MARY RIVER URANIUM JOINT VENTURE

1972 EXPLORATION REPORT

EXPLORATION LICENCE AREAS 82, 83, 84, 85

Mary River Area, Northern Territory.

OPEN FILE

Prepared for: Australian Geophysical Pty. Ltd.
Compagnie Francaise des Petroles
Stormy Ventures Limited
William Baird Mining Limited

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13th December, 1972
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INTRODUCTION

This report describes exploration carried out for the Mary River Uranium Joint Venture on four Exploration Licence areas in the Mary River district of the Northern Territory of Australia.

Partners in the venture are:

Australian Geophysical Pty. Ltd.
Compagnie Francaise des Petroles
Stormy Ventures Limited
William Baird Mining Limited

The field programme commenced on June 17th, 1972, and ended on October 23rd, 1972.

The purpose of the programme was to identify airborne radiometric anomalies from earlier data, and to perform ground tests of the anomalies using a GLS-2 spectrometer and follow-up rotary drilling.
SUMMARY

Thirty-one radiometrically anomalous areas were defined by ground spectrometer traversing. Of these seventeen were drilled. All drill holes were logged radiometrically using a down hole probe. In our opinion there is no possibility of significant uranium occurrence in any of the anomalies tested. One area of gossan occurrence noted in the course of the work merits some further attention.
RECOMMENDATIONS

1. The occurrence of a uranium deposit within the area cannot be completely disproven. It is our opinion that despite the fact that there are favourable geological associations, the existence of considerable laterite cover would make the continuance of the search a poor risk at this stage with the present knowledge of occurrence and techniques available. In view of the fact that the most significant areas and airborne anomalies have now been checked out, we must presume that if there are deposits they are laterite covered. Therefore, we recommend that the parties give consideration to:

(a) Farming out the area
(b) Relinquishing the area

2. The occurrence of copper in anomalous quantities in the soil at the Gee Anomaly opens possibilities in this area. The geological association suggests that a sedimentary deposition of ore would be possible and this would be worth-while investigating further.
The immediate task, therefore, would be to determine if there is significant primary copper mineralization, and if so, what is its mode of occurrence.

We therefore recommend that the exploration as detailed in the text be carried out.

To protect this area, in the event that relinquishment of the area is considered, Area II should be retained.
Four tenements are the subject of the joint venture as follows:

1. Exploration Licence No. 82  280 sq. m.
2. Exploration Licence No. 83  264 sq. m.
3. Exploration Licence No. 84  156 sq. m.
4. Exploration Licence No. 85  285 sq. m.

The grantee is Macmine Pty. Ltd. A Trust Agreement exists between Macmine and Australian Geophysical in respect of Macmine's rights under the Exploration Licences.
REGIONAL GEOLOGY

The Mary River area contains largely Lower Proterozoic sediments deposited on the eastern shelf and slope of the Pine Creek Geosyncline. The Archaean basement to the Geosyncline, which is host to the major uranium discoveries to the east, is not exposed within the Licence areas.

The main Formation in the area is the Masson, which comprises (pyritic) carbonaceous siltstones, with quartz sandstone and quartz greywacke. There is minor development of the Koolpin Formation, deposited in a late-stage trough on the eastern margin of the geosyncline.

These two Formations are overlain unconformably in the south-east of the Licence areas by Upper Proterozoic rocks, deposited in a shallow intra-cratonic basin. The basal units present in the area are the Edith River Volcanics (acid lavas and pyroclastics), the Kurrundie Member (quartz greywacke) and the Plum Tree Creek Volcanic Member (andesite and tuff). These have a lenticular development prior to the deposition of the extensive Kombolgie Formation which consists of medium to coarse grained quartz arenites.
The Cullen Granite intrudes the southwestern sector of the area. This ranges in composition from granite to adamellite. Potassic felspars are microcline, microcline-perthite, perthite and orthoclase. The age is placed at 1695 million years by K/A determination and 1765 ± 90 million years by Rb/Sr determination on biotite.

The last episode was the deposition of the Lower Cretaceous Mullaman Beds, sandstone and conglomerate.
DATA PROCESSING

Raw data obtained from airborne spectrometry of the area was in the form of ink pen traces on roll charts in the following channels:

- Total count
- Potassium
- Thorium
- Uranium

The Potassium, Thorium and Uranium channels were hand filtered and digitised for computer input. Computer output was in the form of a graphical presentation of Uranium, Thorium, Potassium, Uranium:Thorium, Uranium:Potassium.

