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SECOND
FINAL REPORT ON
EXPLORATION LICENCE 2375
MURRUMBATEMAN, NEW SOUTH WALES

BY

MINERAL MANAGEMENT & SECURITIES PTY. LTD.

N. SHEPPARD

T. NASHAR

JANUARY, 1986



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1. INTRODUCTION

Exploration licence (E.L.) 2375 was granted to Lincoln McClatchie and the Mineral Management and Securities Pty. Ltd. (MM & S) / Kennecott joint venture on 21st February, 1985.

The E.L. covers what appears to be a roof pendant of lutaceous, in part carbonate rich, sediments within a large body of quartz-biotite porphyry. At least one unit of the sediments has been metamorphosed to skarn. The old Caledonian and Edith May mines were established in this skarn to exploit a Au - Bi deposit.

The exploration was aimed at the discovery of bulk low grade gold mineralization within the skarn unit. It has taken the form of regional reconnaissance and rock chip sampling, detailed soil sampling, ground magnetics, two percussion drilling programmes for a total of 766.2 metres and 21.45 metres of diamond core drilling.

2. LOCATION

Exploration licence 2375 is situated immediately NE of the small township of Murrumbateman (see Figure 1). The licence is bounded by longitudes 149 01'E and 149 04'E and latitudes 34 56'S and 34 58'S and covers an area of approximately 18 square kilometres.

The Barton Highway passes through the SW corner of the licence and along with numerous farm tracks, provides excellent access to most of the E.L.

The land has been extensively cleared and pasture improved for both grazing (sheep and cattle) and farming (wheat and oats) purposes. The exception being a heavily timbered portion in the northeast corner of the licence. The topography consists of low, gently rolling hills and river flats.

3. REGIONAL GEOLOGY

The licence area is situated within the Cowra - Yass Synclinorial zone, which forms part of the Lachlan Fold Belt.

The rocks in the area belong to the Duoro Group of Middle to Late Silurian age. The Duoro Group consists of undifferentiated fine to coarse grained rhyolitic to dacitic tuffs, rhyolite, dacite, andesite, dellenite with interbedded limestone, sandstone and shale according to Felton (1974).

4. MINING HISTORY

Gold was probably discovered at the site of the Caledonian - Edith May mines in 1898 with the assaying of a ferruginous rock containing garnet giving 3.75 oz/t Au.

Individuals and small groups worked and tested the Caledonian - Edith May mines area between 1898 and 1939. Total production from the mines was 501 tonnes of ore producing 189oz of gold. Grades varied from 4 - 30.6 g/t.



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It appears there were at least three shafts, one or more being sunk to a depth of at least 30 metre. In addition to the gold grades, silver values varied from a trace to over 5oz/t, and bismuth also varied greatly, from zero to 15.3%.

5. PREVIOUS EXPLORATION

In 1974, Cominco (under A to E's 8995) explored the licence area as part of a base metal exploration programme. They completed a number of ground magnetic traverses over the area and outlined a magnetically disturbed zone 800 metres long and trending north-northwest. Weathered "bedrock" sampling was carried out along the magnetometer traverses. The samples were only analysed for base metals, the results were uninteresting.

At the Homestead Prospect in the NE part of the present E.L., Cominco drilled a diamond core hole (DDH HS 1) under an ironstone outcrop approximately 100 metres long, 10 metres wide and trending E - W. The metal grades were considered uneconomic.

In addition, Atlas Exploration (Australia) Ltd./Land Planning and Development (Mining) Pty. Ltd. (under E.L. 131) and Esso (under E.L. 559) held exploration title over very small parts of the present E.L., but neither looked in detail at the Caledonian - Edith May mines area.

6. CURRENT EXPLORATION

Exploration completed on E.L. 2375 by MM & S, since it was granted on the 20th February, 1985, includes reconnaissance rock chip sampling, soil sampling, geological mapping, percussion drilling, diamond core drilling and ground magnetics survey.

6.1 Reconnaissance rock chip sampling

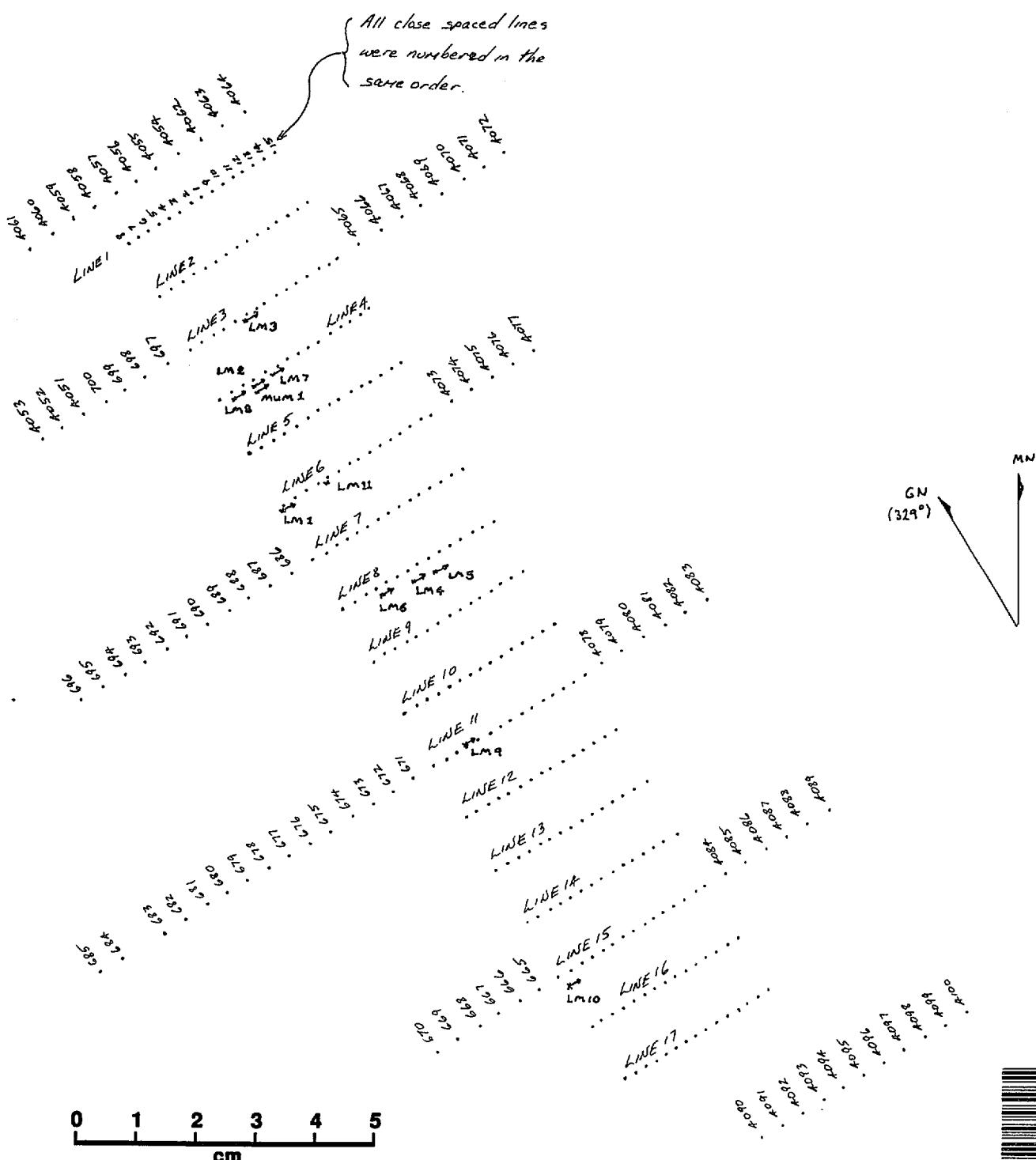
The first work completed on the licence was reconnaissance rock chip sampling of the rubble along the ridge between the Caledonian and Edith May mines. The samples (1417 - 1423) were anomalous for gold and the results are listed in Appendix 1.

6.2 Soil sampling

This initial reconnaissance was followed by a soil sampling programme consisting of seventeen lines, each 50 metres apart, along the main Caledonian - Edith May ridge (see Figure 2). Samples were taken every 10m, 15 to every line, giving a total of 255 samples. An effort was made to sample the C horizon but in many cases it was only practicable to sample B horizon material. The samples were not sieved, but treated as for a rock sample and then analysed for Au. Sample locations are shown on Figure 2. The assay results are listed in Appendix 2 and plotted on Figure 3.



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LEGEND

- LM1 Drillhole (percussion)
- MUM1 Drillhole (diamond)
- Soil sample location
- . K061 Sample number

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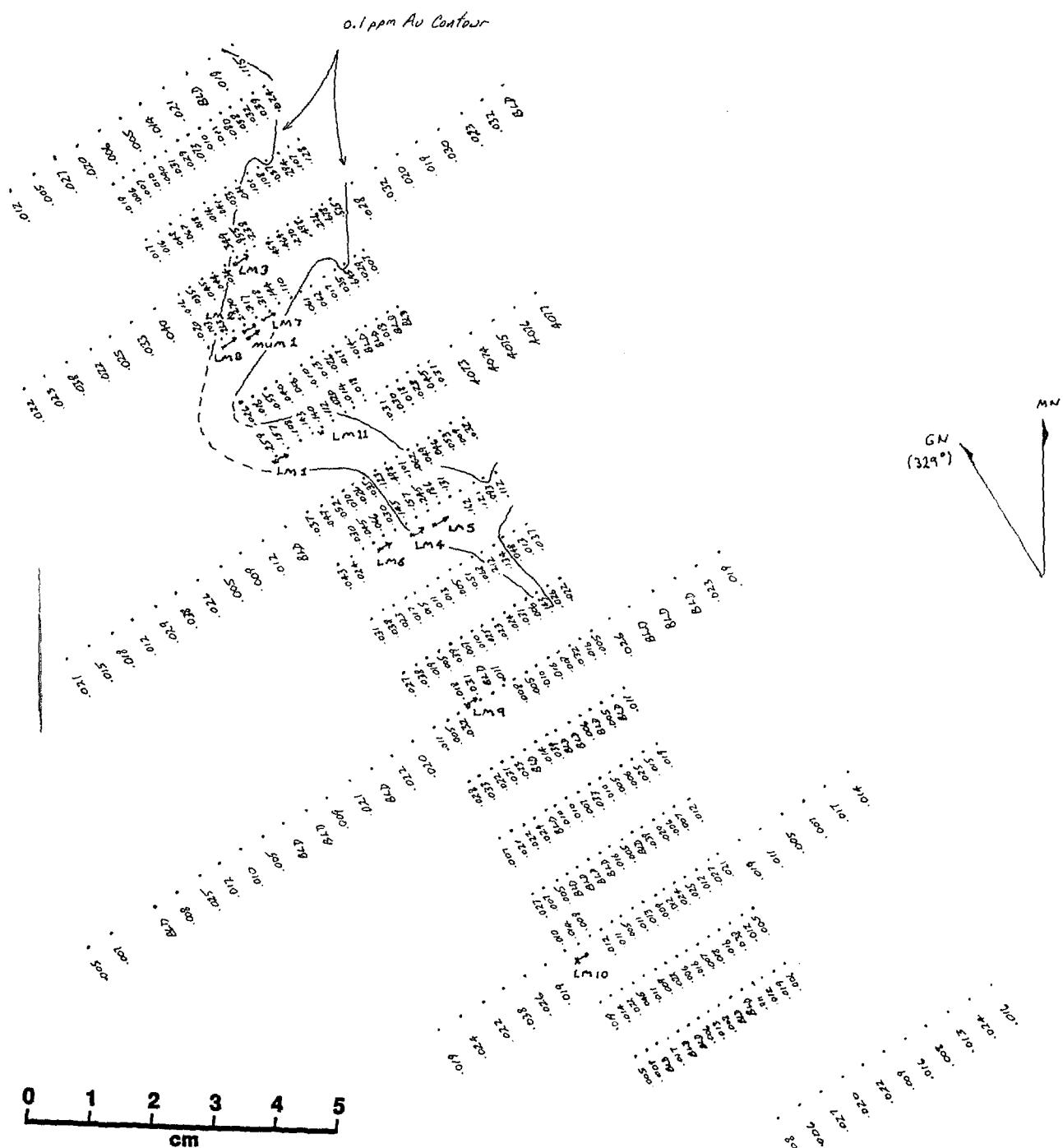
E.L. 2375
MURRUMBATGEMAN
SOIL SAMPLE LOCATIONS

8 / 8 / 85	FIGURE 2
------------	----------



D001054310

65 15 22 4



LEGEND

- LM7 Drillhole (percussion)
- MU1 Drillhole (diamond)
- Soil sample location
- · · Au (ppm)

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E.L. 2375
MURRUMBATEMAN
SOIL SAMPLE RESULTS

8 / 8 / 85

FIGURE 3

A second soil programme was completed after the drilling of twelve shallow holes. This programme was designed to expand the initial soil sampling grid. A total of 85 samples were taken. Sample locations are shown on Figure 2. The samples were collected and treated by the same methods as in the first programme. Assay results are listed in Appendix 2 and plotted on Figure 3.

6.3 Geological mapping

A major portion of the E.L. was geologically mapped at 1:5000 scale, using an enlarged airphoto.

The geology as shown on Plan 1, reveals a sedimentary sequence in the central southern part of the E.L. surrounded by what appears to be an intrusive, quartz-biotite porphyry.

The first drilling programme showed that at least one unit of the sedimentary sequence has been metamorphosed to a garnet skarn. However, the ground magnetics and further percussion drilling suggest that the unit consists of a hornfels with skarn pockets in the south, with the garnet skarn only becoming dominant at the northern end of the main ridge. All the old workings i.e. Caledonian - Edith May, are located within the skarn unit at the northern end of the ridge (refer to Plan 2).

Drilling and outcrop pattern suggest the sedimentary sequence dips gently to the west. To the east, the sequence consists of indurated "marly" siltstone, which may be stratigraphically equivalent to the garnet skarn.

To the north, outcrop diminishes, but the sedimentary rocks do continue in that direction. There appears to be coarsening from siltstone, often ferruginous, in the east to fine to medium grained sandstone, often indurated, in the west.

To the south, the skarn unit is terminated by an east - west trending fault. The sedimentary sequence however, still continues south of the fault.

At the "Homestead Prospect" (after Cominco Gs 1974/307) in the NE part of the E.L. near Murrumbateman Creek, a haematite - limonite, ironstone was mapped. It trends E-W and distinctively protrudes from the low lying creek flats.

Twenty nine rock chip samples (3525 - 3526, 3530 - 3545, 4140 - 4149, 4351 - 4352) were taken during the mapping programme. Sample locations are shown on Plan 1 and assay results are listed in Appendix 1. Some weakly anomalous gold values were scattered along the eastern ridge.

The two highest gold assay results were:-

Sample No.	g/t Au
3536	0.50
3543	0.43



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6.4 Percussion Drilling

An initial programme of eleven shallow percussion drillholes for a total of 430.2 metres was completed on the Caledonian - Edith May grid. The aim of the programme was to test the anomalous zone, + 0.1 g/t Au outlined by the soil sampling. The shape of the 0.1 g/t Au contour in relation to the topography indicated the gold - anomalous unit dips shallowly to the west.

The results of the drilling are on drill logs in Appendix 3 and on cross sections, see Plans 3 to 9.

