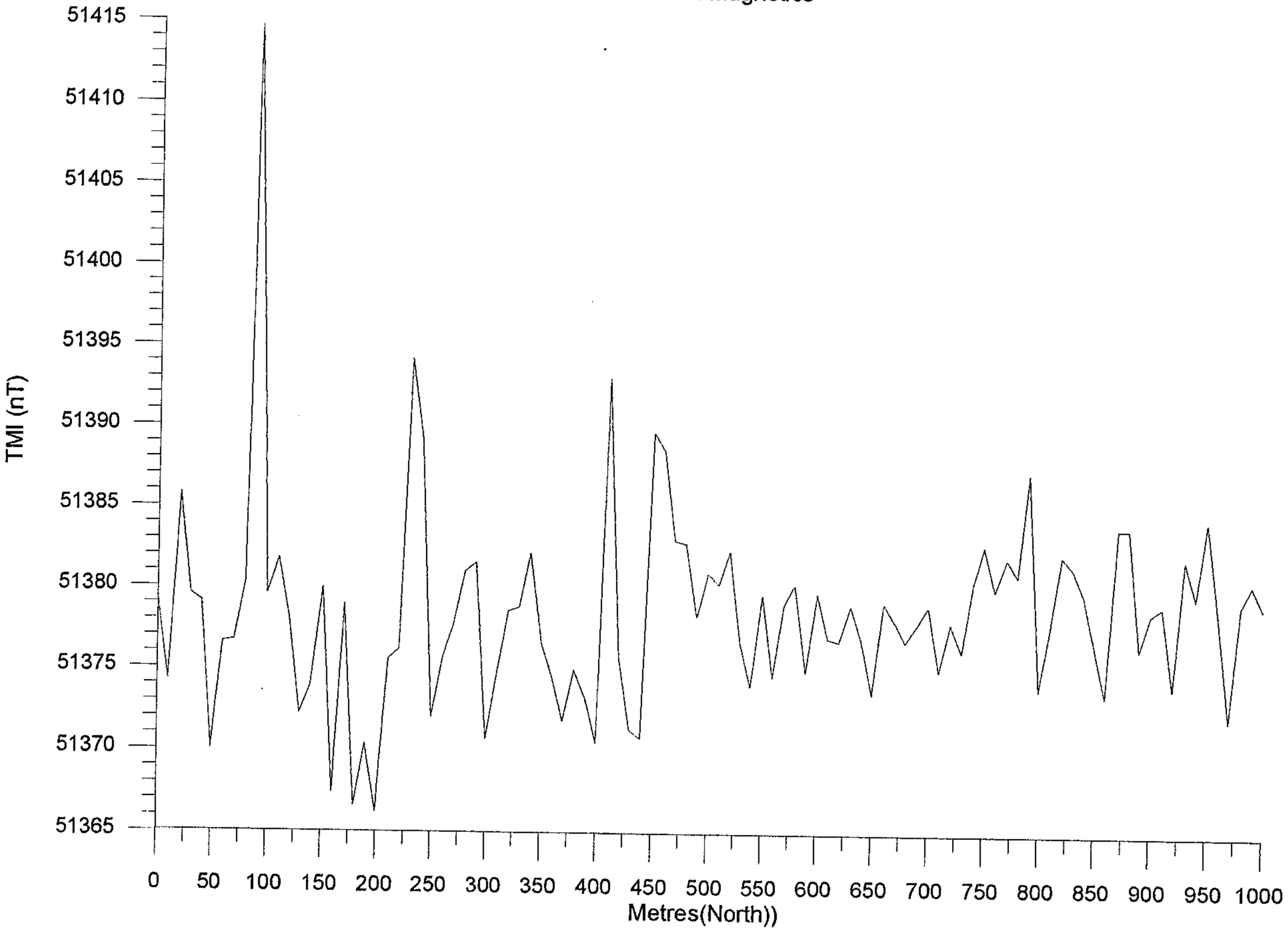
All RAB drillholes are rehabilitated on completion of drilling by inserting a plug approximately 1m below surface. The cavity is then backfilled and mounded. All rubbish is removed from the site.

APPENDIX 2 - GROUND MAGNETIC DATA (PROFILED)

