48.4
48.5 /

FINAL REPORT E.L. 4373

12th September, 1983
to
10th September, 1987

Licensee:	Aberfoyle Exploration Pty. Ltd.
Operator:	Ashton Mining Limited
Sheet Reference:	Mt. Drummond (SE 53-12) 1:250,000
Submitted to:	Department of Mines & Energy

Ashton Mining Limited
444 Queen Street
Brisbane. 4000

December, 1987

ABSTRACT

During the period 12th September, 1983 to 10th September, 1987, Ashton Mining Limited as Manager of the A.D.E. Joint Venture carried out an exploration program in E.L. 4373 aimed at the location of kimberlite pipes.

Work undertaken included regional gravel and loam sampling, airborne magnetic and thematic mapper surveys, ground magnetics and follow-up loam sampling over potential magnetic targets.

Despite the fact that a small number of microdiamonds were recovered from the sampling, the exploration program failed to provide encouragement in locating the presence of a kimberlite pipe within the licence.

It was therefore decided that E.L. 4373 should be surrendered.

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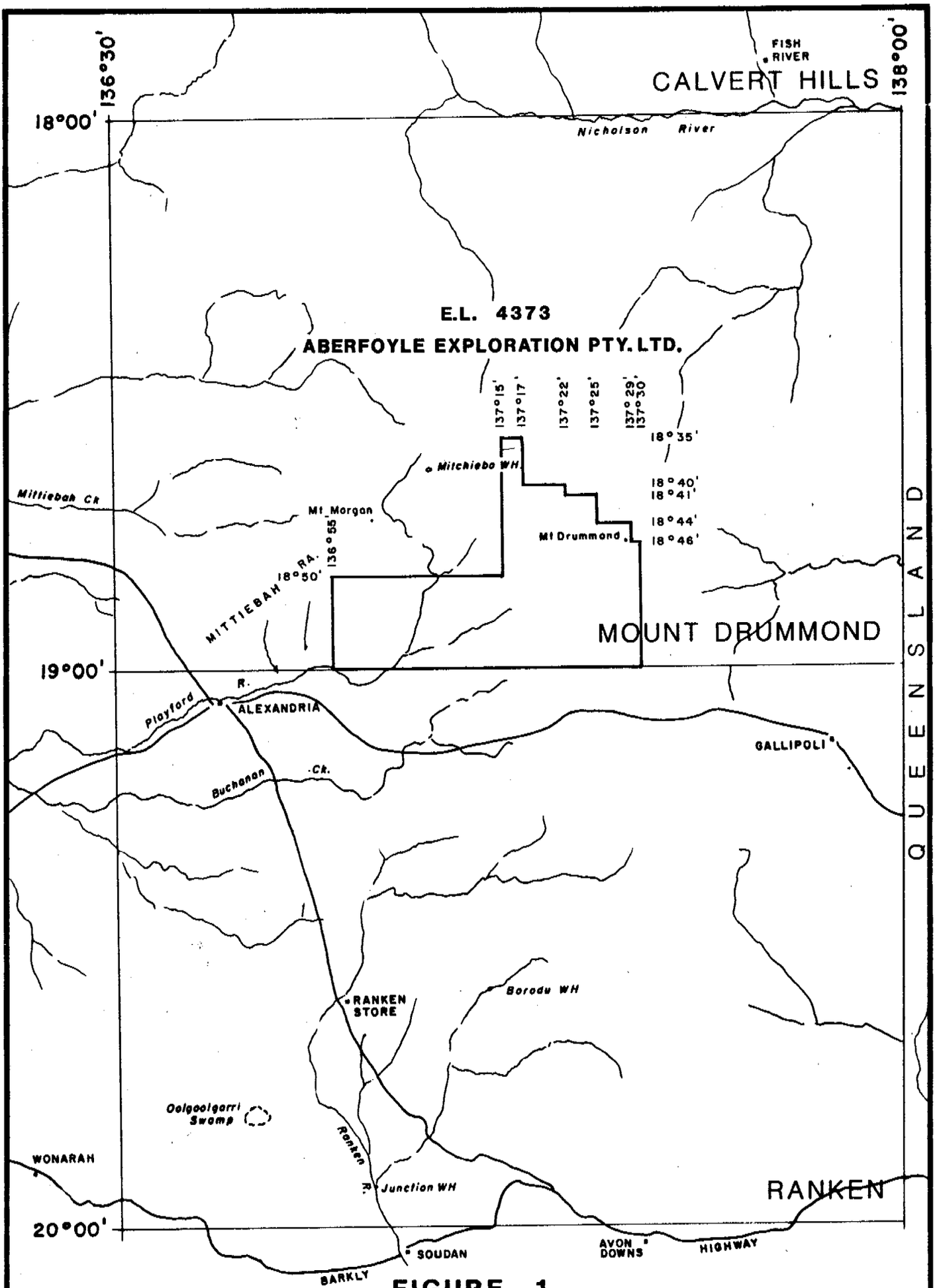


FIGURE 1

LOCATION MAP

A.D.E. JOINT VENTURE / ASHTON MINING LIMITED Scale 1:1 000 000 DECEMBER , 1987

1.00 INTRODUCTION

Exploration Licence 4373 covered an area of 1,562 square kilometres (485 blocks) on the Mount Drummond 1:250,000 sheet (refer to Figure 1).

The licence, which was granted to Aberfoyle Exploration Pty. Limited on 12th September, 1983, was held on behalf of the A.D.E. Joint Venture which, during tenure of E.L. 4373, comprised Ashton Mining Limited, A.O.G. Minerals Limited, Aberfoyle Exploration Pty. Limited and Australian Diamond Exploration N.L. Ashton Mining Limited was the Manager of the Joint Venture.

During tenure of the licence a program of regional gravel and loam sampling was undertaken. In addition two airborne surveys were conducted in the Mount Drummond region and included the entire licence area of E.L. 4373. The surveys were those of thematic mapping and airborne magnetics. Potential target areas defined by the airborne magnetic survey were subject to ground magnetic surveys and follow-up loam sampling.

This report gives a summary of the work carried out in E.L. 4373 during the period 12th September, 1983 to 10th September, 1987.

A statement of expenditure covering this period is included in the report.

2.00 REGIONAL SAMPLING PROGRAM

2.10 Field Phase

The gravel sampling program in E.L. 4373 was undertaken as part of a larger regional program in the Mount Drummond area.

