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ANNUAL REPORT E.L. 4361
30th November, 1984
to
29th November, 1985
Volume 1: Text, Plan 1 & Figures

Licensee: Ashton Mining Limited
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, 1985
ABSTRACT

During the period 30th November, 1984 to 29th November, 1985, Ashton Mining Limited on behalf of the A.D.E. Joint Venture carried out an exploration program in E.L. 4361 aimed at the location of kimberlite pipes.

Work undertaken included an airborne thematic mapper survey, airborne and ground magnetics, follow-up loam sampling and diamond drilling of five selected high priority magnetic anomalies within the licence.

A number of targets remain which will require further testing during the next field program.
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FIGURE 1
LOCATION MAP

A.D.E. JOINT VENTURE / ASHTON MINING LIMITED  Scale 1:1,000,000  Date  DECEMBER, 1985
1.00 INTRODUCTION

Exploration Licence 4361 covers an area of 1,610 square kilometres (500 blocks) on the Mount Drummond 1:250,000 sheet (refer to Figure 1).

The licence, which was granted to Plenty River Mining Company (N.T.) Limited on 30th November, 1983, is subject to an option agreement with the A.D.E. Joint Venture partners, Ashton Mining Limited, A.O.G. Minerals Limited and Aberfoyle Exploration Pty. Limited. The title was later transferred to Ashton Mining Limited, the transfer being approved by the Department of Mines and Energy on 9th April, 1984.

During the second year of tenure of the licence, two airborne surveys were conducted in the Mount Drummond region and included the entire licence area of E.L. 4361. The surveys were that of thematic mapping and airborne magnetics. Potential target areas defined by the airborne magnetic survey were subject to ground magnetic surveys, selective loam sampling and diamond drilling.

This report gives a summary of the work carried out in E.L. 4361 during the period 30th November, 1984 to 29th November, 1985.

A statement of expenditure covering this period is included in the report.
### TABLE 1

**SURVEY SPECIFICATIONS.**

**Instrument:** Daedalus 1268 Scanner (11 channels)

<table>
<thead>
<tr>
<th>Channels available:</th>
<th>Channel</th>
<th>Wave length (μm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0.42 - 0.45</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.45 - 0.52</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.52 - 0.6</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0.605 - 0.625</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0.63 - 0.69</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>0.695 - 0.75</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>0.76 - 0.9</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>0.91 - 1.05</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>1.55 - 1.75</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>2.08 - 2.35</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>8.5 - 13</td>
</tr>
</tbody>
</table>

**Aircraft:** Beech King Air

**Flying Altitude:** 8000 metres above ground level

**Ground Element Size:** 20m x 20m

**Flight Times:** 0930 hours to 1430 hours

**Azimuth of Runs:** North or South

**Overlap between runs:** 40%
2.  

2.00 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 4361 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 sands and soil, lesser Upper(?) Proterozoic sediments of the South Nicholson Group and minor Lower Proterozoic sediments, metasediments and volcanics in the northern 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. Number Air Photo 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
Ben = Benmara
Box = Boxer

Air Photo Number
MD = Mount Drummond

Description
NSC = No stereo coverage

TABLE 2.

THEMATIC MAPPER ANOMALIES - E.L. 4361

239 X Ben MD4/1976 RL4 ch 1-11 Circular feature; indistinct on scanner data. No stereo anomaly. 700m.

240 X Ben MD3/1981 RL4 ch 5-8 Vague circular at junction of NW and NNW linears. Indistinct on scanner data. 800m.

241 X Ben MD2/2004 RL4 ch 1-10 Part circular feature with sand ridges. Not anomalous in stereo. 2km.
### TABLE 2.

**THEMATIC MAPPER ANOMALIES – E.L. 4361**

<table>
<thead>
<tr>
<th>Code</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>242</td>
<td>X Ben MD2/2004 R13 ch 1-10</td>
<td>Circular feature defined by curved drainage segments at edge of sand plain. More conspicuous on scanner data. 1km.</td>
</tr>
<tr>
<td>243</td>
<td>X Ben MD1/2009</td>
<td>Small circular in Cambrian sandstone. 200m.</td>
</tr>
<tr>
<td>244</td>
<td>X Ben MD2/2004 R13 ch 1-10</td>
<td>Dark circular feature. 500m.</td>
</tr>
<tr>
<td>249</td>
<td>X Ben MD1/2011 R15 ch 1-2,6-11</td>
<td>Circular structure, partly an embayment in Cambrian sandstone. 700m.</td>
</tr>
<tr>
<td>251</td>
<td>X Ben MD2/2002 R15 ch 1-2,6-11</td>
<td>Dark tonal anomaly with concentric pattern on west side – probably a gently folded ?Cambrian ben. 0.7 x 1.2km.</td>
</tr>
<tr>
<td>252</td>
<td>X Ben MD2/2002 R14 ch 1-10</td>
<td>Dark tonal anomaly in ?laterite. Dark in all visible and near infrared channels. 350m.</td>
</tr>
<tr>
<td>274</td>
<td>L Ben R15 ch 11</td>
<td>Thermal anomaly. 350m.</td>
</tr>
<tr>
<td>286</td>
<td>L Ben MD1/2013 R16 ch 3-11</td>
<td>Elliptical feature at edge of residual surface. Adjacent to this is small (100m) circular on NE-trending linear. The elliptical feature appears in a slightly different position on the thermal channel. 350 x 650m.</td>
</tr>
<tr>
<td>287</td>
<td>X Ben MD2/2002 R16 ch 1-11</td>
<td>Small concentric structure. Very vague on air photo. 450m.</td>
</tr>
<tr>
<td>288</td>
<td>L Ben MD4/1974 R16 ch 1-11</td>
<td>Circular feature with peripheral clay pans. 800m.</td>
</tr>
</tbody>
</table>
## TABLE 2.