Anomalies were identified in terms of peaks in the Uranium:Thorium and/or Uranium:Potassium ratio plots, and described in terms of the following parameters:

1. Regional background (B).

   This is the base ratio value for the subject flight line, being the average Uranium:Potassium ratio for the entire flight line. It is necessarily an approximation based on
the expectation that regional background is likely to have more variation east-west than north-south.

2. Local base ratio (LB).

This figure is the average of the ratios in the vicinity of the anomaly. The selection of 'vicinity' is based on geophysicist's judgement.

3. Anomaly value (R).

This is the maximum value of the ratio anomaly.

4. Class.

This attempts to quantify the contribution of elements to the ratio as follows:

- 0.75 : low Thorium (Potassium) only.
- 1.00 : equal Uranium and Thorium (Potassium) contributions.
- 1.25 : significant Uranium contribution.

5. R/LB

This ratio is of fundamental importance in describing anomaly magnitude.
6. LB/B.

This ratio quantifies the contribution of variation in local background compared with regional background.

7. Anomaly Rating ('Pratt Factor').

As a basis for comparing airborne anomalies for ground follow-up, the product of parameters 4, 5 and 6 was used.

Anomalies are colour coded on the area plans in terms of the Anomaly Rating.
DRILLING SUMMARY

Total drilling footages on all anomalies tested are as follows:

T15                      91.5
T24-2                     116
T24-3                     298.5
T36-1                     153
T64-3                     52
T39-4                     315
T44-2                     364
T60-1                     202
T75-1                     214
T79-1                     559.5
T81-1                     60
T81-2                     848
               101
               155
T81-3                     40.5
T83-1 )                   193
T84-3 )                   156
T84-2                     112

Total:                   4031.0
NOTES ON INDIVIDUAL ANOMALIES

AREA I

Anomaly T24-2:

The anomaly lies between the West Alligator and the Wildman Rivers at 12°57' south latitude, 132°7' east longitude, or four miles due west of the point where the recently constructed Arnhem Highway crosses the West Alligator River.

Access to the gridded area involves 1.5 miles off-road travel north of the Arnhem Highway.

The airborne anomaly has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 750
2. Local background (LB) : 750
3. Anomaly maximum (R) : 1250
4. Class : 1.00
5. R/LB : 1.67
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') : 1.67
There is no distinctive total count feature in the anomaly position.

On ground, the airborne anomaly was located 200 metres north of the T24 flight line and showed reasonable definition along a possible north-west trend in terms of Uranium counts per second, although the western limit is imposed by alluvial cover.

No outcrop was encountered. Surficial material was mainly lateritic pisolites, weakly to moderately ferruginous.

Six drill sites were selected at PP-4W (16 ft.) and at 2N-7W (10 ft.), 2N-5W (16 ft.), 2N-00 (16 ft.), 2N-1.25E (24 ft.) and 2N-6.8E (34 ft.).

Total drilling: 116 feet.

The 2N line of holes showed a ferruginous lateritic zone increasing in thickness towards the east. The lateritic material was red-brown and pisolitic. The underlying meta-sediments were clayey and friable being subject to pallid zone weathering.

Down hole spectrometry showed a consistent pattern in terms of total count and uranium count. Both counts peaked at the base of the ferruginous laterite profile followed by first a sharp
decrease then a slow decrease with depth in the pallid zone.

Assessment: The anomaly appears to be attributable to an area of thin cover over a ferruginous laterite sheet. Counts decrease with depth showing little potential for significant uranium.
Anomaly T24-3:

This anomaly lies one mile to the east of anomaly T24-2.

The airborne anomaly has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 950
2. Local background (LB) : 1150
3. Anomaly maximum (R) : 1200
4. Class : 1.00
5. R/LB : 1.26
6. LB/B : 1.00
7. 4 x 5 x 6 (Pratt Factor) : 1.26

It is positioned on a weak total count contour 'saddle'.

Ground traverses showed the anomaly to be centred 200 metres south of the T24 flight line. There was good definition along a north-south trend (Uranium c.p.s.). An alluvial channel depresses readings in the north-west corner of the grid.