Prior to the commencement of field work, gravel sample locations were plotted in the office on the Mittiebah and Mitchiebo 1:100,000 topographic map sheets so that sample sites tested the available drainage. As drainage in E.L. 4373 is relatively poorly developed, this resulted in only 22 gravel samples being taken within the licence. An additional 80 loam samples were collected in E.L. 4373 to help test the area.

During the field program, individual gravel sample sites were selected on the basis of the quality of the available heavy mineral traps in the vicinity of the preselected site, care being taken to sample the most suitable trap site. Helicopter was the most practical mode of transport as it had the advantage of ease of access and navigation and enabled the geologist to scan the area for suitable trap sites.

Once a suitable gravel sample site was located, approximately 40 kg of gravel were gathered, sieved and the minus 4mm fraction collected for laboratory examination.

Generally the minus 4mm samples weighed 30 to 35 kg. Loam samples, which are surface scrape samples usually weighed 15 to 20 kg.

All sample locations are given on Plan 1.

2.20 Laboratory Phase

The samples were processed at the Ashton Mining Limited laboratory in Perth where they were concentrated by Wilfley Table and heavy liquid separation techniques.

The heavy liquid used was tetrabromoethane with a specific gravity of 2.96. The concentrates were then screened into various size fractions, further concentrated, where required, by magnetic and electrostatic separation techniques and a comprehensive grain by grain examination carried out on the minus 1.0mm plus 0.4mm fractions.

Of the 102 samples collected within the licence, 96 contained no detectable kimberlite indicator minerals. The six remaining samples were each found to contain a single microdiamond.

A listing of laboratory results for all the samples is given in Appendix 1.

TABLE 1

SURVEY SPECIFICATIONS.

Instrument: Daedalus 1268 Scanner (11 channels)

Channels available:

Channel	Wave length (µm)
1	Ø.42 - Ø.45
2	Ø.45 - Ø.52
3	Ø.52 - Ø.6
4	Ø.6Ø5 - Ø.625
5	Ø.63 - Ø.69
6	Ø.695 - Ø.75
7	Ø.76 - Ø.9
8	Ø.91 - 1.Ø5
9	1.55 - 1.75
1Ø	2.Ø8 - 2.35
11	8.5 - 13

Aircraft: Beech King Air

Flying Altitude: 8ØØØ metres above ground level

Ground Element Size: 2Ømx 2Øm

Flight Times: Ø93Ø hours to 143Ø hours

Azimuth of Runs: North or South

Overlap between runs: 4Ø%

3.00 AIRBORNE THEMATIC MAPPER SURVEY

An airborne thematic mapper survey, undertaken on behalf of the A.D.E. Joint Venture by the National Safety Council of Australia, Victorian Division ("NSCA"), was flown over the whole of the licence area. Specifications for the survey are given in Table 1.

Thematic mapping was chosen over other remote sensing exploration methods as it had the advantage of using an eleven channel scanner giving a larger number of spectral bands which can be discriminated and because all data collected is digitized allowing for the greatest flexibility in manipulation of the data.

Within Exploration Licence 4373 the exploration method of thematic mapping was aimed primarily to enhance or distinguish between a possible kimberlite body and its surrounding overburden of undifferentiated Cainozoic black clayey soils, sand, sandy soils and lesser Middle Cambrian and Upper Proterozoic(?) sediments in the western sector of the licence.

The scanner data in the form of 'quick look paper prints' collected from the airborne thematic survey, together with all relevant aerial photography, was forwarded to Hunting Geology and Geophysics (Australia) Pty. Limited for examination.

LISTING OF ANOMALIES

The format used for the listing of anomalies is as follows:-

Anomaly Number	Grading	Map Ref.	Air Photo Number	Scanner Run & Channel No.	Description	Size

ABREVIATIONS

Grading
- H = high (highest priority)
- M = medium (definitely worth checking)
- L = low (probably worth checking)
- X = lowest (of low interest unless supported by additional data)

Map Ref
- Mbo = Mitchiebo
- Mit = Mittiebah

Air Photo Number
- MD = Mount Drummond

Description
- NSC = No stereo coverage

TABLE 2.

THEMATIC MAPPER ANOMALIES - E.L. 4373

217	X	Mbo	MD7/1878	R1Ø ch 6-8	Circular feature in colluvium; picked out by subtle vegetation differences. Not anomalous on air photo. 1.2 km.
218	X	Mbo		R1Ø ch 11	Diffuse thermal anomaly in sand over dark soil. 1 km.
22Ø	L	Mbo	MD8/1857	R1Ø ch 3-1Ø	Subcircular dark tonal anomaly. 45Øm.
229	L	Mbo	MD8/1855	R12 ch 3-11	Pale tonal anomaly in dark soil plain. 4ØØm.

TABLE 2.

THEMATIC MAPPER ANOMALIES - E.L. 4373

232	L	Mbo	MD6/1921 R11 ch 4-8	Small circular depression. 400m.
246	X	Mbo	MD6/1920 R13 ch 11	Indistinct thermal anomaly on NNW linear. Not anomalous on air photo. 250m.
258	L	Mbo	MD8/1853	Subcircular embayment in edge of residual surface; has a slight tonal anomaly. 700 x 800m.
259	L	Mbo	MD8/1853 R16 ch 1-10	Indistinct elliptical feature; clearer on scanner data. 350 x 800m.
260	X	Mbo	MD8/1853 R15 ch 1-2, 6-11	Elliptical feature in tonal anomaly. Less distinct on scanner data. 200 x 300m.
291	M	Mbo	MD8/1853 R16 ch 1-11	Small dark tonal anomaly. Appears slightly larger on thermal channel. On air photo seen as patch of softer material in slight depression in harder residual surface. 250m.
295	X	Mbo	MD8/1853 R16 ch 3-10	Dark tonal anomaly on E-W fracture. Not anomalous on air photo. 250m.
317	X	Mit	MD8/1851 R17 ch 1-11	Circular feature in dissected residual surface. Appears to be patch of cemented gravel in drainage. 300m.
318	L	Mit	MD8/1851	Faint circular on pediment slope. 850m.
334	X	Mbo	MD8/1851 R17 ch 3-8	Small topo anomaly on major NNW linear. Not anomalous on air photo. 100m.