### THEMATIC MAPPER ANOMALIES - E.L. 4361

<table>
<thead>
<tr>
<th>ID</th>
<th>Location</th>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>289 L Ben</td>
<td>R16 ch 1-11</td>
<td>Concentric structure with faint radial fractures. Most conspicuous on thermal channel. 300m.</td>
<td></td>
</tr>
<tr>
<td>323 M Box MD4/1972 R18 ch 1-6</td>
<td>Subcircular pale tonal and textural anomaly in pediment slope. On W to WNW-trending linear. No thermal anomaly. 700m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>325 L Box MD3/1984 R17 ch 2-10</td>
<td>Distinct but faint tonal anomaly in sand plain. Appears on scanner data with short radiating linears (100m). 500 x 800m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>328 X Box MD2/2000 R17 ch 1-2-4-5</td>
<td>Faint pale tonal anomaly in sand plain. 500 x 650m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>329 L Box MD1/2013 R18 ch 11</td>
<td>Circular broadening of creek bed at linear intersection. 300m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>330 L Box MD1/2013 R18 ch 1-11</td>
<td>Two concentric elliptical features; inner one is clearer on scanner data. Possible fold structure. 400 x 900m and 0.9 x 1.3 km.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>331 X Box MD1/2013 R17 ch 1-11</td>
<td>Indistinct circular feature in alluvium at major fracture intersection. 250m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>335 L Box MD3/1984 R17 ch 2-11</td>
<td>Small topo anomaly with radiating ridges and fractures. The ridges are probably dunes. 100 x 200m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>336 M Box MD1/2013 R17 ch 1-11</td>
<td>Small topo anomaly with radial fractures and possible dykes (E side). Near Proterozoic fold nose. 300m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>337 X Ben MD1/2013 R17 ch 1-11</td>
<td>Elliptical feature close to linear passing through No. 331. Most obvious on thermal channel. 250 x 550m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>Location</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>338</td>
<td>L Box MD2/2000 R17 ch 11</td>
<td>Thermal anomaly with possible radial fractures. 500m.</td>
<td></td>
</tr>
<tr>
<td>339</td>
<td>X Box MD4/1972 R17 ch 11</td>
<td>Faint thermal anomaly. Not anomalous on air photo. 250m.</td>
<td></td>
</tr>
<tr>
<td>542</td>
<td>X Box MD2/2001 R17 ch 4-10</td>
<td>Circular structure in colluvium. Truncated by creek bed. Not thermally anomalous. 800m.</td>
<td></td>
</tr>
<tr>
<td>546</td>
<td>H Ben MD1/2013 R16 ch 3-11</td>
<td>Small dark tonal anomaly with radiating fractures or dykes. 100m.</td>
<td></td>
</tr>
</tbody>
</table>
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 1l 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.

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. 4361 sixteen lowest, ten low, two medium and one high priority thematic target were outlined, details of these being listed in Table 2. Anomaly locations are given in Plan 1.
3.00 AIRBORNE MAGNETIC SURVEY

3.10 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 Drummmond area. Flight line spacing was 300 metres with lines oriented in a north-south direction. Additional survey specifications are listed in the legend to Plan 2.

Results within E.L. 4361 are presented as residual magnetic profiles, flight path and residual magnetic intensity plans (refer to Plans 2 to 28).

3.20 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. 4361 are presented as magnetic profiles and contoured plans (refer to Figures 3 to 12). Follow-up loam sampling programs were conducted over three of these potential target areas. Loam samples, which are surface scrape samples usually weighed 15 to 20 kg.

All sample locations are given on Plan 1.

3.30 Laboratory Phase

All samples collected during such follow-up sampling stages were forwarded to Ashton Mining's 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 30 samples collected within the licence, 29 contained no detectable kimberlite indicator minerals. One microdiamond and one garnet were recovered from the single remaining sample.

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

After completing follow-up exploration activities involving ground magnetic surveys and selective loam sampling, five anomalous targets within E.L. 4361, delineated by the airborne magnetic survey, were drill tested during the 1985 field season. Refer to Plan 1 for drillhole locations.

Drilling operations were carried out on behalf of the A.D.E. Joint Venture by core drilling contractors, Longyear Australia Pty. Limited. A truck mounted type-H22 rig was used for both openhole and diamond NQ and HQ coring.

Within E.L. 4361 five diamond drillholes, totalling approximately 487 metres were completed.