No outcrop was encountered. Surficial material was mainly laterite and pisolitic laterite eluvium with minor quartz sand.
Twelve drill holes were put down at 2N-3E (16 ft.), PP-3E (22 ft.), 2S-2W (10 ft.), 2S-1W (34 ft.), 2S-0O (40 ft.), 4S-3W (22 ft.), 4S-2W (8.5 ft.), 4S-0O (40 ft.), 6S-2W (28 ft.), 6S-1W (22 ft.), 6S-1E (34 ft.) and 6S-5E (22 ft.).

Total drilling: 298.5 feet.

All drill holes with the exception of 6S-1E and 6S-5E went into weathered rock at shallow depths. The two holes mentioned intersected red-brown laterite to depths of five and ten feet in the south-east of the area. Meta-sediments were encountered in all holes, white or grey in the pallid zone, or showing mottling nearer to surface.

Down hole spectrometry showed the usual peak at shallow depths decreasing to about ten feet. A number of holes then showed a progressive increase in both Uranium and total count, to a maximum of 370 c.p.s. total and 9.8 c.p.s. Uranium at about 30 feet.

Assessment: The anomaly appears to have as its source a weak concentration of radioactive elements in the near surface rock. The shape of the anomaly is partly determined by this and by the distribution of alluvial cover.
Anomaly T36-1:

The anomaly is located on the Darwin 1:250,000 sheet at 12°50' south latitude and 131°55' east longitude. It is adjacent to the north side of the Arnhem Highway at a point 2.5 miles west of the crossing of the Wildman River.

The airborne anomaly has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 1000
2. Local background (LB) : 1050
3. Anomaly maximum (R) : 1450
4. Class : 1.25
5. R/LB : 1.38
6. LB/B : 1.05
7. 4 x 5 x 6 ('Pratt Factor') : 1.81

It is positioned on a weak 'saddle' in the total count contours.

Ground traverses located no significant anomaly.

There is no outcrop in the area and surficial material consists of laterite eluvium.
Three drill holes were put down to the north of the traverse lines to test the depth variation in a radiometrically low situation. Depths drilled were 53 feet, 47 feet and 53 feet.

Total drilling: 153 feet.

The holes intersected a red-brown pisolithic laterite crust overlying clayey meta-sediments in the mottled zone.

Total count and Uranium c.p.s. down hole readings showed the usual peak at the base of the ferruginous zone, but the peaks had significantly lower values than on other anomalies (300 total c.p.s. maximum compared with over 400 total c.p.s.).

Assessment: Lower surface counts correspond with lower down hole counts. The airborne anomaly is unexplained.
Anomaly T39-4:

The anomaly is located on the Darwin 1:250,000 sheet at 12°51' south latitude and 131°58' east longitude. It is 1.5 miles southeast of the point where the Arnhem Highway crosses the Wildman River.

Access is gained by turning south from the Arnhem Highway at a point 0.25 miles east of the Wildman Crossing.

The airborne anomaly has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 1000
2. Local background (LB) : 1000
3. Anomaly maximum (R) : 1450
4. Class : 1.25
5. R/LB : 1.45
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') 1.81

It is positioned on a well defined north-northwest south-southeast trending 'ridge' in the total count contours.

The ground traversing has clearly defined the 'ridge' and its trend. The peak value was obtained on the T39 flight line.
There is no outcrop in the area gridded. Although some meta-sediment float was noted at a few points it could not be termed sub-outcrop. Surficial material was laterite detritus and some quartz sand.

Seven drill holes were put down: 4N-9W (53 ft.), 4N-5W (23 ft.), PP-7W (53 ft.), PP-5W (40 ft.), 2S-6W (46 ft.), 2S-5W (54 ft.) and 2S-1.5W (46 ft.).

Total drilling: 315 ft.

The laterite intersections in the holes were thin, and were underlain by mottled zone and pallid zone claystones. On lines PP and 2S the customary peaks showed at the base of the ferruginous zone, but these values are unusually low. On line 4N, two holes drilled on the flanks of the 'ridge' showed only incipient peaks at that position.

Assessment: This investigation showed good correlation between airborne and ground spectrometry. The lower order peaks (about 300 total c.p.s.) are surprising considering the good anomaly definition, but the strength of the R/LB ratio may explain this.
Anomaly T44-2:

The anomaly is located on the Alligator River 1:250,000 sheet at 12°51' south latitude and 132°2' east longitude. It is 2.5 miles south from where the Arnhem Highway crosses the east anabranch of the Wildman River.