The procedure used by Hunting in such an examination is listed below:

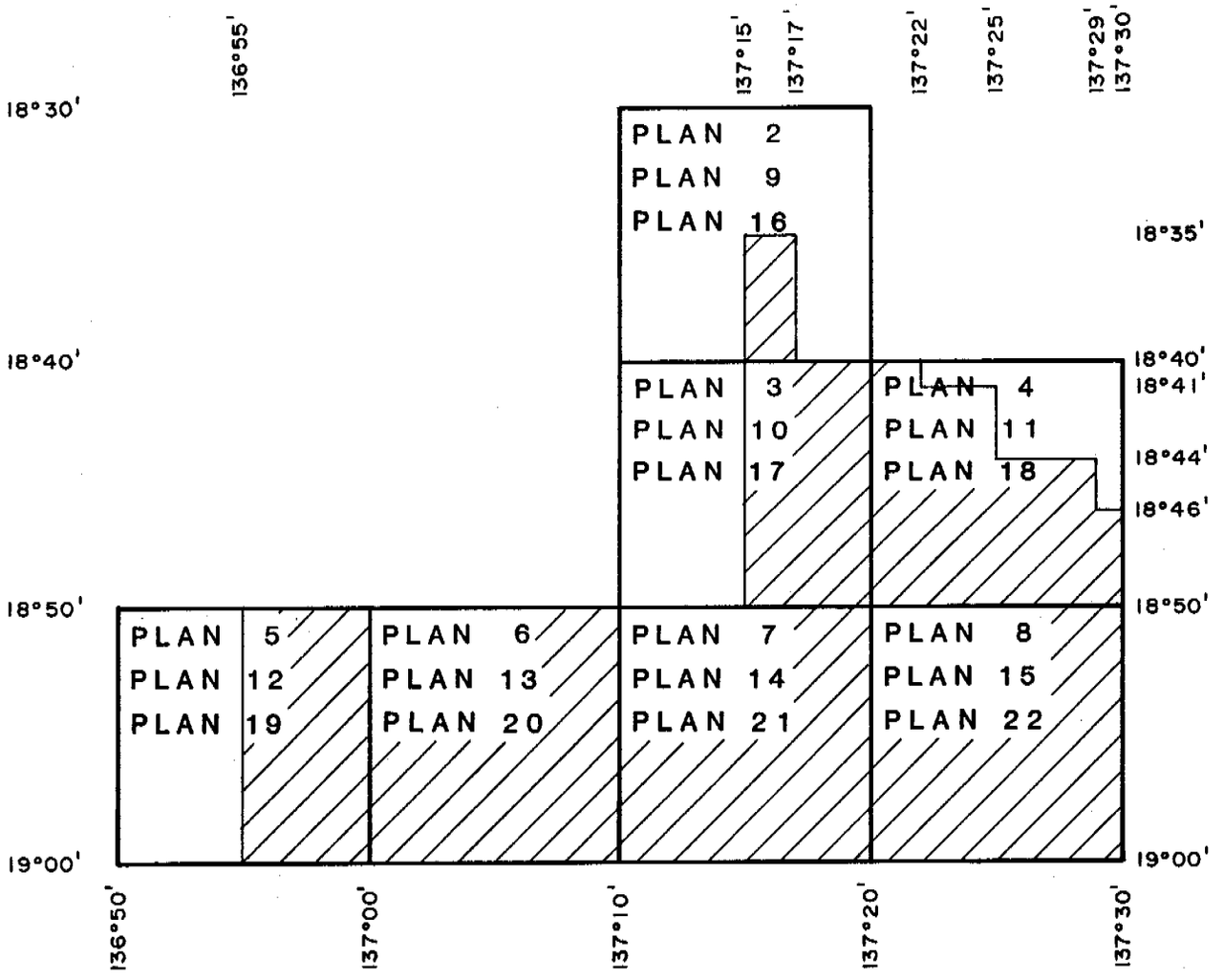
1. Monoscopic examination of aerial photography.
2. Identification of anomalies from Step 1 on scanner data.
3. Examination of 11 channels of scanner data.
4. Identification of additional anomalies from Step 3 on aerial photography.
5. Stereoscopic examination of all anomalies on aerial photography where stereoscopic coverage was available.
6. Grading of anomalies.

The targets selected by Hunting were rated on a lowest, low, medium or high priority scale. Grading was established solely on the appearance of the anomalous zones without consideration of their position in regard to regional tectonic structures, or their apparent age in relation to residual surfaces.

Within E.L. 4373 seven lowest, six low and one medium priority thematic target were outlined, details of these being listed in Table 2. Anomaly locations are given in Plan 1.

E.L. 4373

ABERFOYLE EXPLORATION PTY. LTD.



Top number ..... Residual Magnetic Profiles

Centre number ..... Flight Path

Lower number ..... Residual Magnetic Intensity

..... Area of exploration licence

FIGURE 2

AIRBORNE MAGNETIC SURVEY

PLAN LOCATION

A.D.E. JOINT VENTURE / ASHTON MINING LIMITED

DECEMBER , 1987

4.00 AIRBORNE MAGNETIC SURVEY

4.10 General

A fixed wing airborne magnetic survey was flown by Austirex International Limited over the whole of the licence. Refer to Figure 2 for plan locations.

The work was carried out as part of a larger regional airborne magnetic program by the A.D.E. Joint Venture in the Mount Drummond area. Flight line spacing was 300 metres with lines oriented in a north-south direction. Additional survey specifications are listed in the legend of all airborne magnetic plans.

Results within E.L. 4373 are presented as residual magnetic profiles, flight path and residual magnetic intensity plans submitted in Annual Report E.L. 4373 12th September, 1984 to 11th September, 1985.

4.20 Interpretation and Follow-up

The data collected from the survey was interpreted by Ashton Mining geologists and a number of potential target areas were selected for further investigation. Anomalies were chosen from the stacked magnetic profiles and priority was attached to those discrete anomalies which could not be readily accounted for by the available geology. The position of the anomaly in relation to major structural features was also noted.

Selected targets were subject to field inspection and, where appropriate, ground magnetic surveys. Results of such surveys within E.L. 4373 are presented as magnetic profiles and contoured plans (refer to Figures 3 to 5). Follow-up loam sampling programs were conducted over two of these potential target areas. In addition one gravel sample was collected to help test the anomalous area.

All sample locations are given on Plan 1.

3.30 Laboratory Results

All samples collected during such follow-up sampling stages were forwarded to Ashton Mining's laboratory in Perth where they were processed and observed in the manner outlined in Section 2.20.

Of the 21 follow-up samples collected within the licence, 18 contained no detectable kimberlite indicator minerals. The remaining three samples were each found to contain a single microdiamond. In addition one garnet was identified through laboratory examination but was considered to be of non-kimberlitic origin.