All drillholes except LM10, intersected anomalous gold in a garnet skarn zone. The best intersection was in drillhole LM6 which produced an 8 metre zone of 2.55 g/t Au. A summary of other significant intersections is listed below:-

Drillhole	Depth	Length (m)	Au (g/t)
LM2	0 - 36	36	0.94
LM5	8 - 18	10	0.92
LM6	16 - 24	8	2.55
LM7	1 - 16	16	1.20
LM11	4 - 12	8	0.91

The drilling has shown that significant thicknesses of anomalous gold (+ 0.5 g/t) do exist i.e. LM2 (36m). Consequently, the possibility still existed for a large, near horizontal gold ore body, amenable to bulk, low grade mining.

As a result, a second percussion drilling programme was designed to test the down dip potential and areal extent of the gold - anomalous skarn unit. The programme consisted of eleven vertical percussion drillholes for a total meterage of 336 metres.

The results of the drilling are on drill logs in Appendix 3 and on cross section, see Plans 3 to 9.

This programme downgraded the prospect considerably as all holes failed to intersect the skarn zone. Drillholes LM12, 13, 14 were designed to test the down dip potential of the gold - anomalous unit. However, they only intersected minor siltstone sequences before encountering the intrusive quartz biotite porphyry.

Any chance of the prospective unit extending to the north was eliminated when drillholes LM 15, LM 16 and LM 17 only intersected siltstone, claystone and sandstone. While drillholes to the east and south of previous drilling also failed to intersect the skarn unit i.e. LM 18, 19 and 22.

Consequently the second phase of drilling has shown that the flat to shallow westerly dipping skarn unit was restricted to the main ridge, the topographic high.

A further two drillholes, LM 20 and LM 21, were drilled on a topographic high to the east to determine whether a remnant skarn unit remains. Drillhole LM 20, on the southern side of the fault, did not intersect any skarn material. However, LM 21 intersected some very limonitic material, possibly skarn, at the top of the hole. Anomalous gold values were recorded in this interval. The possibility still exists for a small zone of skarn north of the fault but gold grades appear to be sub-economic, see Plan 9.

6.5 Diamond Core Drilling

Problems arose during the percussion drilling programme due to most holes encountering water. The result of this was that most of the fine material was lost in the sampling process and the sample size was greatly reduced due to poor circulation.

Drillhole LM 1 sampling is particularly suspect as this was the first hole, drilling and sampling methods were not yet adjusted to suit the condition. Subsequent drilling and sampling still encountered difficulties due to the water but contamination was minimal.

To check the percussion sampling methods, a single diamond core hole, MUM 1, was drilled alongside LM 2, see Appendix 4. Table 1 shows the comparison of assay results from the percussion hole, LM 2 and the diamond core hole, MUM 1. It is immediately apparent that the correlation of two metre assays is extremely poor.

However, if averages are taken for the first 20 metres of each of the two holes, the correlation is quite good. The first 20 metres of LM 2 averages 0.87 g/t Au and that of MUM 1 averages 0.92 g/t Au.

6.6 Ground Magnetics Survey

Prior to the second percussion drilling programme, a ground magnetics survey was completed using a single Scintrex Proton magnetometer. The survey consisted of six lines 200 metres apart along the main ridge and two lines 200m apart were completed over the eastern ridge. Readings were taken at 20 metre intervals along the grid lines, except over a magnetically disturbed area on the main ridge where readings were taken every 10 metres.

The results of this survey and the location of the grid lines are shown on Plans 10 to 14.

The magnetics confirms the results of the drilling which confine the skarn zone to the Caledonian - Edith May ridge area. The strongest magnetic response also correlates with the skarn zone (Sk), see Plan 2, defined by the drilling. The magnetic response over the rest of the skarn unit is erratic, possibly confirming the fact that the skarn occurs as pockets in the hornfels.

TABLE 1
DRILL ASSAY RESULT COMPARISON

GS 1925 234

LM2				MUM1			COMMENTS
DEPTH (m)	Au (ppm)	REPEATS	AVERAGE	DEPTH (m)	RECOVERY (m)	Au (ppm)	
0-2	0.64			0-2	2.00	1.02	
2-4	1.19			2-4	1.63	0.99	
4-6	0.72			4-6	1.70	0.26	
6-8	1.67			6-8	1.68	0.24	
8-10	1.15			8-10	1.84	0.49	
10-12	0.52			10-12	0.23	3.76	
12-14	5.81	1.50, 1.28, 1.02	1.26	12-14	1.87	0.82	
14-16	0.52			14-16	1.60	0.18	
16-18	0.75			16-18	1.82	0.54	
18-20	0.28			18-20	0.35	0.90	
20-23	1.45			20-21.45	0.80	0.12	

7. METALLURGY

Three percussion drill samples LM2 6-8m, LM3 10-12m and LM6 20-22m were despatched to Warmans International Ltd for preliminary metallurgical testing.

The LM2 and LM3 samples were of oxidised ore. The LM6 sample was of fresh ore.

The samples were tested for gold extraction using cyanide leaching. Results were very good with 84 - 97% gold being leached after 6 hours. However, the oxidised samples exhibited an extremely high lime consumption rate. Appendix 5 contains Warmans full report.

8. CONCLUSIONS

Exploration by MM & S, on EL2375, has included geological mapping, rock chip sampling, percussion drilling, diamond core drilling and ground magnetics. This work has delineated a skarn / hornfels unit with anomalous gold values, approximately 600 metres long and 150 metres wide.

However, the skarn is very irregular in nature and only occurs in pockets throughout most of the unit. The exception being the north west corner of the unit which is mostly garnet skarn with only minor hornfels. The old Caledonian and Edith May workings are confined to this skarn zone and the best assay results from the drilling also came from this pocket.

This skarn zone is shown on Plan 2 (Sk) and is approximately 350 metres long and 80 metres wide.

Although gold grades of up to 2.5 g/t Au over widths of 8 metres (LM 6) were obtained within this skarn unit, the average grade is between 0.5 g/t Au and 1.0 g/t Au. These values although anomalous are sub-economic.

In addition, the second phase of drilling found that the skarn unit was restricted to the topographic highs greatly reducing the size potential of the orebody.

Consequently, the possibility of the original target of a large, near horizontal gold ore body amenable to bulk low grade mining practices has been eliminated.

9. RECOMMENDATIONS

The exploration completed by MM & S on behalf of the MM & S / Kennecott joint venture, has eliminated the possibility of a large, low grade, bulk mineable reserve. However, potential still exists for a small easily mineable shallow reserve in the vicinity of the old Caledonian - Edith May workings.

The MM & S/Kennecott joint venture has no further interest in the licence area and intend to withdraw from the property. The title will not be relinquished, but transferred to Lincoln McClatchie.

10. EXPENDITURE

Total expenditure on Exploration Licence 2375 by the Mineral Management/Kennecott (MKJV) and Lincoln McClatchie joint venture to December, 1985 is as follows:-

Geology	\$ 6,007.74
Geochemistry	7,729.25
Drilling	40,192.93
Metallurgy	1,246.00
Accommodation & Meals	3,477.02
Drafting & Surveying	452.32
Administration & Management	<u>2,676.79</u>
TOTAL	<u>\$67,422.98</u>

11. REFERENCES

- MR 2284 Miscellaneous Reports, Caledonian and Edith May Mines, Murrumbateman
- GS 1942/084 Murrumbateman Bismuth Deposits
(J.W. Whiting and R.G. Whalan)
- GS 1974/307 Drilling Aid, A to E's 8995 and 9701, Cootamundra;
Homestead and Long Reign Prospects, Murrumbateman.
(Cominco Exploration Pty. Ltd.)
- GS 1982/243 Exploration Reports, E.L. 1768, Murrumbateman Area
(Teck Explorations Ltd.)
- GS 1983/314 Final Report, E.L. 1768, Murrumbateman Area
(Teck Explorations Ltd.)
- GS 1985/224 Six Monthly Report on Exploration Licence 2375,
Murrumbateman, N.S.W.
(T. Nashar, Mineral Management & Securities
Pty. Ltd.)
- FELTON, E.A. 1974, Goulburn 1:250,000 Metallogenic Map

APPENDIX 1

Rock Chip Sample Data Sheets



D001054330

ROCK CHIP SAMPLE DATA

PROSPECT

MORRUMBATIMAN

Date

page 1 of 3

NUMBER	LOCATION			DESCRIPTION mineralogy / alteration	GS 1985	qtz	ox	ASSAYS (ppm)				
	sheet.	co-ordinates	length					Au	Ag	As	Cu	Pb
3525			15m grid north of LM-10	siltc., ferrug., kaolin, volcanic? c. boxwork (float)	.	.	.	0.04	0.30	183	64	205
3526		" "	" " "	" " " " (float)		BLD		0.41	212	87	108	38
3530			80m grid SW of LM-4	gossanous, iron stained, kaolin., diated hornfels/sed.				0.06				
3531				Float - ferrug qtz porph (flow bedded??) c. lithic frags (siltstone) to 1.5 cm.				0.17				
3532				Float - qtz porph, diated?? in pt.				BLD				
3533				White, qtz porph?, kaol in pt, siltc in pt, pyritic in pt, diated?? in pt.				BLD				
3534				Float - qtz pyritic siltaceous rock (qtz porph - indurated sed?)				0.07				
3535				Float - has gossan!				BLD				
3536				Float - weath. qtz feld biot porph & some qtz veins to 3cm, in pt very & has qtz				0.50				
3537				3.kaeros rock in pt, (diated siltstone) diation due to qtz veins - gossany & weath in pt				0.06				
3538				Indurated siltstone interbedded c coarse sst & fossil debris				0.04				
3539				qtz indurated siltstone c carbonate filled vugs.				0.04				
3540				Diated siltstone? c qtz-infill.				0.08				
3541				gossany' siltstone c massive boxwork along bedding & c minor qtz veins				BLD				
3542				qtz med f-m g. qtz biot porph, kaol & seric? in pt.				0.09				
3543				qtz med diated siltstone c has, cly & finer qtz fill, some has after py				0.43				
3544				Ferrug siltstone c has after py, siltc in pt, seric in pt c has chl vugs				0.05				

ROCK CHIP SAMPLE DATA.

PROSPECT

MURRAYBATEMAN

Date

page 2 of 3

NUMBER	LOCATION			DESCRIPTION mineralogy / alteration	GS 1985 27 Qtz ox	ASSAYS (g/m)					
	sheet.	co-ordinates	length			Au	Ag	As	Cu	Pb	
3545			"Homestead prospect"	Ironstone "gossan?" - iron, haem, Mn, - minor thin streakwork, vugly + st + limy fill					0.06		
1417						1.30	6.38	100	BLD	70	528
1418						0.29	1.61	1507	2283	2163	636
1419						2.31	15.8	4307	53	4610	45
1420						1.38	4.02	1185	36	832	55
1421						1.12	0.16	68	15	105	133
1422						BLD	0.89	37	BLD	138	274
1423						BLD	1.37	50	7	29	85
4140			"Eastern Ridge"	Gossanous in part, silicified material with quartz.		0.10					
4141			" "	Grey siliceous rock, Qtz veined + Fe stained		BLD					
4142			" "	As for 4140		BLD					
4143			" "	Quartz porphyry, strongly Fe stained, with quartz veining		BLD					
4144			" "	Quartz with limonite after pyrite.		BLD					
4145			" "	Quartz porphyry minor Qtz veining + limonite.		BLD					
4146			" "	Quartz porphyry grey in colour, silicified.		BLD					
4147			" "	{ Grey indurated, brecciated siltstone, with (coarse phases (marl?), vugly + Qtz phenocrysts		BLD					

ROCK CHIP SAMPLE DATA.

Prospect MURRUMBATEMAN

Date _____

page 3 of 3

NUMBER	LOCATION			DESCRIPTION mineralogy / alteration.	ASSAYS		
	sheet.	co-ordinates.	length		gtz	ox	Au
4148				"EASTERN RIDGE"	Hs	for	4147
4149				" " "	Disseminated galena + pyrite in a quartz var.		BLD
4351				Yass River road cutting	Rock chip - 10 metres of quartz porphy + siltstone		BLD
4352				" " " "	Rock chip - 8 metres as above		BLD
* BLD = BELOW LEVEL OF				DETECTION (0.04 ppm)			

GS1925 92A

APPENDIX 2

Soil Sampling Assay Results



D001054340

FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)
 15 WHITING ST., ARTARMON, N.S.W., 2064
 POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064
 Telephone: 439 5999

GS 1985

REPORT OF ANALYSIS

CLIENT	DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE NO.
Mineral Management & Securities, 5th Floor, 58 Pitt Street, SDYNEY.	2.11.84	13.11.84	11020
<hr/>			
Sample No.	Au		
Line 1-01	0.073		
02	0.029		
03	0.031		
04	0.040		
05	0.010		
06	0.007		
07	0.006		
08	0.019		
09	0.010		
10	0.011		
11	0.080		
12	0.058		
13	0.032		
14	0.039		
15	0.024		
Line 2-01	0.033		
02	0.041		
03	0.014		
04	0.018		
05	0.067		
06	0.048		
07	0.016		
08	0.017		
09	0.041		
10	0.101		
Limit of Detection	0.005 ppm		
Analytical Method	PML		

Sheet 11020/1

Signatory



DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)

15 WHITING ST., ARTARMON, N.S.W., 2064

POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064

Telephone: 439 5999

G.J. 1984/10/14

REPORT OF ANALYSIS

CLIENT	DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE NO.
--------	---------------	---------------	-------------------

Mineral Management & Securities, 5th Floor, 58 Pitt Street, SYDNEY.	2.11.84	13.11.84	11020
--	---------	----------	-------

Sample No.	Au
------------	----

Line 2-11	0.108
-----------	-------

12	0.087
----	-------

13	0.284
----	-------

14	0.107
----	-------

15	0.128
----	-------

Line 3-01	0.238
-----------	-------

02	0.955
----	-------

03	0.349
----	-------

04	0.034
----	-------

05	0.044
----	-------

06	0.045
----	-------

07	0.035
----	-------

08	0.016
----	-------

09	0.459
----	-------

10	0.469
----	-------

11	0.270
----	-------

12	0.498
----	-------

13	0.226
----	-------

14	0.678
----	-------

15	0.525
----	-------

Line 4-01	0.110
-----------	-------

02	0.144
----	-------

03	0.318
----	-------

04	0.317
----	-------

05	2.270
----	-------

06	0.263
----	-------

07	0.103
----	-------

08	0.020
----	-------

Limit of Detection 0.005 ppm

Analytical Method PM1

Sheet 11020/2

Signatory



FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)

15 WHITING ST., ARTARMON, N.S.W., 2064

POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064

Telephone: 439 5999

GS 19

REPORT OF ANALYSIS

CLIENT

Mineral Management & Securities,
5th Floor, 58 Pitt Street,
SYDNEY.