Access is gained by turning south from the Highway 0.25 miles east of that crossing.

The airborne anomaly has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 750
2. Local background (LB) : 750
3. Anomaly maximum (R) : 1125
4. Class : 1.25
5. R/LB : 1.50
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') : 1.88

There is no distinctive total count contour feature in the anomaly position.
Ground spectrometry has located the anomaly as a narrow 'ridge' trending northwesterly. This trend may in part be attributable to an alluvial channel in the southwest part of the grid area. The anomaly is represented on the T44 flight line.

Outcrop of pisolitic laterite was noted at 2S-7E. Elsewhere the surficial cover is laterite pisolites and quartz sand.

Seven drill holes were put down: 2N-7E (52 ft.), PP-1W (52 ft.), PP-2.5E (52 ft.), 2S-3E (52 ft.), 2S-7E (52 ft.), 4S-4E (52 ft.) and 4S-6E (52 ft.).

Total drilling: 364 ft.

Drilling intersected a red-brown laterite cover between five and ten feet thick. This overlies buff to greenish weathered claystone, in parts recognizably sheared, and mottled below the base of the ferruginous zone.

The usual down-hole spectrometer 'peaks' at the base of the ferruginous zone are present, but are of low order (less than 300 total c.p.s.). However, at the limit of the probe extension definite peaks occurred, of the order of 300 c.p.s. compared with an average of 210 to 220 c.p.s. for the greater part of the hole. This may be due, at least in part, to the end of hole geometry.
Assessment: Values are generally of too low an order to be significant, but the end of hole peaks require explanation.
Anomaly T60-1:

The anomaly is located on the Adelaide River 1:250,000 sheet at 12°52' south latitude and 132°2' east longitude. It is adjacent to the track which links the Arnhem Highway at the Wildman crossing to the Oenpelli Road to the south. It lies 0.5 miles east of the track, 3.5 miles north of the Oenpelli Road.

The airborne anomaly has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 800
2. Local background (LB) : 800
3. Anomaly maximum (R) : 1250
4. Class : 1.25
5. R/LB : 1.56
6. LB/B : 1.00
7. $4 \times 5 \times 6$ ('Pratt Factor') : 1.95

The anomaly appears to be related to a low-order northeast-southwest 'ridge' in the total count contours.

The ground traversing has located the anomaly and a similar trend is apparent.
A low ridge between 2S-3E and 2N-4E carries sub-outcrop of ferruginous laminated siltstone. This parallels the anomaly trend. Laterite detritus is ubiquitous. Lower values to the east relate to an area of alluvium.

Five drill holes were put down: 2N-2E (64 ft.), 2S-4.5E (35 ft.), 2S-5E (35 ft.), 2S-5.5E (34 ft.) and 2S-6E (34 ft.).

Total drilling: 202 feet.

Drilling showed that the ferruginous laterite zone was thin to non-existent on line 2S. On line 2N however, the laterite was 10 feet thick.

The underlying rock type appeared to be coarser grained than usual and is logged as a pink to buff coloured siltstone.

On line 2S the usual near-surface spectrometer peaks are incipient to non-existent. One hole shows the terminal increase pattern.

On line 2N the peak at the base of the ferruginous zone is of low order (250 total c.p.s.) but is well defined.

Assessment: Values are too low order to be significant. The terminal increase in hole 2S-4.5E requires explanation.
Anomalies T60-3, T60-4, T60-5:

The anomalies are located at 12°54' south latitude and 132°13', 132°14' and 132°15' east longitude respectively, on the Alligator River 1:250,000 sheet. They are not associated with any marked total count feature.

They have the following characteristics in terms of Uranium : Potassium ratio.

<table>
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<th>T60-4</th>
<th>T60-5</th>
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<tr>
<td>1. Regional background (B) :</td>
<td>800</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>2. Local background (LB) :</td>
<td>900</td>
<td>900</td>
<td>900</td>
</tr>
<tr>
<td>3. Anomaly maximum (R) :</td>
<td>1300</td>
<td>1400</td>
<td>1450</td>
</tr>
<tr>
<td>4. Class :</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>5. R/LB :</td>
<td>1.44</td>
<td>1.56</td>
<td>1.61</td>
</tr>
<tr>
<td>6. LB/B :</td>
<td>1.13</td>
<td>1.13</td>
<td>1.13</td>
</tr>
<tr>
<td>7. 4 x 5 x 6 ('Pratt Factor') :</td>
<td>1.62</td>
<td>1.76</td>
<td>1.82</td>
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Reconnaissance traversing of the areas was done monitoring for anomalous activity using total count. Values were low, lateritic areas showed slightly higher counts.