A listing of the laboratory results of all samples is given in Appendix 1.

5.00 CONCLUSIONS

During the period that Exploration Licence 4373 was explored by the A.D.E. Joint Venture a variety of techniques including classical gravel sampling, loam sampling, airborne magnetic and thematic mapper surveys and ground magnetics were applied in the search for kimberlites.

Despite the fact that a number of gravel and loam samples were found to contain a microdiamond, the exploration program failed to provide encouragement in locating the presence of a kimberlite pipe within the licence.

It was therefore decided by the Joint Venture that exploration efforts should be concentrated in more promising ground held elsewhere in the Territory. Consequently E.L. 4373 was surrendered with effect from 11th September, 1987.

APPENDIX 1.

RESULTS OF LABORATORY EXAMINATIONS

GRAVEL AND LOAM SAMPLES EL 4373

The following fractions of each sample were studied:

-1.0 mm	+0.8 mm;	denoted by +0.8
-0.8 mm	+0.5 mm;	denoted by +0.5
-0.5 mm	+0.4 mm;	denoted by +0.4

Sample No	Results	Comments
MDR 2	Nil	
MDR 3	Nil	
MDR 105	1 -0.4 DIAMOND	1 +0.15 x 0.15 STONE turbid fragment, part of a pink-brown cube with sugary surfaces.
MDR 106	1 -0.4 DIAMOND	1 +0.18 x 0.15 STONE pale pinkish brown, hackly cube, sugary, subtranslucent.
MDR 107	1 -0.4 DIAMOND	1 +0.2 x 0.15 STONE clear, colourless, subrounded, complex shape, related to dodecahedral type.
MDR 108	Nil	
MDR 109	Nil	
MDR 110	Nil	
MDR 111	Nil	
MDR 112	1 -0.4 DIAMOND	1 +0.25 x 0.25 x 0.15 STONE irregular, anhedral, many surfaces, white, frosted, grooved.

Sample No	Results	Comments
MDR 113	Nil	
MDR 114	Nil	
MDR 115	Nil	
MDR 116	Nil	
MDR 117	Nil	
MDR 118	Nil	
MDR 119	Nil	
MDR 120	Nil	
MDR 121	Nil	
MDR 142	Nil	
MDR 143	Nil	
MDR 144	Nil	
MDR 302	Nil	
MDR 303	Nil	
MDR 304	Nil	
MDR 305	Nil	
MDR 306	1 -0.4 DIAMOND	1 +0.2 x 0.15 STONE pale yellow cube, distorted, finely textured curved faces, subtranslucent.
MDR 307	Nil	

Sample No	Results	Comments
MDR 308	Nil	
MDR 309	Nil	
MDR 310	Nil	
MDR 311	Nil	
MDR 312	Nil	
MDR 313	Nil	
MDR 314	Nil	
MDR 315	Nil	
MDR 316	Nil	
MDR 317	Nil	
MDR 318	Nil	
MDR 319	Nil	
MDR 320	Nil	
MDR 321	Nil	
MDR 322	Nil	
MDR 323	Nil	
MDR 324	Nil	
MDR 325	Nil	
MDR 326	Nil	

Sample No	Results	Comments
MDR 327	Nil	
MDR 328	Nil	
MDR 329	Nil	
MDR 330	Nil	
MDR 331	Nil	
MDR 332	Nil	
MDR 333	Nil	
MDR 334	Nil	
MDR 335	Nil	
MDR 336	1 -0.4 DIAMOND	1 +0.15 x 0.15 STONE grey, turbid, part of a cube with rounded corners, poor quality.
MDR 337	Nil	
MDR 338	Nil	
MDR 339	Nil	
MDR 340	Nil	
MDR 341	Nil	
MDR 650	Nil	
MDR 651	Nil	
MDR 652	Nil	

Sample No	Results	Comments
MDR 653	Nil	
MDR 654	Nil	
MDR 655	Nil	
MDR 656	Nil	
MDR 657	Nil	
MDR 658	Nil	
MDR 659	Nil	
MDR 660	Nil	
MDR 661	Nil	
MDR 662	Nil	
MDR 663	Nil	
MDR 664	Nil	
MDR 665	Nil	
MDR 666	Nil	
MDR 667	Nil	
MDR 668	Nil	
MDR 669	Nil	
MDR 670	Nil	

Sample No	Results	Comments
MDR 671	Nil	
MDR 672	Nil	
MDR 673	Nil	
MDR 674	Nil	
MDR 675	Nil	
MDR 676	Nil	
MDR 677	Nil	
MDR 678	Nil	
MDR 679	Nil	
MDR 680	Nil	
MDR 681	Nil	
MDR 682	Nil	
MDR 683	Nil	
MDR 684	Nil	
MDR 685	Nil	
MDR 686	Nil	
MDR 687	Nil	
MDR 688	Nil	
MDR 689	Nil	

Sample No	Results	Comments
MDR 810	Nil	
MDR 811	Nil	
MDR 812	Nil	
MDR 813	Nil	
MDR 814	1 -Ø.4 DIAMOND	1 +Ø.12 x Ø.12 x Ø.12 STONE well formed dodecahedron, weak pink colour.
MDR 815	Nil	
MDR 816	Nil	
MDR 817	Nil	
MDR 818	1 -Ø.4 DIAMOND	1 +Ø.2Ø x Ø.2Ø x Ø.18 STONE very irregular, turbid, pink. Aggregate of cubes.
MDR 819	Nil	
MDR 851	Nil	
MDR 881	Nil	
MDR 882	Nil	
MDR 883	Nil	
MDR 884	Nil	
MDR 885	1 -Ø.4 DIAMOND	1 +Ø.16 x Ø.16 x Ø.16 STONE brown, opaque cube. Resorbed corners and one part bevelled off by resorption. One brown radiation damage spot. 1 +Ø.5 GARNET orange, anhedral with chemically etched surfaces. Not of interest.

Sample No	Results	Comments
MDR 886	Nil	
MDR 887	Nil	
MDR 888	Nil	
MDR 889	Nil	
MDR 890	Nil	

APPENDIX 2.