Drill core recovered from the program was progressively logged in the field by Ashton Mining geologists. Representative drill logs incorporating core recovery, magnetic susceptibility data and lithological interpretation are presented in Figures 13 to 17 (Refer to Appendix 2).
5.00 FUTURE PROGRAMS

Potential target areas outlined by the thematic mapper survey will be subject to field inspection and, where appropriate, ground magnetic surveys and/or loam sampling.

Further interpretation of airborne magnetic data together with additional ground follow-up in the form of detailed gravel and/or loam sampling and possibly additional ground magnetic surveys may also be undertaken.

Depending on the outcome of such a work program, the thematic mapper data, initially acquired on high density tape may be converted into computer compatible tapes for further image processing.

Drill core will be assessed of kimberlitic affinity and diamond potential using petrological, microprobe and microdiamond analysis.
ANOMALY BX3/8 BOXER

FIGURE 8
DECEMBER, 1985
ANOMALY BX3/9 BOXER

FIGURE 9

DECEMBER, 1985
ANOMALY BX3/10 BOXER

FIGURE 10

DECEMBER, 1985

ANOMALY BX3/10 BOXER
LINE 8100.0 SCALE 1: 5000.0 ANOTHER SCALE

ANOMALY BX3/10 BOXER
LINE 7900.0 SCALE 1: 5000.0 ANOTHER SCALE

ANOMALY BX3/10 BOXER
LINE 8000.0 SCALE 1: 5000.0 ANOTHER SCALE
ANOMALY BX6/2 BOXER

FIGURE 12

DECEMBER, 1985

ANOMALY BX6/2 BOXER
LINE 7100.0 SCALE 1: 5000.0 ANOM. NTV.

ANOMALY BX6/2 BOXER
LINE 7000.0 SCALE 1: 5000.0 ANOM. NTV.

ANOMALY BX6/2 BOXER
LINE 6900.0 SCALE 1: 5000.0 ANOM. NTV.
RESULTS OF LABORATORY EXAMINATIONS

LOAM SAMPLES EL 4361

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  +0.425 mm; denoted by +0.4

<table>
<thead>
<tr>
<th>Sample No</th>
<th>Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDR 830</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>MDR 831</td>
<td>Nil</td>
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</tr>
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<td>MDR 832</td>
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<td>MDR 849</td>
<td>Nil</td>
<td></td>
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<tr>
<td>MDR 850</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>MDR 852</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>MDR 853</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>MDR 854</td>
<td>1 -0.4 DIAMOND</td>
<td>1 +0.15 x 0.15 x 0.15 STONE grey, turbid, opaque. Cube shaped.</td>
</tr>
<tr>
<td>MDR 855</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>MDR 856</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>MDR 857</td>
<td>Nil</td>
<td></td>
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<td>MDR 858</td>
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<td></td>
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<tr>
<td>MDR 859</td>
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</tr>
<tr>
<td>MDR 880</td>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>
Drillhole: MD3
Magnetic anomaly: BX3/9
Grid position: 6900E, 4975N
E.L. 4361; Figure 13

Overburden

Micaceous schist and metasediments

End of hole 82.1

Overburden: includes black soil, unconsolidated to semiconsolidated Cretaceous (?) and other sediments.

A.D.E. JOINT VENTURE / ASHTON MINING LIMITED DECEMBER, 1985
Drillhole: MD4
Magnetic anomaly: BX3/8
Grid position: 9550E, 5000N
E.L. 4361; Figure 14

Overburden

Proterozoic (?) sediments - silty, feldspathic and carbonate sandstones

Highly altered, amygdaloidal, vesicular and porphyritic basic to ultrabasic (?) volcanic

Proterozoic (?) sediments - carbonate and mudstone sediments grading into quartz-rich grits

End of hole 219.05

* Overburden: Includes black soil, unconsolidated to semiconsolidated Cretaceous (?) and other sediments.
Drillhole: MD7
Magnetic anomaly: BX3/6
Grid position: 7 500E, 8 000N
E.L. 4361; Figure 15

Overburden*

Micaceous schist and metasediment

End of hole 55.4

*Overburden: includes black soil, unconsolidated to semiconsolidated Cretaceous(?) and other sediments.
Drillhole: MD9
Magnetic anomaly: BX3/4
Grid position: 9000E, 8950N
E.L. 4361; Figure 16

Overburden*

Micaceous schist and metasediments.

End of hole 73.2

*Overburden: Includes black soil, unconsolidated to semiconsolidated Cretaceous(?) and other sediments
Drillhole: MD11
Magnetic anomaly: BX3/5
Grid position: 9500E, 7960N
E.L. 4361; Figure 17

Overburden

Micaceous schist and metasediment

End of hole 57.5

*Overburden: Includes black soil, unconsolidated to semiconsolidated Cretaceous (?) and other sediments.
A.D.E. JOINT VENTURE

EXPLORATION LICENCE NO. 4361

EXPENDITURE FOR THE YEAR ENDED 29.11.1985

$  

Salaries 7,066
Field & Laboratory Expenses 102,836
Miscellaneous 5,024

Expenditure for year: $114,926

Date Licence Granted: 30.11.83