Traversing was continued beyond T60-3 to the east boundary of the Exploration Licence area. Outcrop was generally poor, but rocks of the Koolpin Formation were confirmed.
In view of the fact that rocks of this Formation are host to the South Alligator uranium deposit, and that there is a remote possibility of structural projection into this Licence area, further traversing of the south-east corner of Area I was undertaken.

Ten miles of traversing across strike was done. The main rock type is claystone, variously ferruginous and lateritised. There is considerable development of pisolitic laterite. Trends are northwest-southeast, swing to east-west in the extreme corner. Dips noted average 40 degrees to the north and northeast. A tongue of quartz-felspar porphyry intrudes argillites in the extreme southeast corner.

The higher total count readings were between 125 and 150 c.p.s. with U + Th between 5.5 and 7.5.
Anomaly T64-3:

The anomaly is at $12^\circ56'$ south latitude and $132^\circ4'$ east longitude on the Alligator River 1:250,000 sheet. It is adjacent to the eastern headwater of the Wildman River.

Access is from the track which links the Arnhem Highway at the Wildman Crossing with the Oenpelli Road, via a turnoff east, 3.5 miles north of the Oenpelli Road.

The airborne anomaly has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 700
2. Local background (LB) : 850
3. Anomaly maximum (R) : 1200
4. Class : 1.25
5. R/LB : 1.41
6. LB/B : 1.21
7. $4 \times 5 \times 6$ ('Pratt Factor') : 2.13

Ground traversing produced comparatively erratic profiles with both uranium and total count peaks a little higher than normal at 5.7 and 150 c.p.s. respectively.
No outcrop was noted in the grid area, and laterite scatter was general.

Two drill holes were put down at 2S-5E (28 ft.) and 2S-7E (24 ft.)

Total drilling: 52 feet.

Both holes encountered ten feet of laterite underlain by buff-coloured claystone.

The down-hole spectrometer readings showed peaks at the base of the ferruginous zone and terminal increases to a little over 200 total c.p.s. The highest down-hole uranium reading was 9.5 c.p.s. in laterite.

Assessment: Low down-hole values at the points where the strongest surface readings were obtained down-grades the prospect.
Anomaly T65-3:

The anomaly is located at 12°56' south latitude and 132°19' east longitude on the Alligator River 1:250,000 sheet.

The anomaly is on a weak total count 'ridge' in the south-east corner of Area I. The 'ridge' parallels the structural trend defined by the ground traversing.

One profile was recorded over the anomaly position. Total count ranged from 60 to 95 c.p.s. over ten readings at 100 metre intervals. U + Th + K ranged 5.5 to 6.5, U + Th 3.5 to 4.5, Th 0.5 to 1.0.

The airborne anomaly has the following Uranium : Potassium ratio characteristics.

1. Regional background (B) : 700
2. Local background (LB) : 700
3. Anomaly maximum (R) : 1200
4. Class : 1.25
5. R/LB : 1.71
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') : 2.14

All ground spectrometer readings are considered to be too low to be of interest.
Anomaly T66-1:

The anomaly is located at $12^\circ 56'$ south latitude and $132^\circ 19'$ east longitude on the Alligator River 1:250,000 sheet.

The anomaly is situated on a local total count high which exhibits parallelism to local structure.

One profile was recorded over the anomaly position. Total count ranged from 65 to 150 c.p.s.; Uranium count varied from 2 to 3.8 c.p.s.

The airborne anomaly has the following Uranium : Potassium ratio characteristics:

1. Regional background (B) : 900
2. Local background (LB) : 900
3. Anomaly maximum (R) : 1450
4. Class : 1.00
5. R/LB : 1.61
6. LB/B : 1.00
7. $4 \times 5 \times 6$ ('Pratt Factor') : 1.61

All ground spectrometer readings are considered too low to be of interest.
Anomaly T75-1:

The anomaly has coordinates of 12°59' south latitude 131°54' east longitude on the Darwin 1:250,000 sheet. It is seven miles west of the intersection between the Oenpelli Road and the track which runs north to the Arnhem Highway. Access is from the Oenpelli Road.