A.D.E. JOINT VENTURE

EXPLORATION LICENCE NO. 4373

FINAL EXPENDITURE FOR THE PERIOD 12.9.83 TO 10.9.87

	$
Salaries	12,644
Field & Laboratory Expenses	78,259
Miscellaneous	13,174
Expenditure for period:	$104,077

LEGEND

•	Gravel sample
+	Loam sample
x	Rock sample
123	Sample for period ending 11.9.1984
456	Sample for period ending 11.9.1985
○MC6/3	Airborne magnetic anomaly

THEMATIC MAPPER ANOMALY

○	Approximate size and shape of anomaly
342	Anomaly number
***	Anomaly grading - high
**	- medium
*	- low
	- lowest
pa	Position approximate
———	Fracture or other linear feature
— — —	Weak linear
⌇⌇⌇⌇⌇	Ridge
—○—	Dyke

137°15' 137°17'
18°35' 18°35'
246
137°22'
18°40'
137°25'
18°41'
MDR670 MDR671 MDR672 MDR673 MDR674 MDR675 MDR676 MDR677 MDR678 MDR679
MDR680 MDR681 MDR682 MDR683 MDR684 MDR685 MDR686 MDR687 MDR688 MDR689
232 *
137°29'
18°44'
MDR851
MDR144
MC6/5
MDR810 MDR811 MDR812 MDR813 MDR814 MDR815 MDR816 MDR817 MDR818 MDR819
217
137°30'
18°46'
MC6/2
MDR142
MC6/3
MDR881 MDR882 MDR883 MDR884 MDR885 MDR886 MDR887 MDR888 MDR889 MDR890
MDR143
MDR660 MDR661 MDR662 MDR663 MDR664 MDR665 MDR667 MDR668 MDR669
MC6/1
136°55'
18°50'
EL 4373 : ABERFOYLE
MDR105
MDR106
MDR107
MB9/5
MDR119
317
318 *
334
258 *
MDR108
MDR109
MDR120
MDR121
295
MDR002
MDR118
MDR003
RIVER
MDR110
MDR113
MDR116
MDR117
259 *
291 **
260
MDR112
PLATYPUS
MB9/2
MDR114
MDR111
MB9/1
MDR115
MDR650 MDR651 MDR652 MDR653 MDR654 MDR655 MDR656 MDR657 MDR658 MDR659
MDR322 MDR323 MDR324 MDR325 MDR326 MDR327 MDR328 MDR329 MDR330 MDR331 MDR332 MDR333 MDR334 MDR335 MDR336 MDR337 MDR338 MDR339 MDR340 MDR341
337-341 +
+332-336 *
229
327-331 +
322-326 +
302-306 +
307-311 +
312-316 +
317-321 +
MDR302 MDR303 MDR304 MDR305 MDR306 MDR307 MDR308 MDR309 MDR310 MDR311 MDR312 MDR313 MDR314 MDR315 MDR316 MDR317 MDR318 MDR319 MDR320 MDR321
218 pa
220 * pa
19°00'
136°55'
137°30'
19°00'

ABERFOYLE EXPLORATION PTY. LTD.
A.D.E. JOINT VENTURE
E.L. 4373
ANOMALY AND SAMPLE LOCATIONS
PLAN 1
0 1 2 3 4 5 KM
Scale 1:100 000
ASHTON MINING LIMITED DECEMBER, 1987

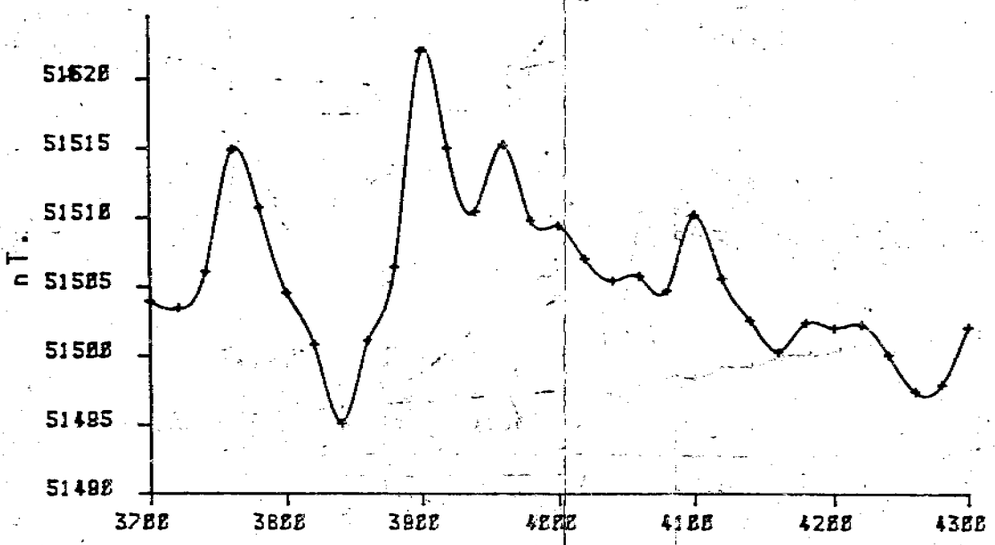
GR 88/224A

GR88/224 (1)

ANOMALY MC6/2 MITCHIEBO

FIGURE 3

DECEMBER, 1987



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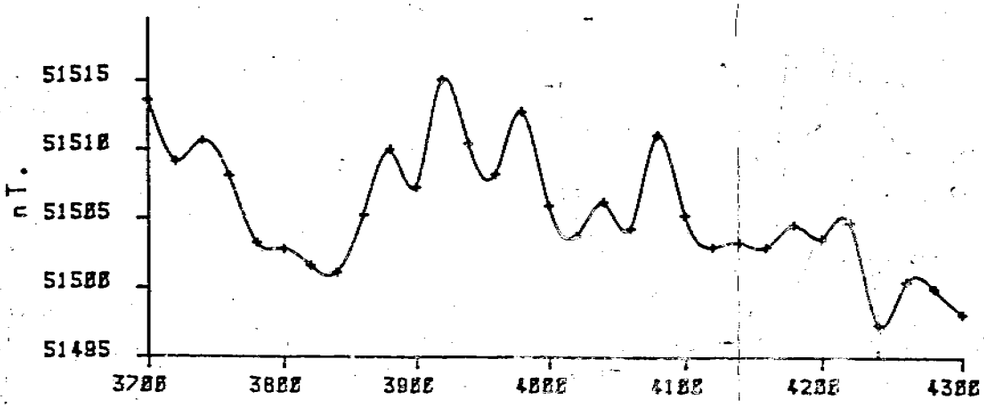