DATE RECEIVED**DATE REPRODUCED****SAMPLE ADVICE NO.****Sample No.****Au**

Line 4-09 0.061

10 0.062

11 0.017

12 0.035

13 0.645

14 0.029

15 0.007

Line 5-01 0.026

02 0.013

03 0.010

04 0.006

05 0.040

06 0.055

07 0.016

08 0.026

09 0.017

10 0.014

11 Bld

12 Bld

13 0.013

14 Bld

15 Bld

Line 6-01 0.014

02 0.020

03 0.112

04 0.140

05 0.143

Limit of Detection 0.005 *ppm*

Analytical Method PMI *PT*

Sheet 11020/3

Signatory

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DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)

15 WHITING ST., ARTARMON, N.S.W., 2064

POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064

Telephone: 439 5999

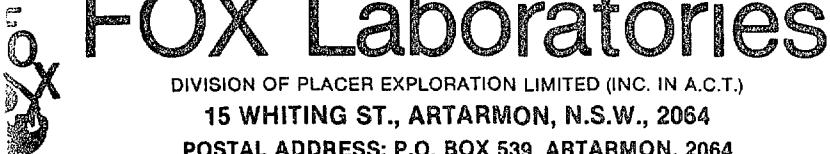
G. 19/11/84

REPORT OF ANALYSIS

CLIENT		DATE RECEIVED	DATE REPORTED	SAMPLE ADVISE NO.	S
Mineral Management & Securities, 5th Floor, 58 Pitt Street, SYDNEY.		2.11.84	13.11.84	11020	
Sample No.	Au				
Line 6-06	0.108				
07	0.157				
08	0.259				
09	0.018				
10	0.031				
11	0.030				
12	0.018				
13	0.028				
14	0.045				
15	0.031				
Line 7-01	0.498				
02	0.123				
03	0.035				
04	0.026				
05	0.070				
06	0.052				
07	0.047				
08	0.037				
09	0.101				
10	0.062				
11	0.049				
12	0.046				
13	0.053				
14	0.009				
15	0.032				
Limit of Detection	0.005 ppm				
Analytical Method	PMI				

Sheet 11020/4

Signatory



FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)

15 WHITING ST., ARTARMON, N.S.W., 2064

POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064

Telephone: 439 5999

GS 10/10/24

REPORT OF ANALYSIS

CLIENT	DATE RECEIVED	DATE REPORTED	SAMPLE NUMBER
--------	---------------	---------------	---------------

Mineral Management & Securities, 5th Floor, 58 Pitt Street, SYDNEY.	2.11.84	3.11.84	11020
---	---------	---------	-------

Sample No.	Au
Line 8-01	0.157
02	0.145
03	0.030
04	0.066
05	0.045
06	0.030
07	0.024
08	0.043
09	0.295
10	0.186
11	0.131
12	0.162
13	0.121
14	0.093
15	0.112
Line 9-1	0.005
02	0.013
03	0.011
04	0.015
05	0.017
06	0.023
07	0.038
08	0.031
09	0.051
10	0.068
11	0.212
12	0.134
Limit of Detection	0.005
Analytical Method	PGL

Sheet 11020/5

Signatory

FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)
 15 WHITING ST., ARTARMON, N.S.W., 2064
 POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064
 Telephone: 439 5999

GPO BOX 3034

REPORT OF ANALYSIS

CLIENT	DATE RECEIVED	DATE REPORTED	SAMPLE NUMBER
Mineral Management & Securities, 5th Floor, 58 Pitt Street, SYDNEY.	2.11.84	10.11.84	11020

Sample No.	Au
Line 9-13	0.048
0 14	0.013
15	0.037
Line 10-01	0.025
02	0.010
03	0.007
04	0.039
05	0.005
06	0.019
07	0.038
08	0.027
09	0.023
10	0.024
11	0.031
12	0.006
13	0.143
14	0.026
15	0.022
Line 11-01	0.008
02	0.011
03	Bld
04	0.031
05	0.018
06	0.032
07	0.005
08	0.011
09	0.005
10	0.010
Limit of Detection	0.005 / / ~
Analytical Method	PML
Sheet 11020/6	

Signatory





FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)

15 WHITING ST., ARTARMON, N.S.W., 2064

POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064

Telephone: 439 5999

6319

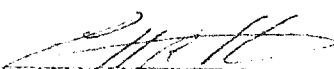
REPORT OF ANALYSIS

CLIENT	DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE NO.	SAP
Mineral Management & Securities, 5th Floor, 58 Pitt Street, SYDNEY.	2.11.84	13.11.84	11020	Sc

Sample No.	Au
Line 11-11	0.016
12	0.007
13	0.032
14	0.016
15	0.005
Line 12-01	0.039
02	0.014
03	Bld
04	0.023
05	0.031
06	0.022
07	0.033
08	0.028
09	Bld
10	Bld
11	0.006
12	Bld
13	0.005
14	Bld
15	0.011
Line 13-01	0.007
02	0.010
03	0.010
04	Bld
05	0.029
06	0.022
07	0.021
08	0.007
09	0.033
Limit of Detection	0.005 /P
Analytical Method	PM1

Set 11020/7

Laboratory



FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)

15 WHITING ST., ARTARMON, N.S.W., 2064

POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064

Telephone: 439 5999

GS 14

REPORT OF ANALYSIS

CLIENT	DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE NO.
--------	---------------	---------------	-------------------

Mineral Management & Securities, 5th Floor, 58 Pitt Street, SYDNEY.	2.11.84	13.11.84	11020
---	---------	----------	-------

Sample No.	Au
------------	----

Line 13-10	0.010
------------	-------

11	0.005
----	-------

12	0.006
----	-------

13	0.025
----	-------

14	0.015
----	-------

15	0.019
----	-------

Line 14-01	0.016
------------	-------

02	Bld
----	-----

03	Bld
----	-----

04	Bld
----	-----

05	Bld
----	-----

06	0.005
----	-------

07	0.007
----	-------

08	0.027
----	-------

09	0.005
----	-------

10	Bld
----	-----

11	0.039
----	-------

12	0.020
----	-------

13	0.006
----	-------

14	0.007
----	-------

15	0.012
----	-------

Line 15-1	0.013
-----------	-------

02	0.011
----	-------

03	0.005
----	-------

04	0.011
----	-------

05	0.012
----	-------

Limit of Detection	0.005 ppm
--------------------	-----------

Analytical Method	PML
-------------------	-----

Sheet 11020/8

Signatory



DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)
15 WHITING ST., ARTARMON, N.S.W., 2064
POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064
Telephone: 439 5999

GC 1985 224

REPORT OF ANALYSIS

CLIENT	DATE RECEIVED	TESTED ON	SAMPLE REFERENCE NO.
Mineral Management & Securities, 5th floor, 58 Pitt Street, SYDNEY.	2.11.84	3.11.84	11020

Sample No.	Au
Line 15-06	0.008
07	0.014
08	0.010
09	0.009
10	0.012
11	0.024
12	0.025
13	0.012
14	0.027
15	0.021
Line 16-01	0.006
02	0.022
03	0.009
04	0.011
05	0.045
06	0.022
07	0.014
08	0.019
09	0.016
10	0.007
11	0.018
12	0.016
13	0.038
14	0.012
15	0.005
Line 17-01	0.013
02	0.006
03	Bld
Limit of Detection	0.005ppm
Analytical Method	PGL
Sheet 11020/9	
Signatory	

FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)
15 WHITING ST., ARTARMON, N.S.W., 2064
POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064
Telephone: 439 5999

GST 93/3224

REPORT OF ANALYSIS

CLIENT	DATE RECEIVED	TEST PROGRAM	SAMPLE NUMBER
--------	---------------	--------------	---------------

Mineral Management & Securities, 5th Floor, 58 Pitt Street, SYDNEY.	2.11.84	3.11.84	11020
---	---------	---------	-------

Sample No.	Au
------------	----

Line 17--4	Bld
05	0.017
06	Bld
07	0.009
08	0.005
09	0.008
10	Bld
11	Bld
12	0.011
13	0.012
14	0.019
15	0.006

Limit of Detection 0.005 ppm

Analytical Method PNL

Sheet 110/0/10

Signatory

FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)

15 WHITING ST., ARTARMON, N.S.W., 2064

POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064

Telephone: 438 5999

REPORT OF ANALYSIS

MINERAL MANAGEMENT & SECURITIES,
5TH FLOOR,
58 PITT STREET,
SYDNEY.

ADVICE 11040, JOB NO. 8508012

SAMPLE NO.	AU
665	0.019
666	0.026
667	0.038
668	0.022
669	0.024
670	0.019
671	0.020
672	0.022
673	BLD
674	0.021
675	0.009
676	BLD
677	BLD
678	0.005
679	0.010
680	0.012
681	0.025
682	0.008
683	BLD
684	0.007
685	0.005
686	BLD
687	0.012
688	0.009
689	0.005
690	0.026
691	0.038
692	0.029
693	0.012
694	0.018
695	0.015
696	0.021
697	0.040
698	0.033
699	0.025
700	0.022
DETECTION LIMIT	0.005PPM
ANALYTICAL METHOD	PM2

SIGNATORY

Gwen Farrell

8508012/2

FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)

15 WHITING ST., ARTARMON, N.S.W., 2064

POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064

Telephone: 439 5999

GS 1985 224

REPORT OF ANALYSIS

MINERAL MANAGEMENT & SECURITIES,
5TH FLOOR
58 PITT STREET,
SYDNEY.

ADVICE 11040, JOB NO. 8508012

SAMPLE NO. AU

4051	0.038
4052	0.023
4053	0.022
4054	0.021
4055	0.014
4056	0.005
4057	0.006
4058	0.020
4059	0.027
4060	0.005
4061	0.012
4062	BLD
4063	0.019
4064	0.115
4065	0.028
4066	0.032
4067	0.020
4068	0.019
4069	0.030
4070	0.023
4071	0.032
4072	BLD
4073	0.034
4074	0.005
4075	0.013
4076	0.015
4077	0.022
4078	0.026
4079	BLD
4080	BLD
4081	BLD
4082	0.023
4083	0.019
4084	0.019
4085	0.011
4086	0.005
4087	0.007
4088	0.017
DETECTION LIMIT	0.005PPM
ANALYTICAL METHOD	FM2

SIGNATORY

Brian Farrell

8508012/3

FOX Laboratories

DIVISION OF PLACER EXPLORATION LIMITED (INC. IN A.C.T.)

15 WHITING ST., ARTARMON, N.S.W., 2064

POSTAL ADDRESS: P.O. BOX 539, ARTARMON, 2064

Telephone: 439 5999

GS 1985 224

REPORT OF ANALYSIS

MINERAL MANAGEMENT & SECURITIES,
5TH FLOOR,
58 PITT STREET,
SYDNEY.

ADVICE 11/1040, JOB NO. 8508012

SAMPLE NO.	AU
4089	0.019
4090	0.008
4091	0.006
4092	0.027
4093	0.020
4094	0.022
4095	0.009
4096	0.016
4097	0.008
4098	0.013
4099	0.024
4100	0.016
DETECTION LIMIT	0.005PPM
ANALYTICAL METHOD	PM2

SIGNATORY

Gwen Powell

8508012/4

GS 1986 224

APPENDIX 3

Percussion Drillhole Logs
and Assay Results



D001054350

GC 19

HOLE.

LM 1

PAGE

1 of

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E.L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation -60° , 054° mag.

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No 1M-1

-60° 054° mag 0-49 6 1/4 turn No casing used Water injection @ 25m.	FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	PANED MINERALIZATION	SAMPLE No	Au (ppm)
0-3	wh.			30cm rd-bn sandy cly soil, wh sandy clystne & s. minor lat chips	GS 1985	224	BLD
3-6				cm-wh sandy cly			BLD
6-8				wh sandy clystne & minor gr. hornfels & tr lat chips			BLD
8-10				dk gr-bk hornfels, lim ctd & lat chips			BLD
10-12				-----	Tro py? tail		0.04
12-14				-----	garnet		0.05
14-16				olive gr. ststone & tr bright gr. cly & minor lat chips	---		0.31
16-18				lim ctd ststone?	---		0.17
18-20				bry cly & lt bn skarn figns	---		0.25
20-22				----- & minor dk gr. hornfels	Tr py? tail		0.18
22-24				lt bn skarn & bry cly & minor dk gr. hornfels	garnet		0.22
24-26				50% lt bn skarn 50% dk gr. hornfels	---		0.52
26-28				lt bn skarn, dk gr-bk hornfels, olive gr. ststone?	---		0.76
28-30				lt bn skarn	---		0.37
30-32				----- & minor wh cly & v. minor bright gr. ststone?	---		0.24
32-34				lt bn skarn & wh clystne	minor garnet		0.20
34-36				-----, lim ctd npt, & minor bright gr. ststone?	v. minor --	*	0.41
36-38				gt-or ststone & pie-bk f-g rock figns - ironstone?	tr vr gt ₃	36-37	0.45
38-40				lt bn skarn, gt-or ststone, ironstone figns, & v. minor bright gr. ststone?	-----	37-39	0.86
40-42				-----	minor garnet tr vr gt ₃	39-41	0.98
42-44				gt-or ststone?, ironstone, v. minor lt bn skarn, gr. ststone figns	v. minor garnet v. minor vr gt ₃	41-43	0.72
44-46				-----	tr garnet minor vr gt ₃	43-45	0.38

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No 2M-1

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURUMBATEHAN

E.L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation $-60^\circ, 059^\circ \text{ mag}$

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM-2

FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	PANNED MINERALIZATION	SAMPLE No	Au (ppm)
-60°						
059° Mag						
0 - 2			rd-bn sandy clay sand & minor lat chips	GS 1985		0.64
0-6.5 6 3/4" hammer			v.small sample - rods dropped 1.00m damp bn clay, sandy w/ pt			1.19
6.5-23 6 1/2" drag			rods dropped 0.50m 4l-bn lat chips, minor yl-bn rugby cly, minor gtz, tr bright gn slstne?			0.72
23-36.5 4 1/2" hammer			yl-bn (tr rd-bn) lat chips, minor yl-bn rugby cly, tr bright gn slstne?, tr dk grn blk slstne.			1.67
27m PVC casing			yl-bn lat chips, v. minor bright gn slstne?, tr gtz, minor yl-bn cly			1.15
Water injection @ 23m			yl-bn lat chips, minor bright gn slstne?, minor yl-bn cly			0.52
10 - 12						
12 - 14			-----			5.81 1.50 1.28 1.02
14 - 16			lt bn skarn, yl lat chips, minor bright gn slstne?	minor garnet		0.52
16 - 18			-----, minor yl-bn lat chips, tr bright gn slstne?	-----		0.75
18 - 20			-----	-----		0.28
20 - 23			lime clst ferruginous skarn, minor lat chips, tr bright gn slstne?, tr large gtz fms.	-----		1.45
23 - 26			lt bn skarn, lime clst in pt, v. minor large fms bright gn slstne?, v. minor large gtz fms	garnet		1.94
26 - 28			-----, some cruging gtz, gtz fms	-----		0.72
28 - 30			----- & tr bright gn slstne?	-----		1.07
30 - 32			lt bn skarn, lime clst in pt, some cruging gtz, gtz fms in gn humfels	-----		0.41
32 - 34			----- & tr bright gn slstne?	-----		0.34
34 - 36			-----	-----		0.65
36 - 36.5 Not Sampled			-----	-----		
EOH						
25.5m	casing left in hole					

631985 29

HOLE.