The anomaly has a distinct representation in the airborne total count contours. These suggest a northeast-southwest trend.

The airborne anomaly has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 650
2. Local background (LB) : 650
3. Anomaly maximum (R) : 1250
4. Class : 1.25
5. R/LB : 1.92
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') : 2.40

The ground follow-up spectrometry showed good position and orientation agreement with the airborne data.
The surface Uranium c.p.s. were unusually high compared with others obtained during the investigation, up to 9.1, and total c.p.s. to 320 at surface.

Eight drill holes were put down to test the anomaly: 2N-3E (28 ft.), PP-3W (12 ft.), PP-2W (28 ft.), PP-0.25W (44 ft.), PP-0.75E (28 ft.), PP-3E (22 ft.), 0.5S-2E (28 ft.) and 2S-3E (24 ft.).

Total drilling: 214 feet.

Down-hole spectrometer measurements showed unusually strong uranium and total counts at the base of the ferruginous laterite zone, and the airborne anomaly is certainly attributable to an unusual degree of concentration of radioactive elements near surface. Lower in the holes total c.p.s. does not exceed 200, which effectively discounts any presence of primary uranium.

Rock types intersected were white to pale buff claystones and pale greenish sandstones. Some silicification was evident.

Assessment: Although this is the most prominent anomaly in the area, both in terms of total count and Uranium: Potassium ratio, its presence is entirely explained by secondary concentration in the laterite profile.
Anomaly T79-1:

The anomaly is located at $12^\circ 59'$ south latitude and $131^\circ 59'$ east longitude on the Darwin 1:250,000 sheet. It is three miles southwest of the intersection between the Oenpelli Road and the connecting track to the Arnhem Highway. Access is from the Oenpelli Road.

The airborne ratio anomaly is positioned on the east flank of a prominent total count contour anomaly.

The airborne anomaly has the following characteristics in terms of Uranium : Potassium ratio.

1. Regional background (B) : 650
2. Local background (LB) : 700
3. Anomaly maximum (R) : 1000
4. Class : 1.25
5. R/LB : 1.43
6. LB/B : 1.08
7. $4 \times 5 \times 6$ ('Pratt Factor') : 1.93

The ground spectrometer traversing produced irregular profiles with local 'strong' uranium and total c.p.s.
Twenty-three drill holes were put down, eleven at 100 metre intervals on line PP between 8W and 2E, and twelve at 100 metre intervals on line 2S between 8W and 2E, with one at 5.5W. Total drilling : 559.5 feet.

The pattern drilling enables deductions to be drawn regarding the relations between the down-hole vertical profiles, the surface horizontal profiles and the airborne profile. Strongest surface values relate to situations where uranium concentration in the laterite profile is near surface. Where the surface readings are weaker, it can be seen that the down-hole total count peak is displaced deeper in the profile.

Assessment : The close drilling pattern reinforces the conclusion that both the total count and ratio airborne anomalies are attributable to variations in the lateritic concentration of uranium.
Anomaly T81-1:

The anomaly is located at 13°00' south latitude and 131°54' east longitude on the Darwin 1:250,000 sheet. It is eight miles west-southwest of the intersection between the Oenpelli Road and the connecting track to the Arnhem Highway. Access is from the Oenpelli Road.

There is no distinctive total count contour feature which relates to the position of the ratio anomaly.

The airborne anomaly has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 650
2. Local background (LB) : 650
3. Anomaly maximum (R) : 950
4. Class : 1.25
5. R/LB : 1.46
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') : 1.83

The results of ground traversing were generally low in terms of uranium c.p.s. Higher values (to 4.5 c.p.s.) were obtained at the east end of the 2N grid line.
No outcrop was noted in the grid area. Around 2N - 2E to 2N - 5E there was suboutcrop of laterite.

Three drill holes were put down, one in the position of higher uranium count at 2N-2E (16 ft.), one on a higher U:K value at PP-2W (16 ft.) and the third at 2S-6E (28 ft.). All showed total count peaks related to the ferruginous laterite. These were low order, about 200 c.p.s., and were depressed in the profile rather than being near surface.