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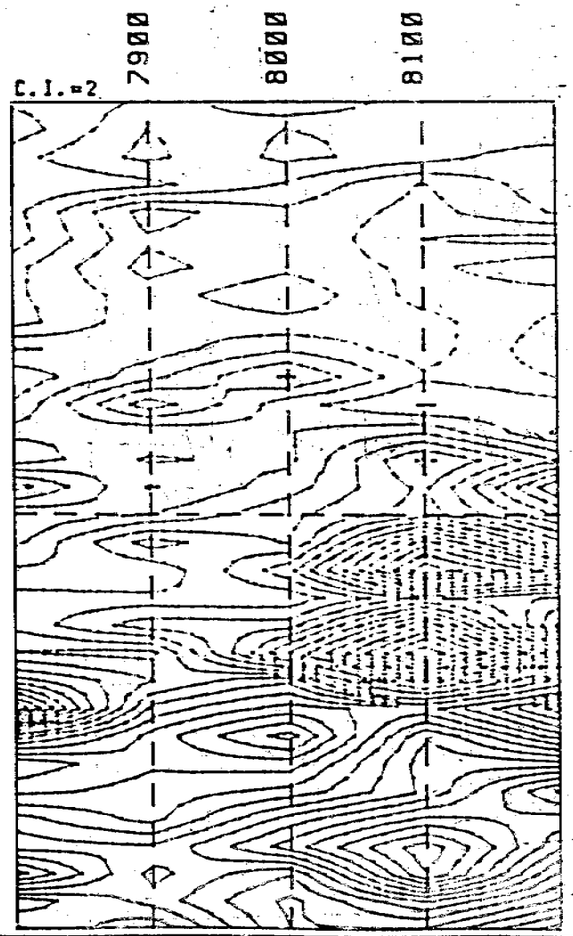
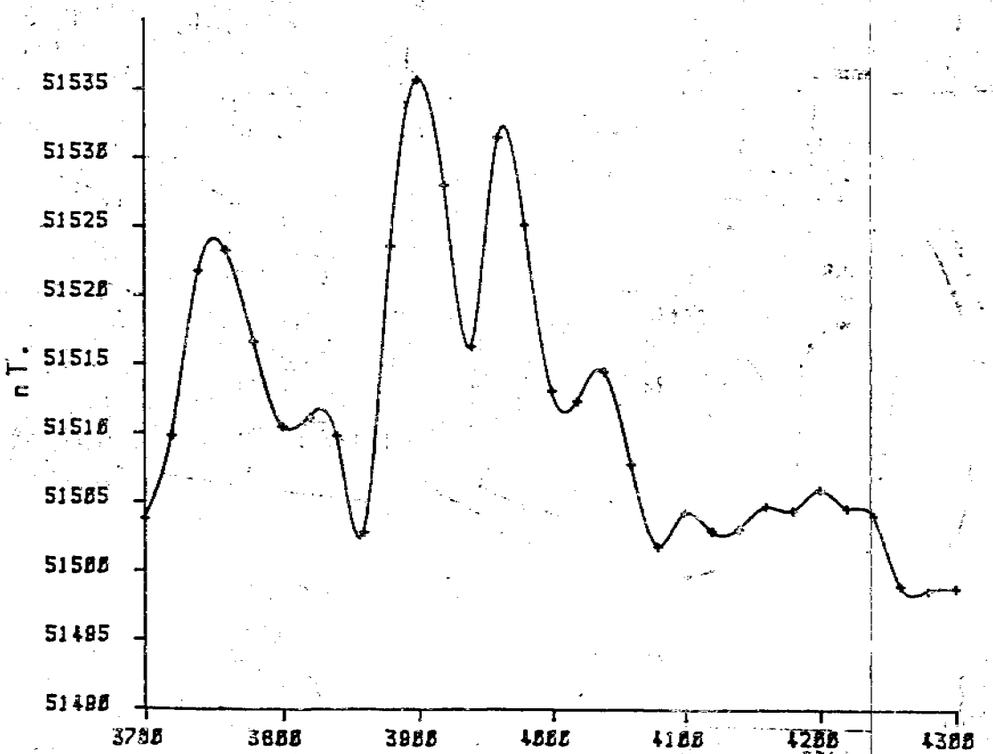




ANOMALY MC6/2 MITCHIEBO

LINE 8100.0 SCALE 1: 5000.0

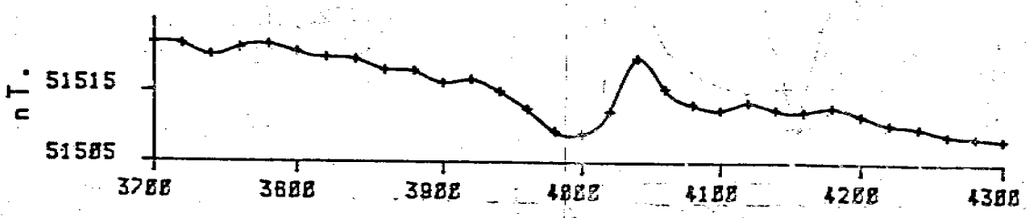
GR88/224-D

ANOMALY MC6/3 MITCHIEBO

x= Sample locations MDR 881-890

FIGURE 4

DECEMBER, 1987



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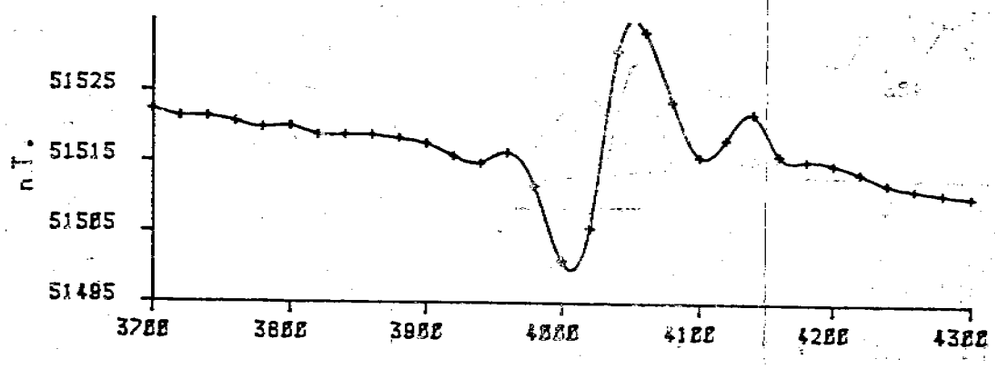