HM3

PAGE

1 of

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MUARUMBATEMAN

E.L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation $-60^\circ, 059^\circ \text{ Mag}$

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No L14-3

FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	PANNED MINERALIZATION	SAMPLE NO	Au (ppm)
-60°						
059° mag						
0-18	6½ drag	O-2	Rd-bn sandy clg soil & minor gr-bn lat chips	GS 1985		0.60
18-60	6¼ hammer	2-4	gr-bn lat chips in rd-bn soil			0.63
Water injection @ 18m.		4-6	--- & minor rd-bn lat chips & tr bright gr slstne?			0.84
0-17 PVC casing		6-8	soft even f-q olive gr slstne & gr fibrous unng & minor gr-bn lat chips			0.75
		8-10	--- & minor skarn & v. minor dusty gtz fms & v. minor unng	v. minor garnet		0.35
		10-12	olive gr slstne & lim unng & lim ctd in pt, v. minor ferrug. skarn	---		0.52
		12-14	pale olive gr slstne, lim ctd in pt, lim unng in pt, v. minor lat chips, tr dusty gtz fms.	v. minor garnet spec Au? in tail		0.50
	Small sample	14-16	Strongly ferrug. f-g even g. rock - ironstone / skarn??, v. minor large fms chalcocite silica, tr bright gr slstne?	tr garnet		0.43
	V. small sample	16-18	---, tr in gtz.			0.69
		18-20	lt-bn skarn, minor olive gr f-q rock, tr wh clysne, v. minor lat chips (Contaminated??)	---		0.74
		20-22	lt-bn skarn, olive gr f-q rock, minor wh clysne, minor lat chips (Contaminated??)	---		0.31
		22-24	lt-bn slstne, minor wh clysne, tr lt-bn skarn v. minor lat chips	---		0.14
		24-26	---			0.16
		26-28	indur. gr-qz slstne, or-bn slstne, minor wh clysne, v. minor lt-bn sst, v. minor lat chips			0.08
		28-30	indur. gr-qz slstne, or-bn slstne, minor lt-qz indur. clysne, v. minor lt-bn sst & v. minor lat chips			0.15
		30-32	---			0.07
		32-34	---, tr wh clysne, tr lat chips			0.11
		34-36	---, minor lat chips, tr even f-q olive gr sst? ---, v.	2 pieces of coarse py (2mm) considerable py tail		0.33
		36-38	indur. gr-qz slstne, tr or-bn slstne, tr wh clysne, v.	considerable py tail but less than above		0.16
		38-40	indur. gr-qz slstne, tr or-bn sst, tr lat chips	minor py tail		0.30
		40-42	---, minor indur lt-qz clysne	---		0.24
		42-44	lt-gr-qz & dk gr-qz (indur) slstne	tr py tail		0.05

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

-DRILL HOLE No LM-3

GC 1988-124

HOLE.

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1 of

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEYAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation -60°, 058° mag

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE NO 111-4

-60° 058° mag	FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	PREDICTED MINERALIZATION	SAMPLE No	Au (ppm)
	0 - 2			Br-bn sandy clayey soil & wh sandy cl	tr garnet	HS 1985 22.4	BLD
	2 - 4			skarn in lt-bn sandy soil	garnet		BLD
0 - 6 PVC casing	4 - 6			dk grn f-g hornfels, lt-bn cl, v. minor skarn, minor lt chps	tr garnet		BLD
	6 - 8			-----, tr lt chps in bn sandy soil			BLD
	8 - 10			skarn frags in bn & lt gg sandy soil	minor garnet		BLD
	10 - 12			----- in bn sandy soil, tr gtz	garnet		0.29
	12 - 14			dk grn f-g hornfels & skarn pockets, tr skarn	coarse py, tr py tail		0.36
	14 - 16			----- tr gtz.	minor garnet		0.24
	16 - 18			----- tr skarn, minor gtz vns	tr py tail		0.07
	18 - 20			-----, tr skarn & gtz + py vns, tr gtz	garnet tr py tail		0.20
	20 - 22			dk grn f-g hornfels & skarn pockets (lt-grn & granular)	garnet py tail		0.11
	22 - 24			----- & tr gtz	garnet, disseminated & massive py, vns py, consider. py tail		0.22
	24 - 26			dk grn f-g hornfels & increasing skarn pockets & tr gtz	-----, py tail		0.06
	26 - 28			----- & minor gtz	garnet, tr disseminated py minor py tail		BLD
	28 - 30			----- & gtz vns	garnet tr py tail		BLD
	30 - 32			More skarn than hornfels & tr gtz py vns	garnet tr vns & disseminated py		0.06
	32 - 34			----- & tr gtz & tr gtz py vns	garnet, minor massive py, vug py, py tail		BLD
	34 - 36			----- & 50% indur. ggy & minor massive & sl/stone			0.06
	36 - 38			gt-gg indur sl/stone & tr gtz vns			BLD
	38 - 40			----- & tr milky gtz			BLD
	40 - 42			----- sandy mgt			BLD
	42 - 44			-----			BLD

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM-4

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MORRUMBATEMAN

E.L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation $-60^\circ, 059^\circ \text{ mag}$

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. WASHNER

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM-5

GC 1985 224

HOLE.

LM6

PAGE

1 of

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation -60°, 058° mag

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No 111-6

-60° 058° mag	FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	ANNOED MINERALIZATION	SAMPLE NO	Au (ppm)	
0-4.2 6½" drag 4.2-40 6¼" hammer 0-4.2 PVC casing	0 - 2			rd-bn sandy clay soil & ferruginous skarn frags	garnet	198	0.05	
	2 - 4.2			gn indur. siltstone & minor ferruginous skarn & tr. wh. kaol. gtz purple?	tr. garnet		BLD	
	4.2 - 6			gn indur siltstone & minor ferruginous skarn	---		0.06	
	6 - 8			---	---		0.09	
	8 - 10			gn indur siltstone, dk gr. hornfels & minor ferruginous skarn	v. mineral py tail		BLD	
	10 - 12			50% gn indur siltstone 50% dk gr. gn. hornfels & tr. gtz	tr. garnet tr. py tail		BLD	
	12 - 14			dk gr. hornfels & skarn pockets	tr. py tail		BLD	
	14 - 16			--- & minor ferruginous skarn & tr. gn indur siltstone	minor garnet		0.06	
	16 - 18			blue gy hornfels & skarn pockets & tr. rd-bn indur. siltstone	garnet		0.70	
	18 - 20			bl-gy hornfels & skarn pockets	---		4.66	
	20 - 22			91-99 ---	tr. py tail		3.80	
	22 - 24			dk gr. --- & tr. silky gtz	garnet, tr. py tail, tr. disseminated		1.02	
	24 - 26			--- & tr. gtz mng	garnet		0.47	
	26 - 28			---	---, tr. py tail tr. disseminated		0.07	
	28 - 30			---	---		BLD	
	30 - 32			--- but more skarn	garnet		BLD	
	32 - 34			---	---		BLD	
	34 - 36			---	---		BLD	
	36 - 38			--- & minor gyslimestone & tr. gtz	---, tr. gtz		0.09	
	38 - 40			dk gy indurated siltstone			BLD	
	EOH							
	All Casing left in hole							

GC 1925 121

HOLE.

LM7

PAGE

1 of

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E.L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation $-60^\circ, 058^\circ \text{ Mag}$

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD – R.A.B./Percussion Log Sheet

DRILL HOLE No LM-7

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURUMBATEMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation -60°, 060 mag

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD – R.A.B./Percussion Log Sheet

DRILL HOLE No LM-8

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation $-60^\circ, 059^\circ \text{ mag}$

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM-9

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation $-60^{\circ}, 059^{\circ}$ mag

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD – R.A.B./Percussion Log Sheet

DRILL HOLE No LM-10

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MORRUMBATEMAN

E. L.

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared

completed

logged

logged by T. NASHAR

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM 11

Vertical 0 - 18 6 ^{1/2} drag 18 - 62 6 ^{1/4} hammer Water injection @ 18m. 0 - 9m PVC casing	FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	PANNED MINERALIZATION	SAMPLE No	Au (ppm)		A
	0 - 2			Or-br sandy clayey soil & minor rd-br sandy clayey soil			0.19		
	2 - 4			Lst chips & minor bright v.f.g. sst (skarn??)	garnet	601985	0.20		
	4 - 6			Lim clt bright gr v.f.g. sst, ferrug. inf & minor lst chips & tr gtz.	- - -		0.88		
	6 - 8			- - - - -	minor garnet		1.33		
	8 - 10			Br-kk ironstone, minor lim clt & vred bright gr v.f.g. sst, minor lst chips & minor or-br cly	- - - -		0.20		
	10 - 12			Lst chips, minor lim clt bright gr sst, minor gtz, minor or-br cly	garnet		1.24		
	12 - 14			- - - - - , minor ferrug. skarn	- - -		0.47		
	14 - 16			Lim clt bright gr sst, minor ironstone, minor lst chips, tr gtz	minor garnet		0.34		
	16 - 18			- - - - - , minor lst chips, tr lt br skarn, tr gtz.	- - - -		0.26		
	18 - 20			Lim clt gr sst, minor lst chips, tr ferrug. skarn, minor wh chalcopyrite, tr gtz.	garnet		0.13		
	20 - 22			Soft wh chalcopyrite minor lst chips, v. minor ferrug. skarn, tr gtz - Sludge			0.16		
	22 - 24			- - - - - , lim clt m.pt, v. minor lst chips Sludge			0.09		
	24 - 26			Soft khaki chalcopyrite, - - - - -			BLD		
	26 - 28			- - - - - , tr lst chips			BLD		
	28 - 30			- - - - - "			BLD		
	30 - 32			minor wh pyrite cly - - -			BLD		
	32 - 34			- - - - - , minor wh pyrite cly			BLD		
	34 - 36			- - - - - , tr lst chips, - Sludge			BLD		
	36 - 38			- - - - - , minor - - -			BLD		
	38 - 40			gg & minor gg-br indur sst, minor wh/khaki chalcopyrite, minor lst chips			BLD		
	40 - 42			gg indur sst & minor soft chalcopyrite & v. minor lst chips			BLD		
↓ V.V. small samples	42 - 44			gg indur sst & v. minor sandy phases & v. minor soft chalcopyrite & tr lst chips			BLD		

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM 11

G 19 124

HOLE.

LM12

PAGE

1 of 3

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name

MURRUM BATEMAN

E.L.

2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE

orientation

VERTICAL

total depth

59m

DRILLING

contractor

rig

method

core sizes

casing

misc.

DATE

collared

21/11/85

completed

22/11/85

logged

CORE

logged by

NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM12

FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	PANNED MINERALIZATION	SAMPLE No	Au		
0-7.5 DRAG BET	0-3		WEATHERED, grey brown, 20-2 porphyry, minor clay material.	G 1985 22	40-3	BLD	.	.
7.5 → E.O.H 6" HAMMER	3-6		" " " "	-	✓ 3-6	BLD		
	6-8		SLIGHTLY WEATHERED, grey quartz, minor porphyry rare white milky quartz	-	✓ 6-8	0.08		
	8-10		" " " "	-	✓ 8-10	BLD		
	10-12		Grey to brown, siltstone, sandy in parts. (hornfelsic)	-	✓ 10-12	BLD		
	12-14		" " " "	-	✓ 12-14	BLD		
	14-16		Grey hornfels, minor siltstone shown.	-	✓ 14-16	BLD		
	16-18		" " " "	-	✓ 16-18	BLD		
	18-20		50% grey hornfels, 50% siltstone, shaly in part brown to grey in colour	-	✓ 18-20	BLD		
	20-22		100% grey hornfels, with very rare quartz	-	✓ 20-22	BLD		
	22-24		" " " "	-	22-24	BLD		
	24-26		Quartz porphyry, grey green in colour. siliceous bright green material (quartz?) is common	-	✓ 24-26	BLD		
	26-28		" " " "	-	✓ 26-28	BLD		
	28-30		Quartz, minor porphyry, grey green in colour, quartz clear in colour and possibly light green (?) sericitic (?)	-	✓ 28-30	BLD		
	30-32		" " " "	-	✓ 30-32	BLD		
	32-34		" " " "	-	✓ 32-34	BLD		
	34-36		" " " "	-	✓ 34-36	BLD		
	36-38		" " b " "	-	✓ 36-38	BLD		
	38-40		" " " "	-	✓ 38-40	BLD		
	40-42		" " " "	-	✓ 40-42	BLD		
	42-44		" " " "	-	✓ 42-44	BLD		
	44-46		" " " "	-	✓ 44-46	BLD		

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM 12

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 35 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 22/11/85

completed 23/11/85

logged

CORE logged by NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM.13

FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	MINERALIZATION	SAMPLE No	Au		
0-3			Clay soil orange brown in colour G	1985 +0/-1	/ 0-3	BLD	.	.
0-9 6" BLADE								
9- 6" HAMMER								
3-5			Soil C horizon, quartz fragments, porphyry	-	/ 3-5	BLD		
5-7			weathered quartz biotite porphyry, + Soil C	-	/ 5-7	BLD		
7-9			weathered quartz biotite porphyry	-	/ 7-9	BLD		
9-11	BASE OF OXIDATION	~~	Slightly weathered quartz biotite porphyry	-	/ 9-11	BLD		
11-13			Fresh quartz, biotite porphyry	-	/ 11-13	BLD		
13-15			Slightly weathered, qtz, possible small shear zone	-	/ 13-15	BLD		
15-17			Fresh quartz biotite porphyry	-	/ 15-17	BLD		
17-19			" "	-	/ 17-19	BLD		
19-21			" "	-	/ 19-21	BLD		
21-23			" "	-	/ 21-23	BLD		
23-25			" "	-	/ 23-25	BLD		
25-27			" "	-	/ 25-27	BLD		
27-29			" "	-	/ 27-29	BLD		
29-31			" "	-	/ 29-31	BLD		
31-33			" "	no small grain of pyrite found	/ 31-33	BLD		
33-35			" "	-	/ 33-35	BLD		
E.O.H			35 metres					

WET
SAMPLES
GRAB
TAKEN

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATHMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 4.0 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 23/11/85

completed 23/11/85

logged

CORE logged by NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM 14

FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	MINERALIZATION	SAMPLE No	Au	
BLPTDE 6' - 3m SPRMLR 6' - 8' 0"			Soil + clay brown / grey in colour	GS 1985 2?	40-3	BLD	.
0 - 3			Cherty light brown, fragments, quartz, fragments + strongly Fe stained material		1 3 - 5	BLD	
3 - 5			Siltstone light creamy brown in colour (80%) + strongly Fe stained material		1 5 - 7	BLD	
5 - 7			Lenticular brown chky material, qtz fragments common, bright green material common rare siltstone fragments, and iron stained material, weathered porphyry, limonitic		1 7 - 9	BLD	
7 - 9			" " "	"	1 9 - 11	BLD	
9 - 11			" " "	"	1 11 - 13	BLD	
11 - 13			" " "	"	1 13 - 15	BLD	
13 - 15			" " "	"	1 15 - 17	BLD	
15 - 17			" " "	"	1 17 - 19	BLD	
17 - 19			" " "	"	1 19 - 21	BLD	
19 - 21			" " "	"	1 21 - 23	BLD	
21 - 23			" " "	"	1 23 - 25	BLD	
23 - 25			Grey siltstone, only minor Fe staining		1 25 - 27	BLD	
25 - 27			" " "		1 27 - 29	BLD	
27 - 29			" " "		1 29 - 31	BLD	
29 - 31			" " "		1 31 - 33	BLD	
31 - 33			Quartz porphyry, with flecks of bright green material throughout		1 33 - 36	BLD	
33 - 36			Quartz porphyry (50%) Grey intercalated siltstone (50%)		1 36 - 38	BLD	
36 - 38			Quartz porphyry, grey in colour		1 38 - 40	BLD	
38 - 40			" " "				
E.O.H			40 metres				

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 35 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 23/11/85

completed 23/11/85

logged

CORE logged by NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No ...LMIS...

BLADE 6"- 3"	FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	MINERALIZATION	SAMPLE No	AU	
HAMMER → E O.H. 6"	0 - 3			Red/brown clayey soil, and light tan siltstone material	A, S, T, V	/ 0-3	BLD	.
	3 - 5			Fe stained material, and light brown clayey material		/ 3-5	BLD	
	5 - 7			Siltstone, greenish-grey in colour, moderately Fe stained, chips in a powdery light brown clay material		/ 5-7	BLD	
DRY SPLIT ↑	7 - 9		" " " "	" "		/ 7-9	BLD	
	9 - 11		" " " "	" "		/ 9-11	BLD	
	11 - 13			Light green in colour, quartz porphyry, in some powdery light brown clb. material		/ 11-13	BLD	
	13 - 15			As for 5-11		/ 13-15	BLD	
	15 - 17		" " "			/ 15-17	BLD	
	17 - 19			greenish/grey siltstone, minor quartz porphyry, + brown sst fine grained material		/ 17-19	BLD	
	19 - 21			Brown sandstone, fine grained, minor Fe staining + minor green/grey siltstone.		/ 19-21	BLD	
	21 - 23		" " " "	" "		/ 21-23	BLD	
	23 - 25			Grey indurated siltstone, with minor dark grey laminae's material.		/ 23-25	BLD	
	25 - 27		" " " "	" "		/ 25-27	BLD	
	27 - 29		" " " "	" "		/ 27-29	BLD	
	29 - 31		" " " "	" "		/ 29-31	BLD	
	31 - 33		" " " "	" "		/ 31-33	BLD	
	33 - 35		" " " "	" "		/ 33-35	BLD	.
E.O.H.				35 metres				

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 29 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 24/11/85

completed 24/11/85

logged

CORE logged by NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD – R.A.B./Percussion Log Sheet

DRILL HOLE No LM 16

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUM RATEMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 32 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 24/11/85

completed 24/11/85

logged

CORE logged by NFS

split by

assayed by

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DRILL HOLE NO ... LM...17...

FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	MINERALIZATION	SAMPLE No	Ru	
BLADE 6' - 6"			Soil red / brown some clay material + limonitic material, brown siltstone (60%)	1	1-6	BLD	
W.HAMMER 6" - 8' 0"			Grey/white claystone, much clay material, some minor limonitic material.		1-6	BLD	
6-8	"	"	" "		16-8	BLD	
8-10	"	"	" "		18-10	BLD	
10-12	"	"	" "		10-12	BLD	
12-14	"	"	" "		12-14	BLD	
14-16	"	"	" "		14-16	BLD	
16-18			Claystone + siltstone, grey/white to light brown in colour, clay common, limonite minor		16-18	BLD	
18-20	"	"	" "		18-20	BLD	
20-22	"	"	" "		20-22	BLD	
22-24			As for 16-22, but rare gto fragments		122-24	BLD	
24-26	"	"	" "		124-26	BLD	
26-28			Brown siltstone, possibly nodular, stained, minor Fe staining		126-28	BLD	
28-30	"	"	" "		128-30	BLD	
30-32	"	"	" "		130-32	BLD	
E.G.H			32 metres				

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E. L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 26 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 24/11/85

completed 24/11/85

logged

CORE logged by NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM-18

BLADE 6"-10m HAMMER 6"-E.O.H.	FROM - TO (metres)	COLOUR	GRAPHIC LOG	GEOLOGICAL DESCRIPTION	MINERALIZATION	SAMPLE No	Au		
	0-3			Soil + grey brown clay + minor qtz fragments	GS 1985	/ 0-3	BLD		
	3-6			Strongly weathered, Fe stained, quartz porphyry		/ 3-6	BLD		
	6-9			" " "		/ 6-9	BLD		
	9-12			" " "		/ 9-12	BLD		
	12-15			" " "		/ 12-15	BLD		
	15-18			Slightly weathered quartz, biotite, porphyry with minor Fe staining		/ 15-18	BLD		
	18-21			" " "		/ 18-21	BLD		
	21-24	Base of oxidation		Fresh quartz biotite porphyry, then possible shear zone, large quartz fragments + lot of clay material		/ 21-24	BLD		
	24-26			Fresh quartz biotite porphyry		/ 24-26	BLD		
E.O.H.				26 metres					

GS 1985 2

HOLE.
LM 19PAGE
1 of 2

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUM BATEMAN

E.L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 20 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 24/11/85

completed 24/11/85

logged

CORE logged by NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B. / Percussion Log Sheet

DRILL HOLE No LM 19

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E.L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 20 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 29/11/85

completed 29/11/85

logged

CORE logged by NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD – R.A.B./Percussion Log Sheet

DRILL HOLE No Lm 2c

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E.L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 20 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 29/11/85

completed 29/11/85

logged

CORE logged by NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD – R.A.B./Percussion Log Sheet

DRILL HOLE No LM 21

GC 1985 224

HOLE.

LM 22

PAGE

1 of 2

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E.L. 2375

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation VERTICAL

total depth 20 metres

DRILLING contractor

rig

method

core sizes

casing

misc.

DATE collared 29/11/85

completed 29/11/85

logged

CORE logged by NFS

split by

assayed by

MINERAL MANAGEMENT & SECURITIES PTY. LTD - R.A.B./Percussion Log Sheet

DRILL HOLE No LM 22

6000000 224

APPENDIX 4

Diamond Corehole Log
and Assay Results



D001054360

MINERAL MANAGEMENT SERVICES.

DRILL LOGS.

PROSPECT name MURRUMBATEMAN

E. L.

LOCATION refer plan

grid ref.

collar R.L.

HOLE orientation -60°

total depth 21.45m

DRILLING contractor EARTH BORING SERVICES PTY LTD

rig PIONEER

method

core sizes PQTT

casing

misc.

DATE collared

completed

logged

CORE logged by T. NASHAR

split by "

assayed by FOX LABORATORIES

G31965

HOLE

MUMI

PAGE

of

MINERAL MANAGEMENT SERVICES.

DRILLING RECORD.

RODS length. stick up.	CORING RUN from	to.	RUN	CORE RECOVERED	% recovery.	REMARKS
	0	0.50	0.50	0.50		
	0.50	1.00	0.50	0.50		
	1.00	2.00	1.00	0.90		
	2.00	3.50	1.50	0.75		
	3.50	4.50	1.00	1.01		
	4.50	5.60	1.10	0.84		
	5.60	6.50	0.90	0.46		
	6.50	7.85	1.35	1.39		
	7.85	9.50	1.65	1.62		
	9.50	11.00	1.50	0.35		
	11.00	11.80	1.80	0.30		
	11.80	12.50	0.70	0.45		
	12.50	13.65	1.15	1.15		
	13.65	15.30	1.65	1.45		
	15.30	16.95	1.65	1.53		
	16.95	18.45	1.50	0.87		
	18.45	19.95	1.50	0.35		
	19.95	21.45	1.50	0.80		
		E04				

MINERAL MANAGEMENT SERVICES.

MURRUMBATEMAN

GS 1985

hole no. MUM 1 pag

DEPTH		RECOVERY	LITHOLOGY	ALTERATION	MINERALIZATION	STRUCTURE	ASSAYS		
from	to	run / %	name / description / weathering.	type/degree.	% sulphides/mineralogy/type.	description/θ/density/fill.	interval	no.	Au
0	2	2.00 CW	Top 10cm Hb sandy soil, 20cm Hrd-bn sandy cly & lat pebs, 70cm dk bn-rd sandy cly & lat pebs, 1.00m as far latter but minor irreg yl sandy patches, flenses	Soft v. broken Crushed mpt.	8888888888			3693	1.02
2	4	1.63 HW	Yl-br & minor rd-bn cly/g garnet rich matrix, schistose in pt & tourmaline welded in pt	---		garnet, lim	1mm v. minor irreg. apple gr vns	3694	0.99
4	6	1.70 HW	Yl-or-br cly/g skarn & patches yl & minor yl-gr sandy cly flens.	Mod. soft broken		garnet, vr lim, discrete lim	3cm irregular lim vns to 2cm. Fracture zone @ 5.85m. Unheated open space & lim & yl gr sandily fill.	3695	0.36
6	8	1.68 HW	---	---			irreg lim vns.	3696	0.29
8	10	1.84 HW	----- Patch (6cm) E 5cm rd-bn halo, 9-10cm as above E yl/or cly patches elongate along bedding	Mod soft v. broken				3697	0.47
10	12	0.23 HW	Pebbles of above in br sandy cly	v. soft v. broken Crushed comp.				3698	3.76
12	14	1.87 HW	12.0-12.5m Yl-or-br skarn, schistose in pt, & minor irreg milky gtz cement/fill & c many patches apple gr mineral. 12.5-14 as above but yl-or, no gtz fill & much more apple gr mineral	v. soft v. broken Crushed mpt.			lim on gtz.	3699	0.82
14	16	1.60 HW	Yl-or-skarn & elongate patches or-br cly along bedding. 15.30 onwards increasing or cly patches	Soft ---			1mm nearly irreg axial vns. 1mm 14.6-14.7 Yl-or cly (bedded?) & wh sandy cly vns & ca (along bedding?)	3700	0.18
16	18	1.82 HW	----- E to patches apple gr mineral & 17.70-17.8 discrete wh cly mineral.	v. soft Crushed comp.			irreg lim vns	3527	0.54
18	20	0.35 HW	-----	---				3528	0.90
20	21.45	0.80 HW	Mottled yl-or-gr-br sandy cly & patches lim & patches apple gr mineral flens. V. minor whcly flens & yl cly patches flens.	Soft ---		lim fd garnet ?? vr dissolution		3529	0.12
		EOH		Crushed mpt.					11

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APPENDIX 5

Preliminary Metallurgical Testing



D001054370

6.1.9

WARMAN INTERNATIONAL LTD.

(Incorporated in Queensland)

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TELEX: AA20711

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LABORATORIES.
6-8 McLACHLAN AVE
ARTARMON
SYDNEY
NEW SOUTH WALES

SFR:sh RESEARCH & DEVELOPMENT DIVISION REPORT
85/959

Report 85/173502

Preliminary Metallurgical Testing
of
Murrumbateman Ore

for

Mineral Management & Securities Ltd

S.F. Rayner
D.B. Hewes

May 30, 1985

SUMMARY

Three preliminary samples from Murrumbateman have been tested for their response to gold extraction with encouraging results. From samples assaying 2.0, 0.4 and 5.1 g/t Au, leach tailings of 0.12, 0.04 and 0.12 g/t Au were obtained, over 90% gold dissolution, most of it within 6 hours reaction time.

Though the above results were obtained on finely milled ore portions, they do open up the possibility of heap leaching as a lower cost treatment technique. The negative aspect of the tests obvious here was the hydrous clay nature of the first two samples designated oxidised ore. High 17 kg/t hydrated lime demand by these samples during leaching when translated to a heap operation could cause percolation and gold recovery problems.

It is suggested that a logical step for any further investigation would be to determine the association of gold with the clays and establish the quantity of oxidised ore compared to the less troublesome fresh ore.

1. INTRODUCTION

Three ore samples taken from between 6-22 metres depth were submitted with a request to establish their response to gold extraction by cyanide leaching. The program approved involved fine crushing, blending and leaching, after fine grinding, for 24 hours at pH 10.5 with 0.1% NaCN solution.

2. SAMPLE DESCRIPTION/PREPURATION

The three samples were each reduced to a uniform dry size as shown in Table 1 with 8 x 1 kg working samples cut out together with two head samples from different half portions. The results of these assays are also shown in Table 1 with average grades of;

LM2	1.96 g/t Au
LM3	0.38 g/t Au
LM6	5.09 g/t Au

Agreement between assay portions indicates finely dispersed gold and by inference not much free or gravity recoverable gold.

TABLE 1

Sample identification/preparation

identification	LM2 6-8 m oxidised ore	LM3 10-12 m oxidised ore	LM6 20-22 m fresh ore
form	broken rock	sticky clay	dry powdery
preparation	dried, jaw crushed, riffle divided	dried, jaw crushed, riffle divided	riffle divided
dry weight	27 kg	40 kg	25 kg
gold level supplied	1.67 g/t	0.52 g/t	3.80 g/t
<u>Warman fire assays</u>			
g/t Au - portion A	1.76, 1.89	0.56, 0.24	5.09, 5.06
- portion B	2.10, 2.08	0.36, 0.34	5.25, 4.93
- average	1.96	0.38	5.09

3. CYANIDE LEACHING

As mentioned previously the samples were finely milled (90% passing 75 μm) and pulped with water for leaching using mechanical beaker agitation. The two oxidised samples proved quite viscous especially after addition of lime and required dilution from 50% solids to about 45% to overcome the problem. The two oxidised zone samples also exhibited acid slurry pH values and required considerable hydrated lime (17 kg/t) to reach pH 10.5, presumably due to reaction with clays. In contrast the fresh ore LM6 was non-viscous, had an alkaline slurry pH and required only 0.5 kg/t of lime.

The cyanide consumption of the samples contrasted in a similar manner with the two oxidised ore samples consuming cyanide throughout the tests while the fresh ore proved light in its demand as shown by the following 6 hour consumption figures;

LM2	1.9 kg/t NaCN
LM3	2.0 kg/t NaCN
LM6	0.5 kg/t NaCN

The test data is presented quantitatively in Table 2, the striking feature apart from the reagent figures being the rapid and almost complete dissolution of gold even from the higher grade fresh ore, with the tailings assaying 0.12, 0.04 and 0.12 g/t Au respectively.

For first tests the results appear very encouraging and would support efforts to establish ore tonnages. From an interpretive point of view, all samples could be handled in a mill/leach plant although some attempt would be required to reduce the high reagent consumption of the oxidised ore. Not much is understood about the physical nature of the ore so comments upon percolation characteristics for a heap leach operation are not possible. Gold dissolution rates would certainly support looking at heap testing,

particularly for fresh ore but for oxidised ore high lime consumption would cause gypsum deposits in the heaps and restrict percolation and hence gold extraction. The only approach might be to add lime or cement to the ore going into the heaps so that it is in restricted but distributed availability and observe the results.

TABLE 2

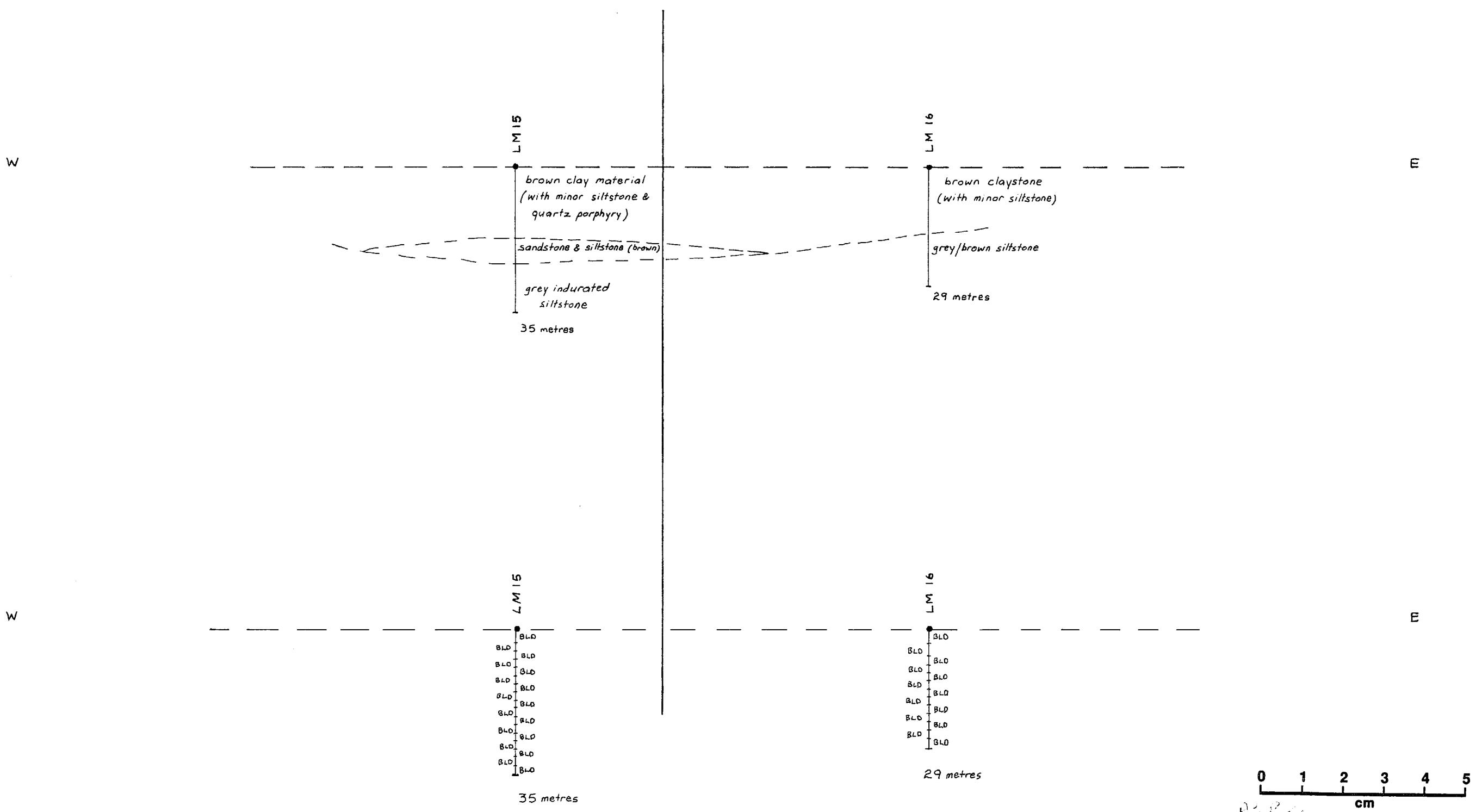
Cyanide leach data
(pH 10.5, 0.1% NaCN, 24 hours)

sample	LM2	LM3	LM6
head grade g/t Au	1.96	0.38	5.09
weight treated	1005 g	1012 g	1009 g
rod mill retention (mins)	12.5	20	15
leach % solids	45	47	50
initial pH	5.4	4.8	8.3
hydrated lime kg/t	17.9	17.0	0.5
<u>NaCN</u>			
final concentration %	0.038	0.036	0.078
consumption - 6 hr	1.9	2.0	0.5
- 24 hr	2.7	2.7	1.4
<u>6 hour assays</u>			
mg/l Au	1.72	0.71	4.38
g/t Au	0.16	0.06	0.14
back calc head g/t Au	2.44	0.94	4.67
<u>24 hour assays</u>			
mg/l Au	1.85	0.80	4.77
g/t Au	0.12	0.04	0.12
back calc head g/t Au	2.58	1.07	5.06
<u>sizing of tails - % passing</u>			
300 µm	100	100	100
75 µm	96	92	95
<u>% gold leached *</u>			
6 hr	92	84	97
24 hr	94	90	98