Total drilling : 60 feet.

Rock types are pallid zone claystones showing some silicification.

Assessment : The low order results discount the possibility of significant uranium.
ANOMALY T81-1
Anomaly T81-2:

The anomaly is located at 13°00' south latitude and 131°58' east longitude on the Darwin 1:250,000 sheet. It is four miles southwest of the intersection between the Oenpelli Road and the connecting track to the Arnhem Highway. Access is from the Oenpelli Road.

The ratio anomaly is superimposed on a distinct total count contour high, part of an arcuate chain of four such anomalies, convex southwards.

It has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 650
2. Local background (LB) : 650
3. Anomaly maximum (R) : 1000
4. Class : 1.25
5. R/LB : 1.54
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') : 1.93

Ground spectrometer traversing delineated conspicuous anomalies in terms of uranium and total c.p.s. Maximum counts were 11 uranium and 470 total.
No outcrop was noted in the grid area. Surficial deposits varied between quartz sand and laterite detritus.

Twenty-seven drill holes were put down. On line 2N were: 8W (52 ft.), 6W (22 ft.), 1W (22 ft.) and 2E (22 ft.); on line 0.5N was: 0OE (22 ft.); on line PP were: 8.5W (54 ft.), 8W (45 ft.), 7.75W (52 ft.), 7W (22 ft.), 6W (22 ft.), 5W (54 ft.), 4W (22 ft.), 3W (22 ft.), 2W (22 ft.), 1W (22 ft.), 0.5W (40 ft.), 0OE (22 ft.), 1E (22 ft.), 2E (22 ft.), 3E (22 ft.), 4E (22 ft.), 7E (19 ft.) and 8E (20 ft.); on line 0.5S was OOE (22 ft.); on 2S were 9W (52 ft.), 2E (54 ft.), and 8E (54 ft.).

Total drilling: 848 feet.

Rock types encountered were variously lateritised claystones, pallid zone usually below ten feet, mottled to ferruginous above ten feet. Silicification is evident in some holes.

The two distinct patterns of down-hole total count profiles are again in evidence here. One pattern shows the usual sharp peak, but here they are of unusually high order, up to 920 and 1020 c.p.s. in 0.5S-0OE. PP-00 has been selected for follow-up deeper drilling to test this pattern.

The second pattern shows a depressed or non-existent peak near surface, then a gradual increase with depth, followed by a sharp terminal increase.
This is typified in hole PP-8W which has been selected for follow-up deeper drilling.

FOLLOW-UP DEEPER DRILLING

PP-00: A vertical hole was put down to 101 feet. It intersected five feet of ferruginous pisolithic laterite, underlain by mottled zone brown and white micaceous siltstones to 85 feet. At this depth there is abrupt transition to black carbonaceous siltstone.

PP-8W: This vertical hole was drilled to 155 feet. Near surface rocks are ferruginous quartzite to five feet, probably a silicified and lateritised siltstone. No pisolithic laterite was intersected. Mottled zone rocks, one a white quartzite, probably bleached and silicified siltstone, and the other, brown ferruginous siltstone continue to a depth of 120 feet. At that point there is a sharp transition to black carbonaceous siltstone. Fragments of clear crystalline quartz show in most samples, probably from secondary veining in the lateritised zone.

The rocks are of the Masson Formation within the Lower Proterozoic Goodparla Group.
ASSAYS

Samples from the lower section of each hole were assayed fluorimetrically for uranium. Results ranged from 3 to 7 p.p.m. uranium. The highest result was 14 p.p.m. uranium from between 70 and 75 feet in hole PP-8W. This converts to 0.029 lb. U₃O₈ per short ton.

Values fluctuate slightly in the oxidised zone, but are uniformly low below the base of oxidation. The highest result relates to a interval where no rock was recovered, and probably represents a shear zone.
Anomaly T81-3:

The anomaly is located at 13°00' south latitude, 131°55' east longitude on the Darwin 1:250,000 sheet area. It is seven miles west-southwest of the intersection between the Oenpelli Road and the connecting track to the Arnhem Highway. Access is from the Oenpelli Road.

The ratio anomaly is located on the west flank of a broad total count contour high.