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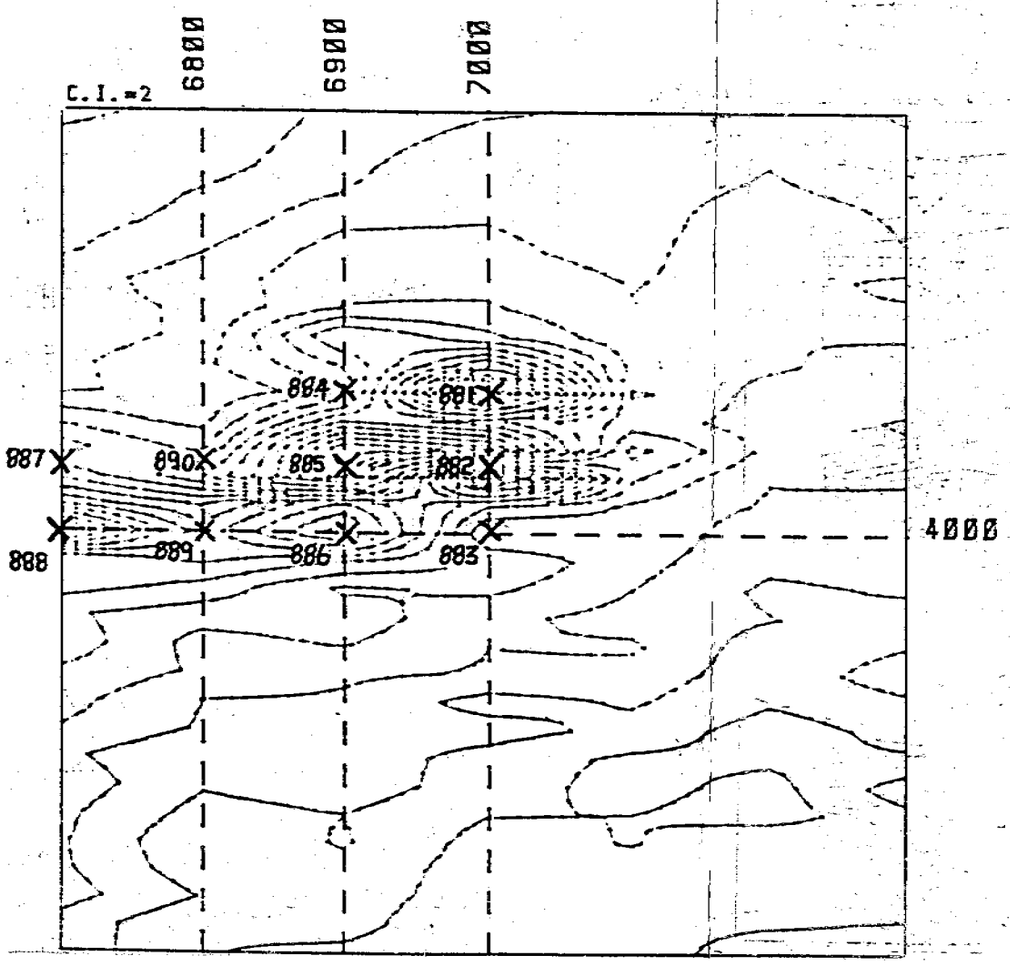