* based on head and tail fire assays

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LINE 1



D001054380

MINERAL MANAGEMENT & SECURITIES

EL 2375

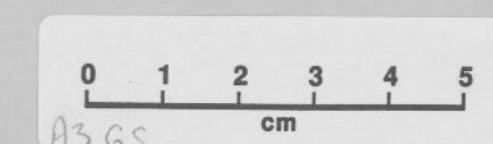
MURRUMBATEMAN , N.S.W.

SECTION THROUGH LINE 1

Looking Grid North

scale: 1:1000 Plan No 3

LINE 3



D001054390

MINERAL MANAGEMENT & SECURITIES

EL 2375

MURRUMBATEMAN, N.S.W.

SECTION THROUGH LINE 3

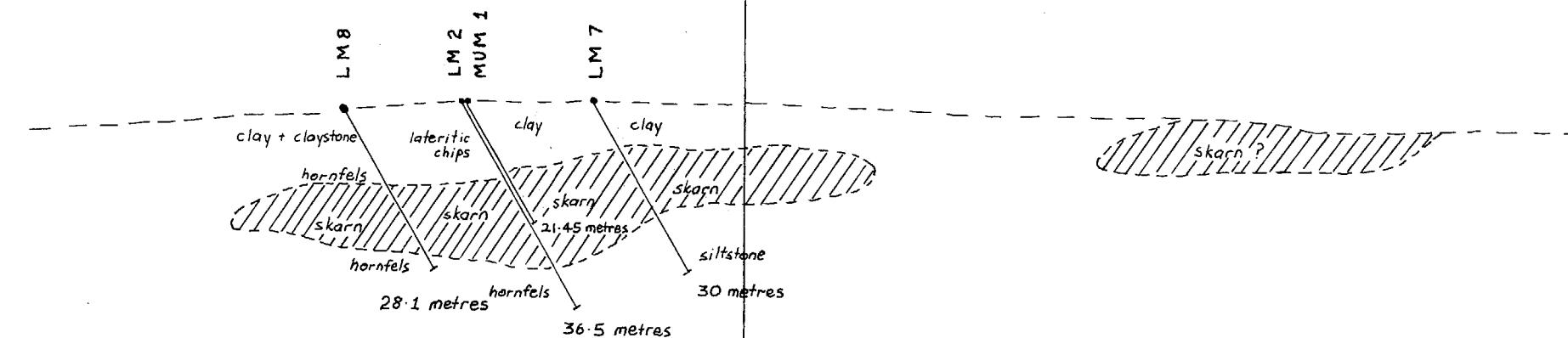
Looking Grid North

Scale: 1:1000 Plan No 4

LINE 4

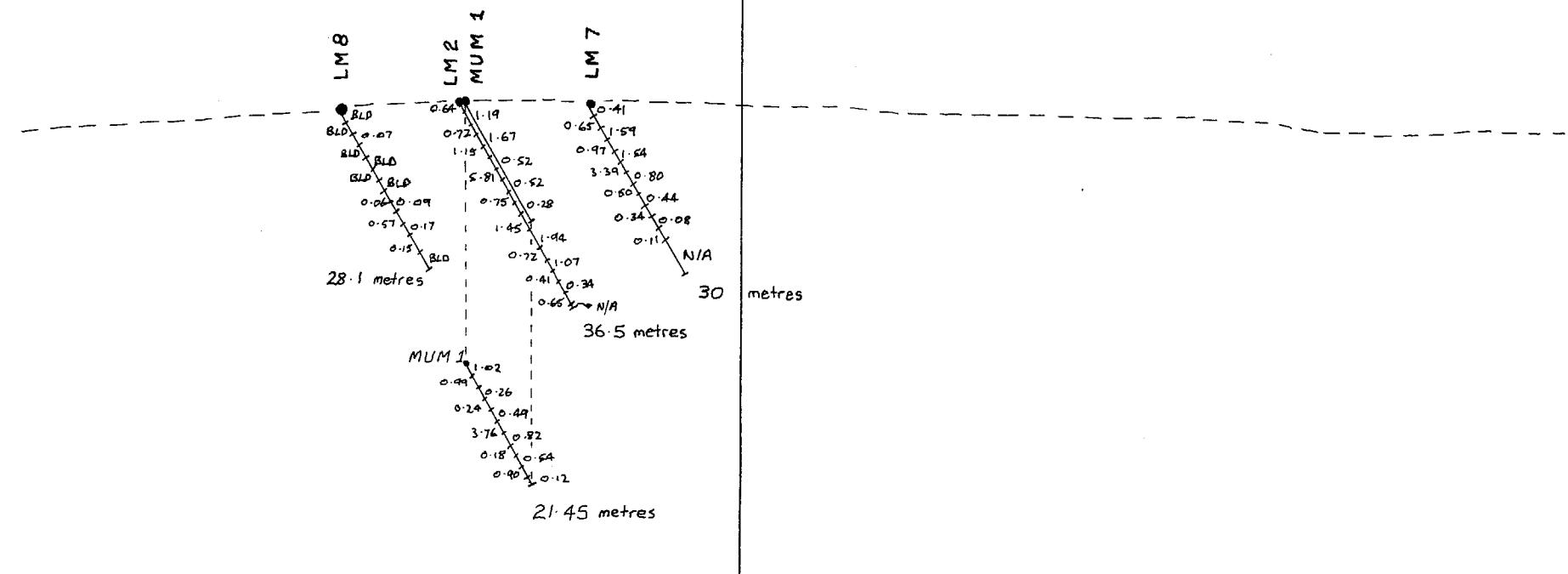
W

E



W

E



0 1 2 3 4 5
cm
P.S. 12.00



D001054400

MINERAL MANAGEMENT & SECURITIES

EL 2375

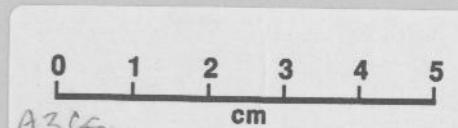
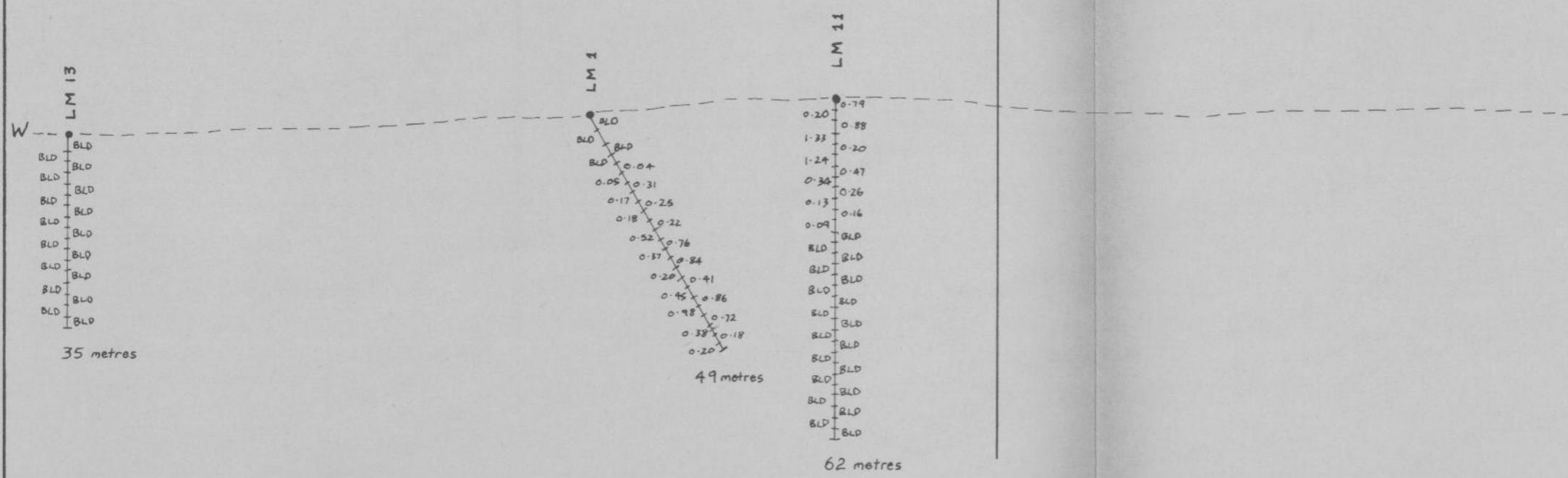
MURRUMBATEMAN, N.S.W.

SECTION THROUGH LINE 4

Looking Grid North

Scale: 1:1000	Plan No: 5
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LINE 6



A standard linear barcode is located at the bottom right of the page.

D001054410

MINERAL MANAGEMENT & SECURITY

EL 232E

EE 2575
MURBUMBATEMAN N.S.W.

SECTION THROUGH LINE 6

SECTION THROUGH LINE 6
LOOKING SOUTHEAST

Scale: 1 : 1000 Plan No 5A

LINE 8

MINERAL MANAGEMENT & SECURITIES

EL 2375

MURRUMBATEMAN, N.S.W.

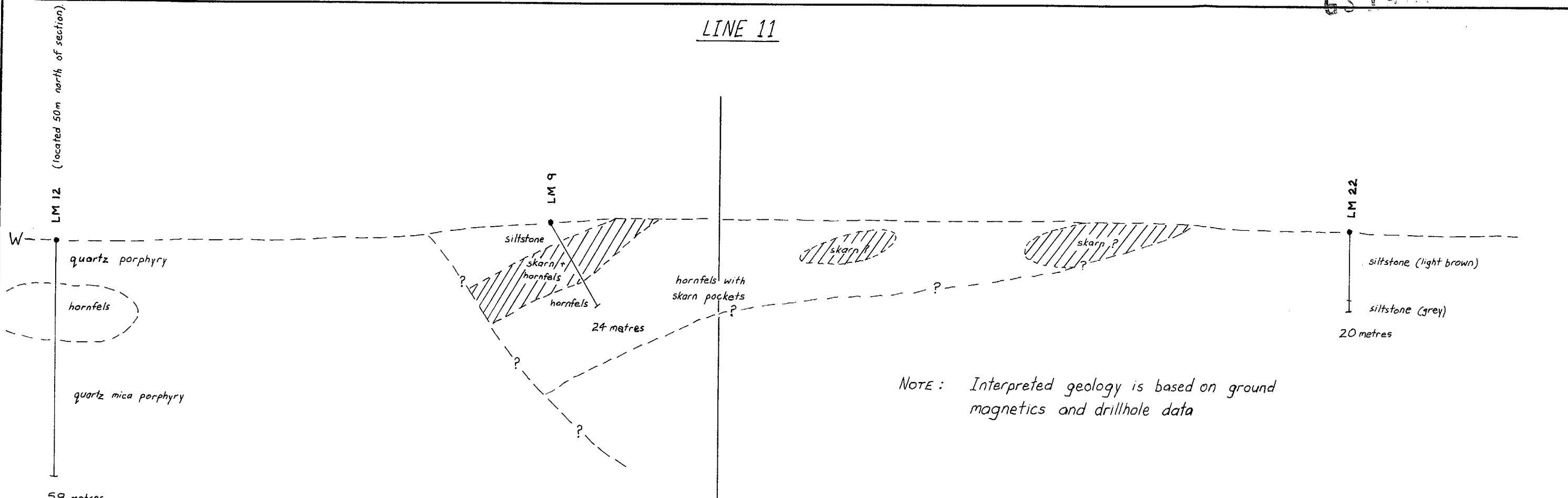
SECTION THROUGH LINE 8

Looking Grid North

Scale: 1: 1000 Plan No 6

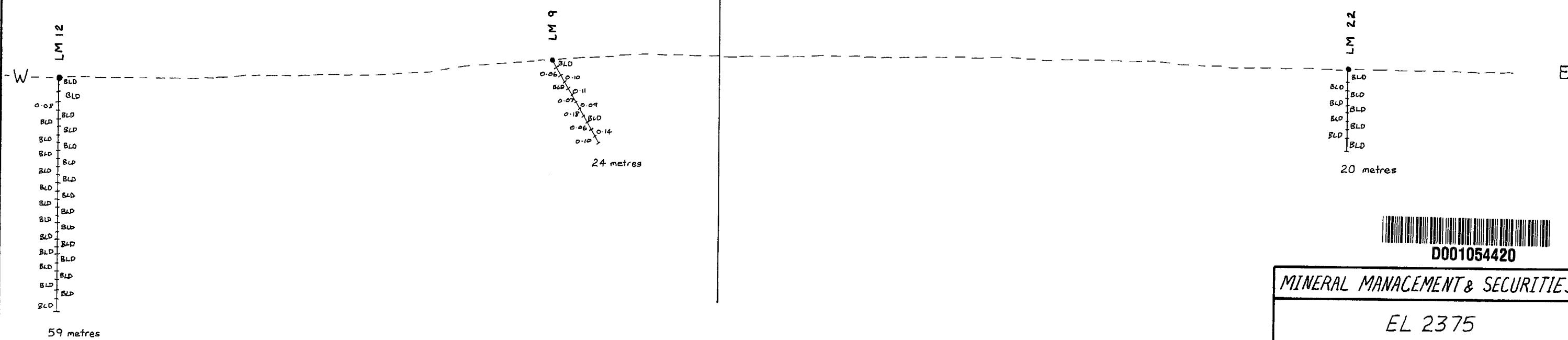
GS 1995

LINE 11



NOTE : Interpreted geology is based on ground magnetics and drillhole data

A horizontal metric ruler is shown, marked from 0 to 5 centimeters. The numbers 0, 1, 2, 3, 4, and 5 are printed above the ruler. Below the ruler, the word "cm" is printed in a bold, italicized font.