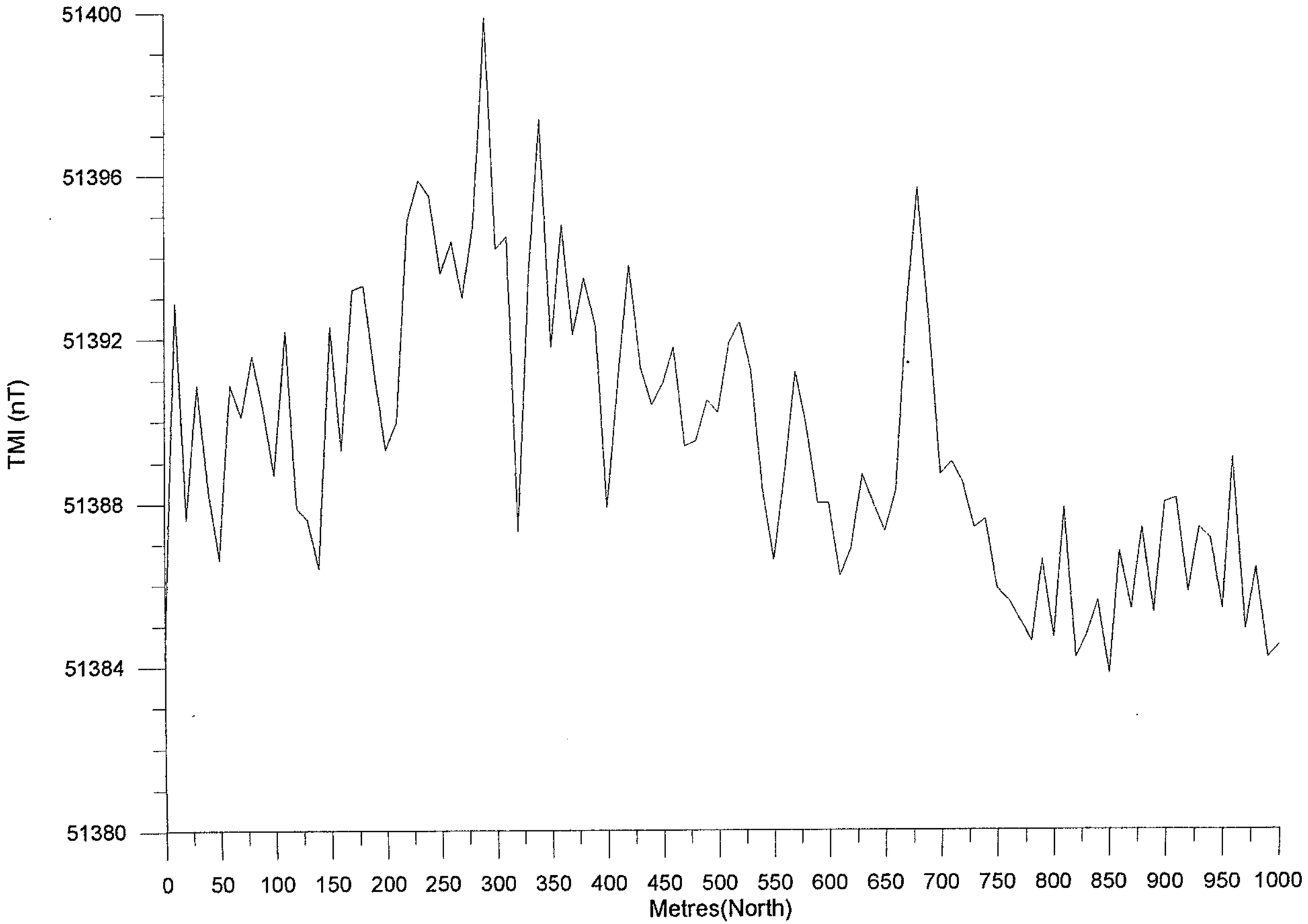
Chester : Line A, 8-10-97
Ground Magnetics



Chester : Line B, 8-10-97
Ground Magnetics



Chester : Line C, 8-10-97
Ground Magnetics



APPENDIX 3 - PETROLOGY SAMPLE DESCRIPTIONS

Report #	Author	Date	Work	Geo	Prospect					Notes	Central
Petrology #	Count	ID		Type	NFMSample #	From	To	Easting	Northing	Description	EL7871
Central EL7871 (Chester)											
M2397	**DM**	**25/11/97**	**TS**	**DQ**	**Chester (EL)**					***photos***	
P00645	1	CMRB024		DH	699041	36	39	673000	7775400	Oxidised silty carbonate sediment.	
P00646	2	CMRB024		DH	699042	39	42	673000	7775400	Weathered biotite schist (meta-pelite). Weathered biotite granodiorite.	
P00647	3	CMRB028		DH	699093	39	42	673000	7775800	Oxidised layered silty carbonate sediment.	
P7462	**PU**	**29/10/97**	**TS**	**CC**	**Chester (EL)**						
P04070	1	CMRB024		DH	699041	36	39	673000	7775400	Limonitised carbonate-rich sediment with very fine grainedsand-sized quartz, carbonate and mica fragments, claystonewith slumped silt to very fine-grained sand, and sandysiltstone with lenses or fragments of claystone. Unmetamorphosed sediments of uncertain age.	
P04071	2	CMRB024		DH	699042	39	42	673000	7775400	Weathered metasediments with clays after plagioclase, schistose biotite, quartz, muscovite, lenses of microcline and disseminated opaque oxide, also a weathered biotite granodiorite with poikilitic orthoclase.	
P04072	3	CMRB028		DH	699093	39	42	673000	7775800	Limonitised to carbonate-rich unmetamorphosed sediment with quartz, carbonate, rare plagioclase, quartz-muscovite schist and alkali felspar fragments, mostly to 0.1mm (silt and veryfine sand) rarely to 0.8mm (coarse sand).	