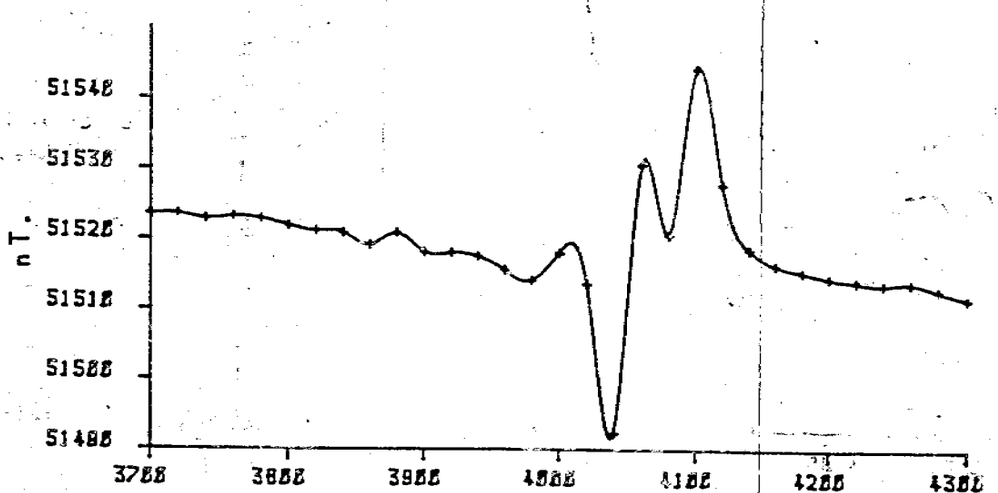

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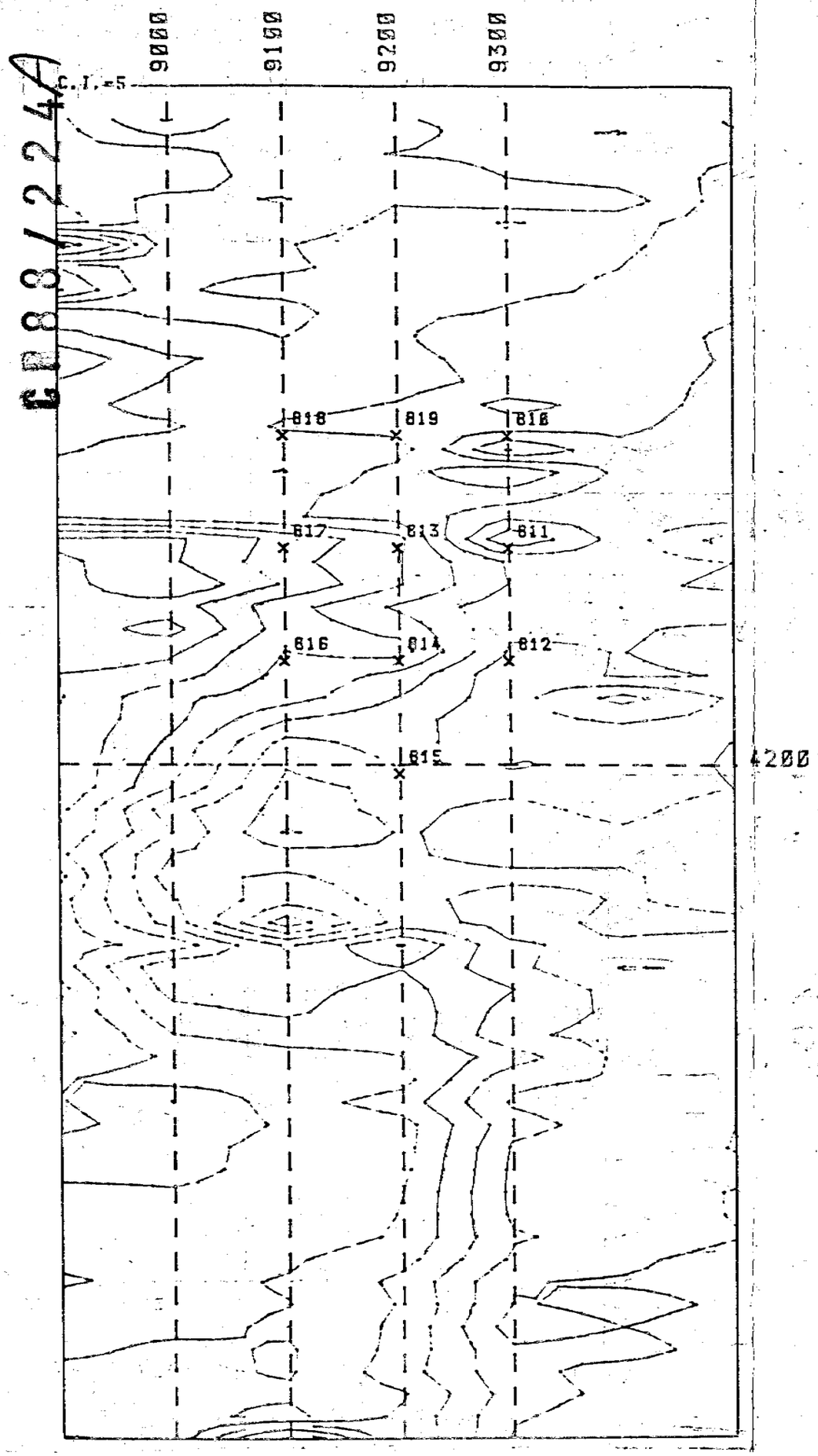
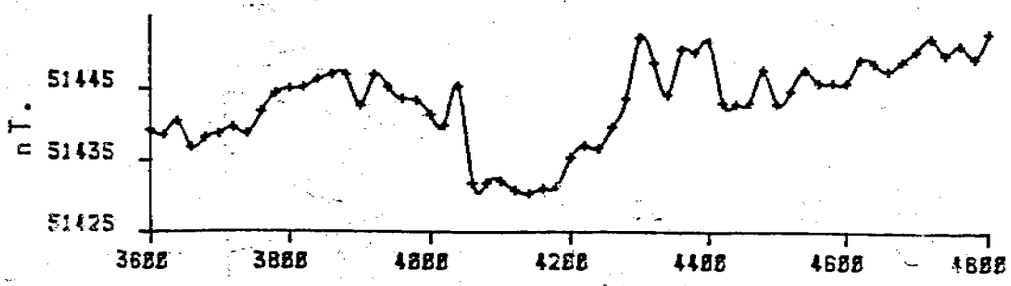


ANOMALY MC6/5 MITCHIEBO

[Note profiles half scale of contour plot.]

FIGURE 5
DECEMBER, 1987

×= Sample locations MDR 810-819



ANOMALY MC6/5 MITCHIEBO
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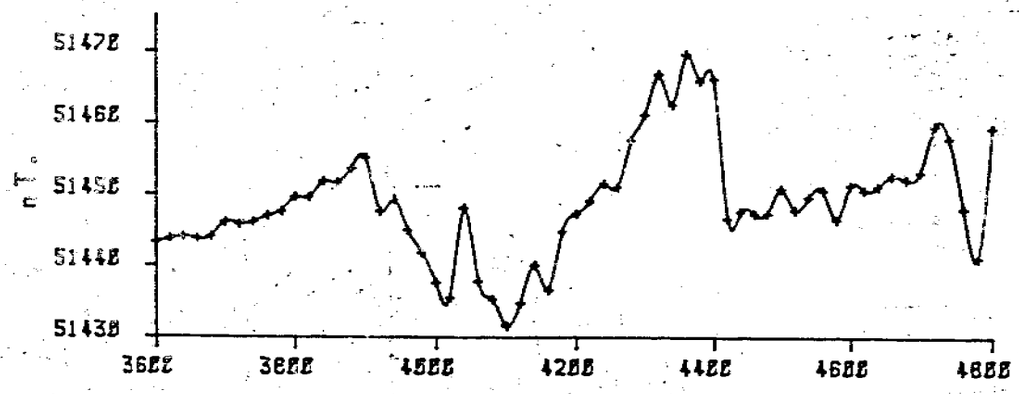

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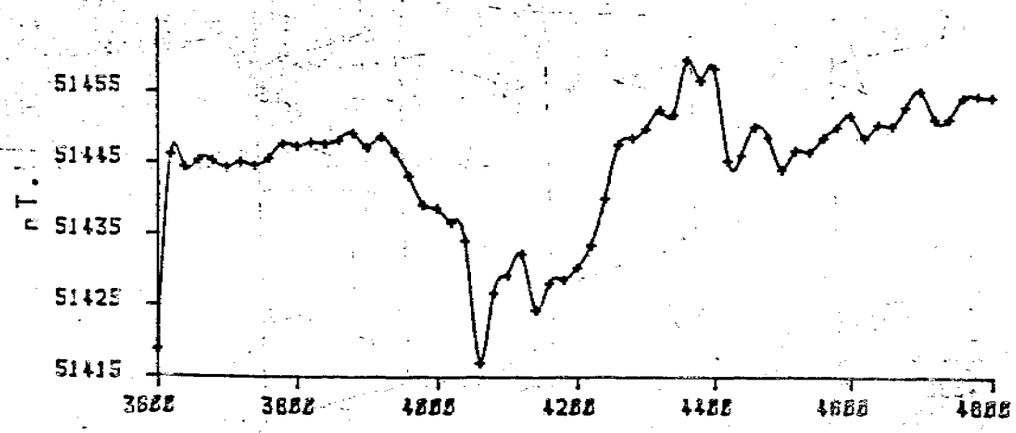

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