D001054420

MINERAL MANAGEMENT & SECURITY
EL 2375
MURRUMBATEMAN, N.S.W.
SECTION THROUGH LINE 11

1:1000 Plan No 7

GS 1085 928

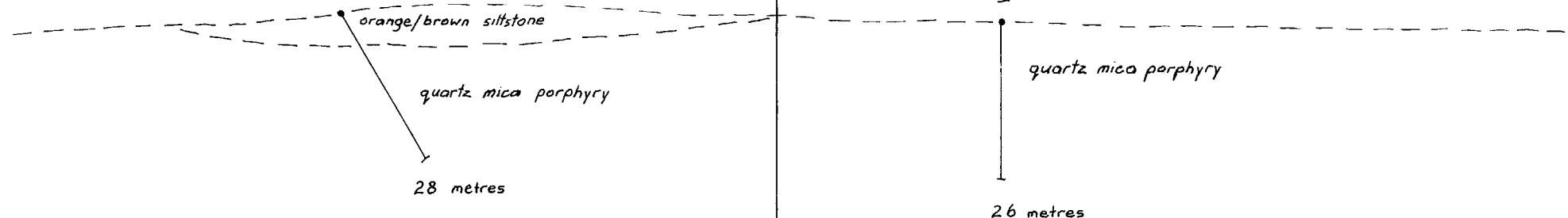
LINE 16

W

E

LM 10 (located 40m north
of section)

LM 18 (located 50m south
of section)

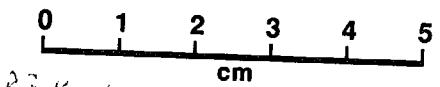
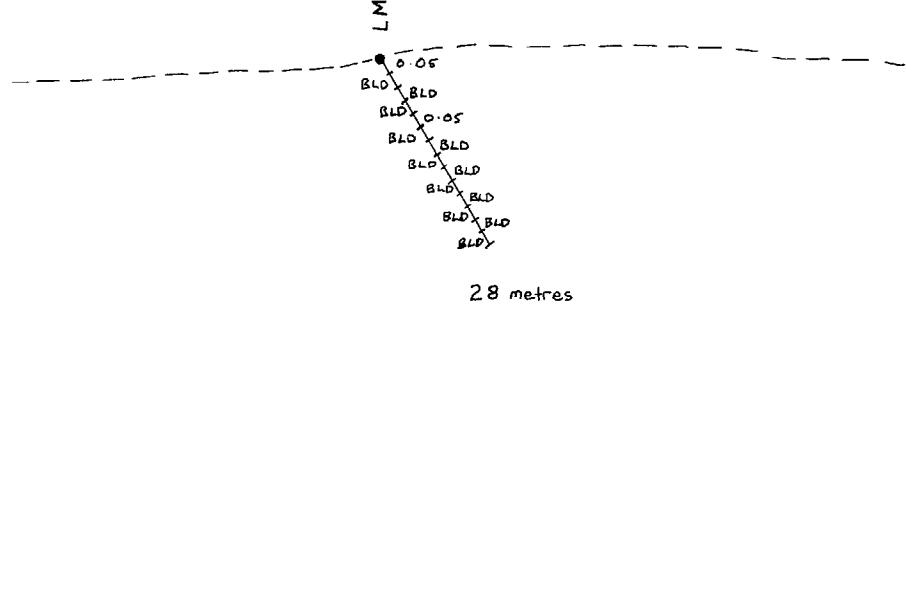


W

E

LM 10

LM 18



MINERAL MANAGEMENT & SECURITIES

EL 2375

MURRUMBATEMAN, N.S.W.

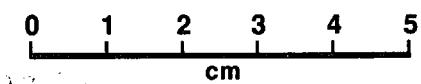
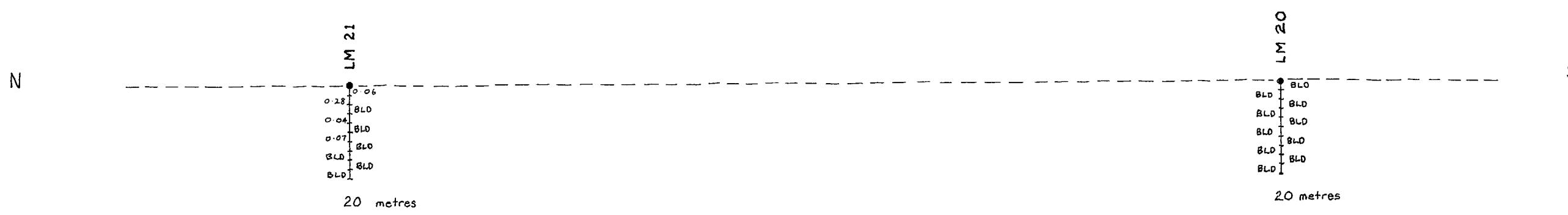
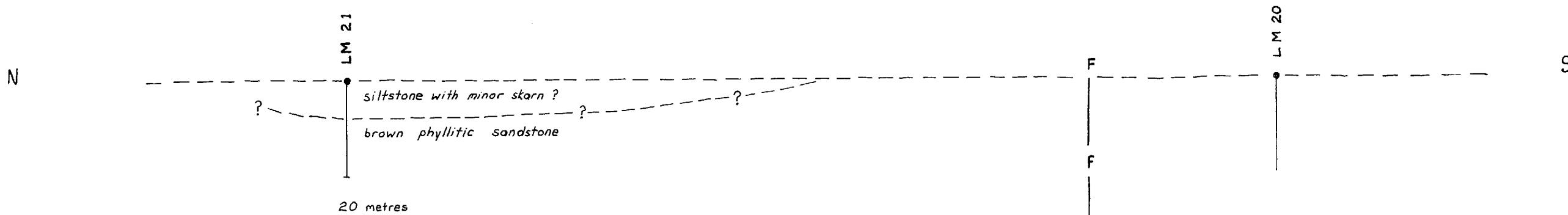
SECTION THROUGH LINE 16

Looking Grid North

scale: 1:1000 Plan No 8

GS 1985 224

EASTERN RIDGE



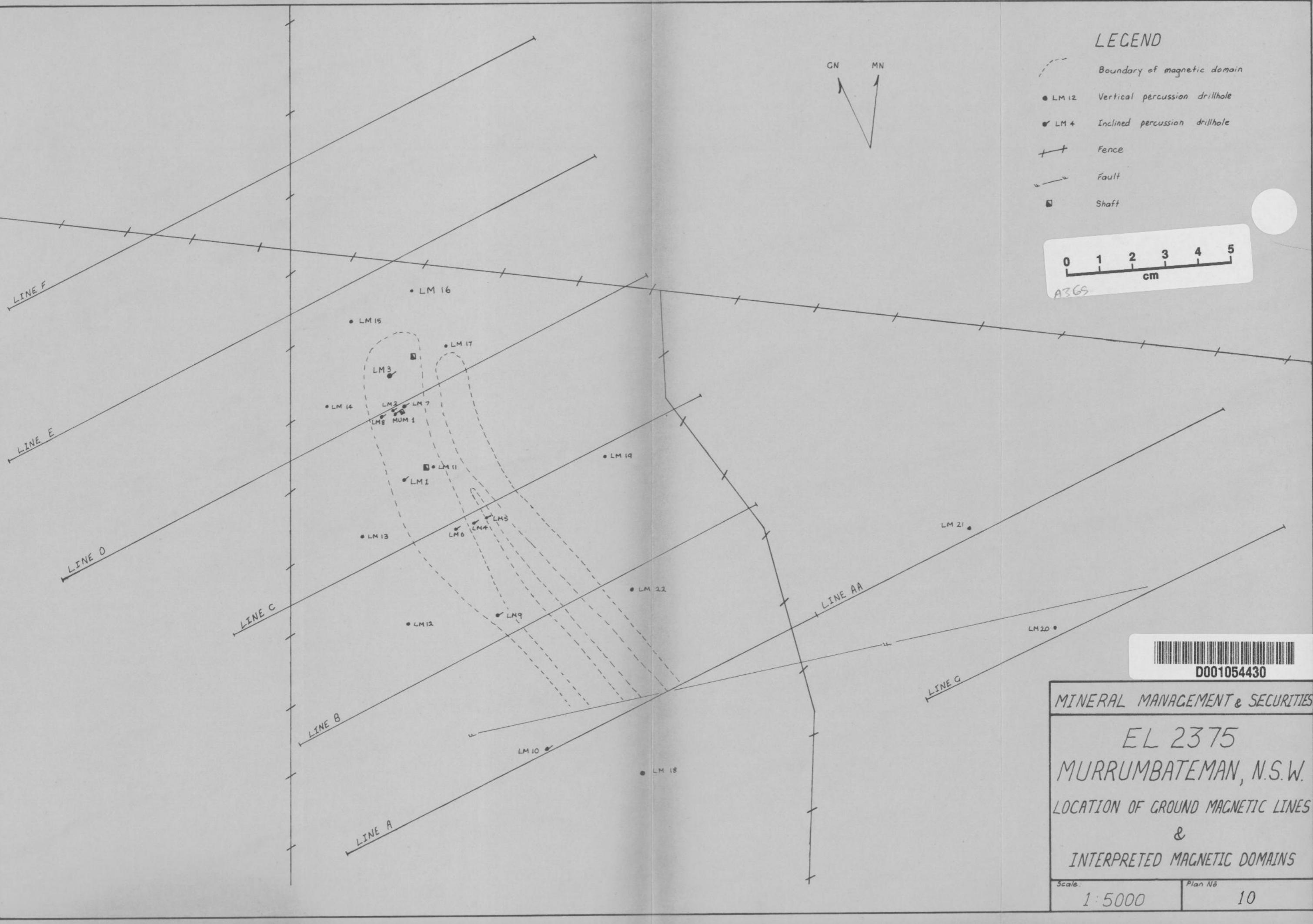
MINERAL MANAGEMENT & SECURITIES

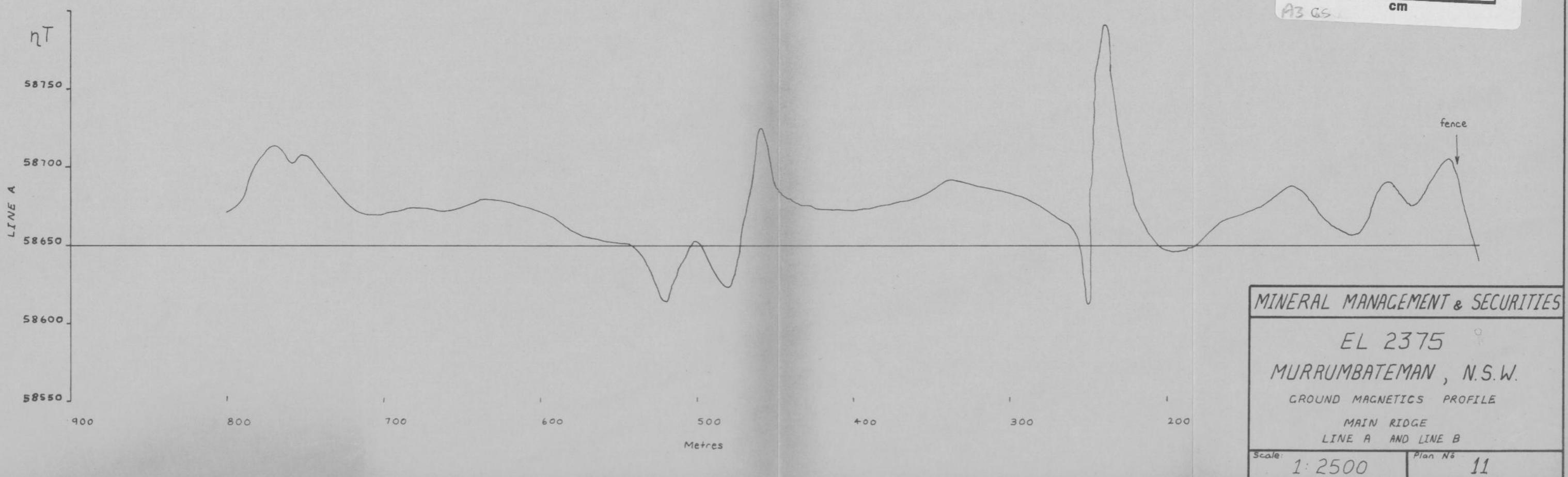
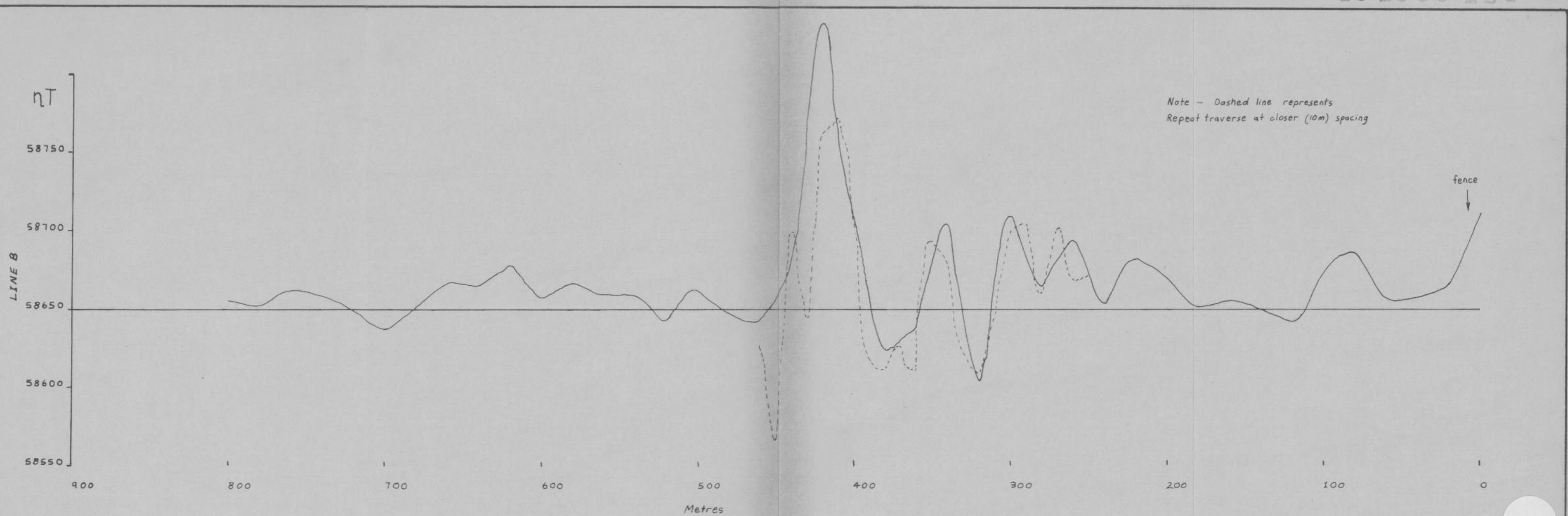
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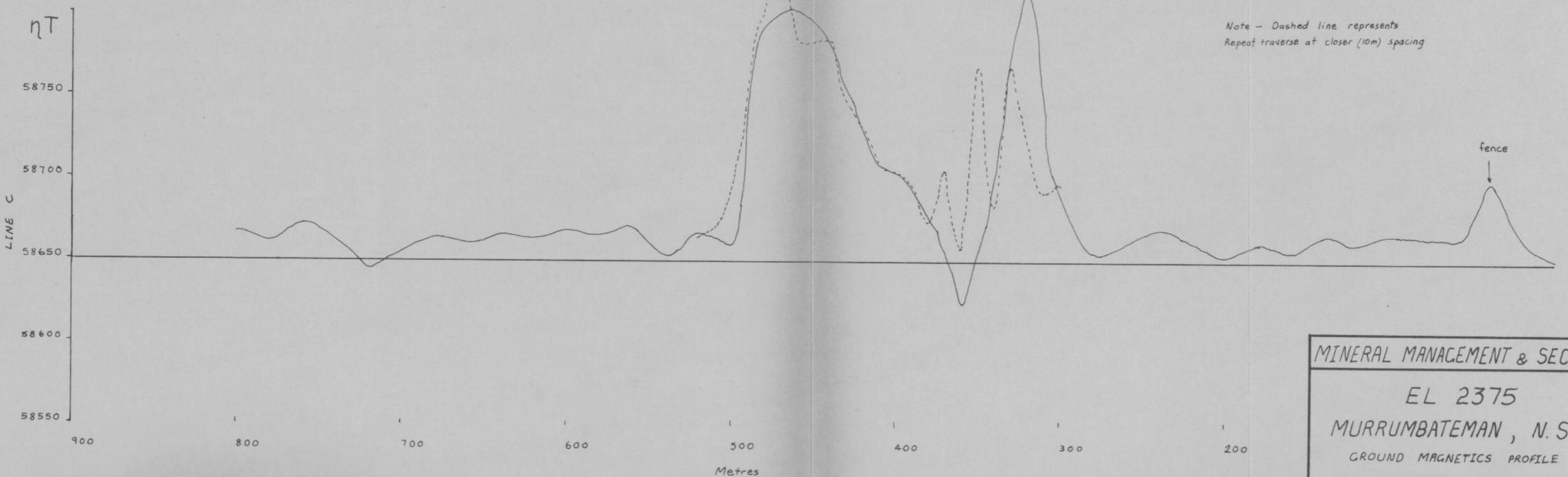
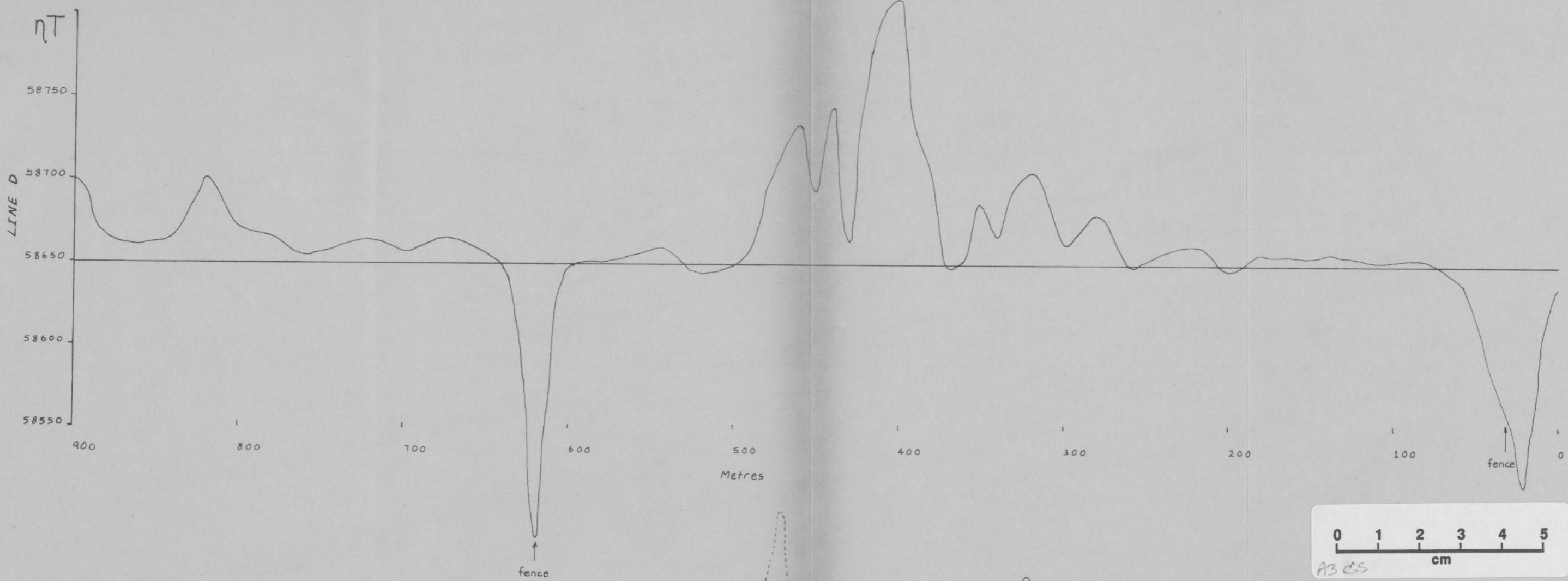
MURRUMBATEMAN, N.S.W.

*SECTION THROUGH LM 20 & LM 21
EASTERN RIDGE
Looking Grid East*

Scale: 1:1000 Plan No. 9

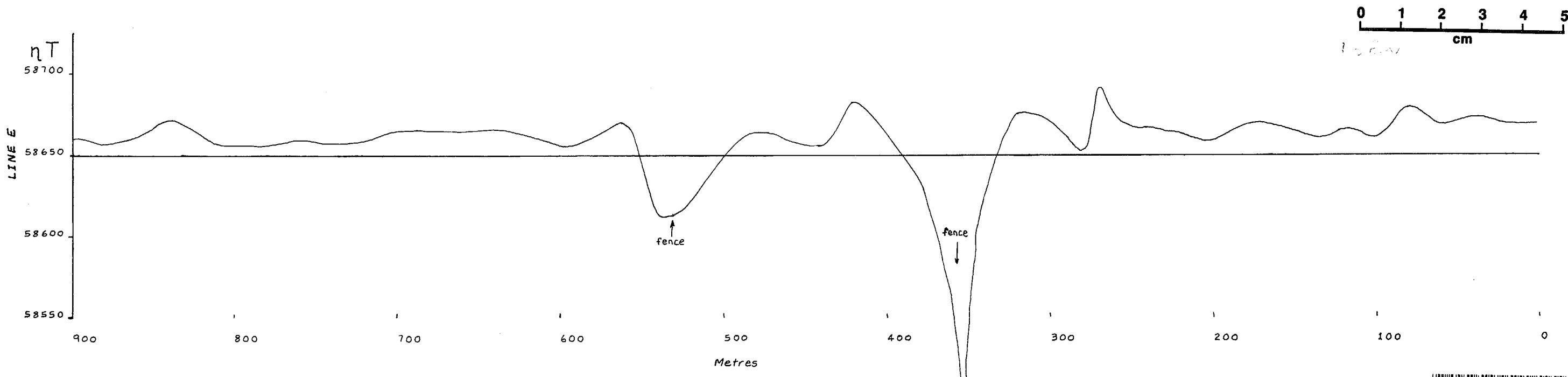
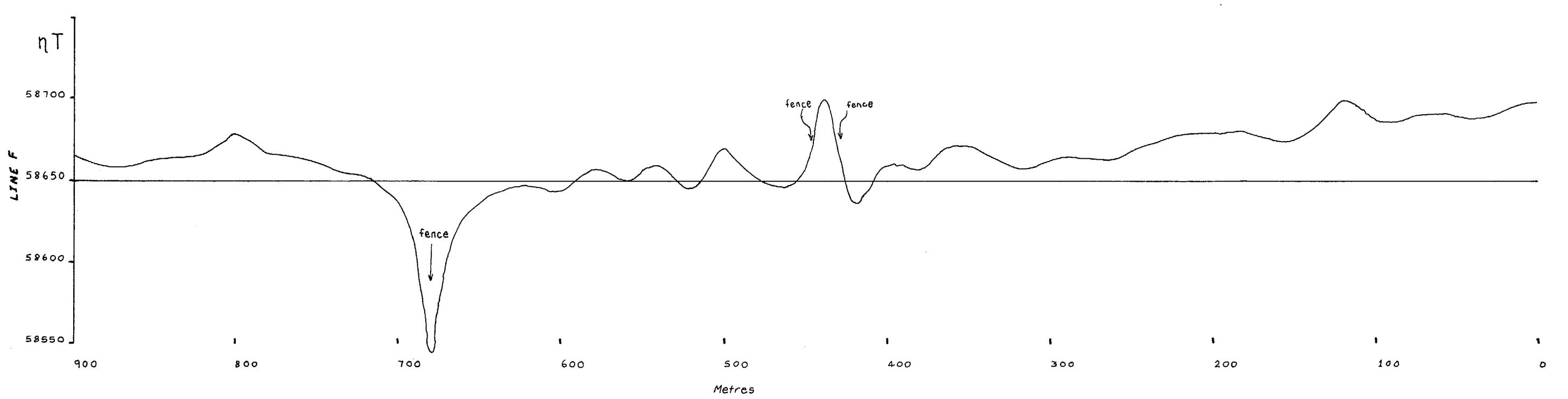






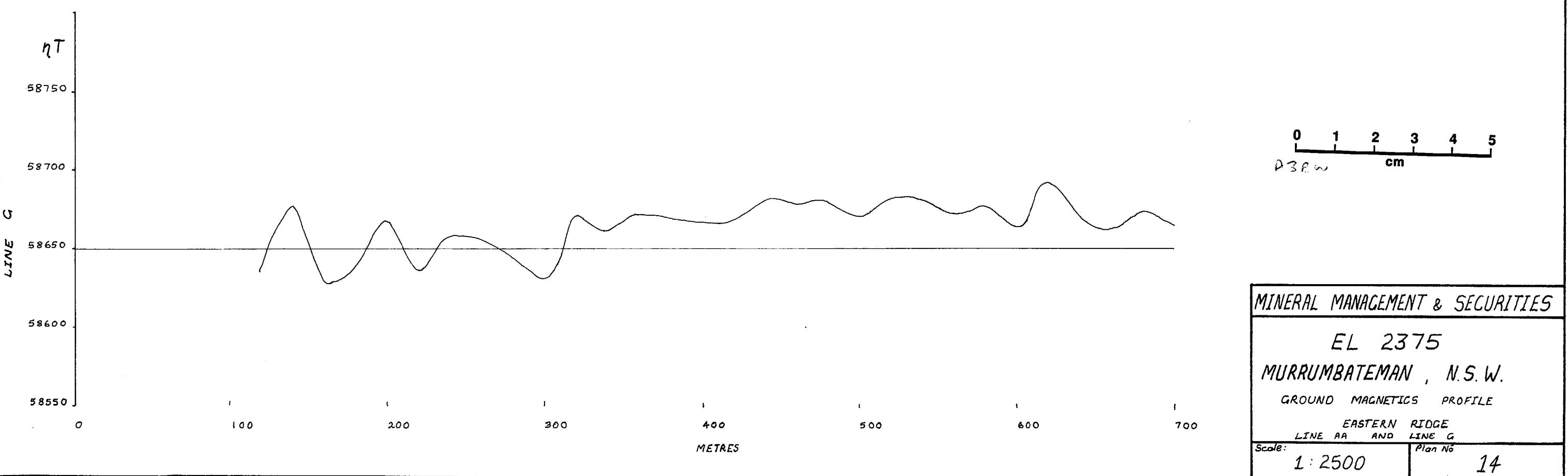
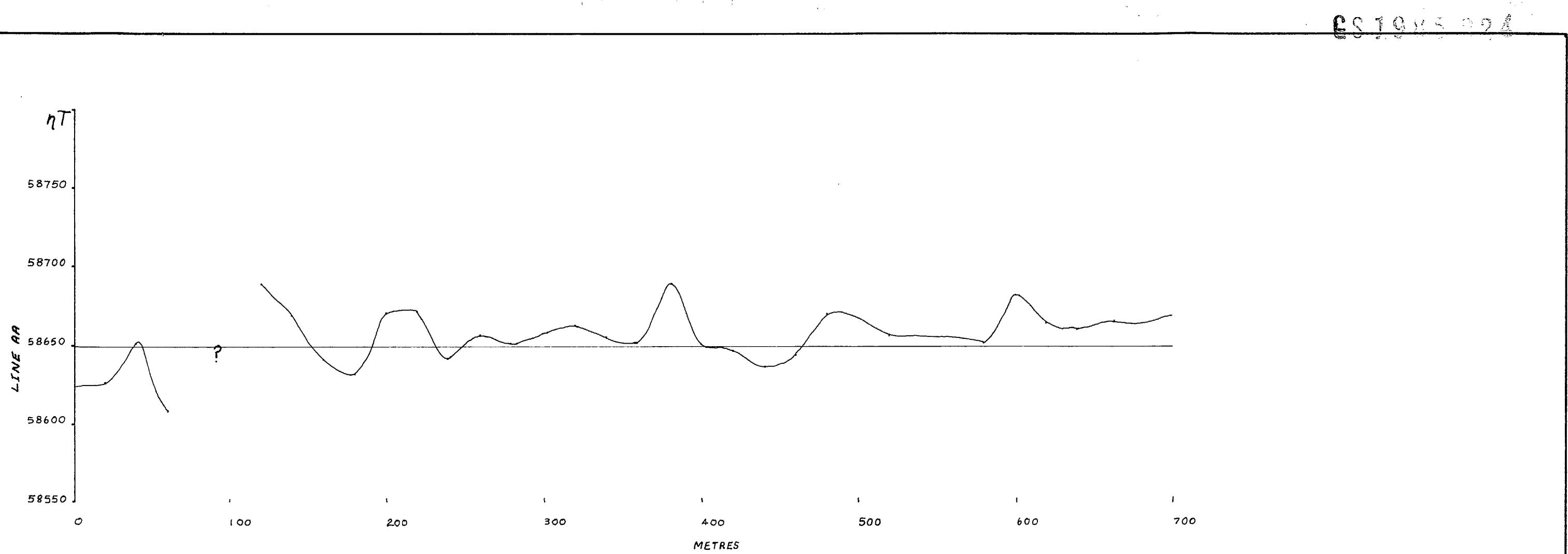
MINERAL MANAGEMENT & SECURITIES	
EL 2375	
MURRUMBATEMAN, N.S.W.	
GROUND MAGNETICS PROFILE	
MAIN RIDGE	
LINE C AND LINE D	
Scale:	1: 2500
Plan No	12

GS 1948 6/24



D001054440

MINERAL MANAGEMENT & SECURITIES	
EL 2375	
MURRUMBATEMAN, N.S.W.	
GROUND MAGNETICS PROFILE	
MAIN RIDGE	
LINE E AND LINE F	
Scale: 1: 2500	Plan No 13



D 38 cm
0 1 2 3 4 5
cm

MINERAL MANAGEMENT & SECURITIES	
EL 2375	
MURRUMBATEMAN, N.S.W.	
GROUND MAGNETICS PROFILE	
EASTERN RIDGE	
LINE AA AND LINE G	
Scale: 1: 2500	Plan No 14



LEGEND

3543 Sample number
(0.04) Au (ppm)
E0413 Ag (ppm)
BLD Below Level of Detection

- qbpp Quartz biotite porphyry
- qp Quartz porphyry
- qfbpp Quartz feldspar biotite porphyry
- qft Quartz feldspar tuff?
- /// silt Siltstone
- sst Sandstone
- w Weathered
- shaft Shaft

SCALE
0 200 400 METRES

MINERAL MANAGEMENT & SECURITIES		
MURRUMBATEMAN - EL 2375		
GEOLOGY & ROCK CHIP GOLD ASSAY RESULTS		
Date: August, 1985	Scale: 1:5000	PLAN 1

000105450