It has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 650
2. Local background (LB) : 650
3. Anomaly maximum (R) : 950
4. Class : 1.25
5. R/LB : 1.45
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') : 1.81

The ground spectrometer traversing has indicated a pattern of surface uranium counts which suggests a 'ridge' of higher values trending north-northeasterly on the east side of the grid area.
The values on the PP line are depressed by alluvial cover.

No outcrop was noted in the grid area. Surficial material is mainly laterite detritus, apart from the central drainage.

The crest of the uranium c.p.s. 'ridge' on line 2S was drilled at 1E (24.5 ft.). One other hole was put down at 3W on line PP (16 ft.).

Total drilling: 40.5 feet.

Rock types were claystones subject to mottled zone lateritization. Both holes showed low order, near surface peaks in total c.p.s.

Assessment: Lack of significant values in areas of highest uranium c.p.s. downgrade the prospect.
Anomalies T83-1 and T84-3:

These anomalies have similar eastings on adjacent flight lines and have been treated as a single investigation. Their location is 13°01' south latitude and 131°57' east longitude on the Pine Creek 1:250,000 sheet. They are five miles southwest of the intersection between the Oenpelli Road and the connecting track to the Arnhem Highway. Access is from the Oenpelli Road.

These ratio anomalies are on the west flank of a low order total count anomaly. They have the following characteristics in terms of the Uranium : Potassium ratio.

<table>
<thead>
<tr>
<th></th>
<th>T83-1</th>
<th>T84-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Regional background (B) :</td>
<td>850</td>
<td>800</td>
</tr>
<tr>
<td>2. Local background (LB) :</td>
<td>850</td>
<td>850</td>
</tr>
<tr>
<td>3. Anomaly maximum (R) :</td>
<td>1250</td>
<td>1250</td>
</tr>
<tr>
<td>4. Class :</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>5. R/LB :</td>
<td>1.47</td>
<td>1.47</td>
</tr>
<tr>
<td>6. LB/B :</td>
<td>1.00</td>
<td>1.06</td>
</tr>
<tr>
<td>7. 4 x 5 x 6 ('Pratt Factor') :</td>
<td>1.84</td>
<td>1.95</td>
</tr>
</tbody>
</table>

Ground traversing showed the two to be effectively one low order anomaly. Maximum value was 5.4 c.p.s. uranium. Total count does not exceed 160 c.p.s. The grid area contains sub-outcrop of ferruginous claystones.
Eight drill holes were put down to test a spread of uranium values at 2N-2E (25 ft.), 2N-5E (24 ft.), PP-3W (24 ft.) and PP-1W (24 ft.) in anomaly T83-1, and at 2N-00 (12 ft.), PP-4W (28 ft.), PP-1E (28 ft.) and 2S-6W (28 ft.) in anomaly T84-3. Total drilling: 193 feet.

Most holes intersected a thin laterite profile and the down hole spectrometry gave the usual associated peaks in uranium and total c.p.s. However, one hole PP-1E in anomaly T84-3 was collared in siltstone sub-outcrop. This showed no initial peak, but instead the profile showed a marked terminal increase down-hole to over 400 total c.p.s. Uranium readings were 10.5 c.p.s. at that point.

Assessment: Uranium values are low at all points tested. The terminal increase situation requires further consideration, but at the uranium levels recorded is unlikely to be of economic significance.
Anomaly T84-2:

The anomaly is located at 13°01' south latitude and 131°54' east longitude on the Pine Creek 1:250,000 sheet. It is eight miles west-southwest of the intersection between the Oenpelli Road and the connecting track to the Arnhem Highway. Access is from the Oenpelli Road.

This anomaly is on the west flank of a broad irregular total count high. It has the following characteristics in terms of the Uranium : Potassium ratio.

1. Regional background (B) : 800
2. Local background (LB) : 975
3. Anomaly maximum (R) : 1375
4. Class : 1.00
5. R/LB : 1.41
6. LB/B : 1.82
7. 4 x 5 x 6 ('Pratt Factor') : 2.56

Ground traversing located the ratio anomaly 200 metres north of the T84 flight line. No outcrop was noted. Surficial material is sand and laterite scatter. Uranium surface readings were generally low with a peak of 5.5 at 2N-2E
Six drill holes were put down. These were at 2N-6W (28 ft.), 2N-2E (22 ft.), PP-5W (28 ft.), PP-3W (28 ft.), PP-4E (28 ft.) and 2S-1W (22 ft.).

Total drilling : 156 feet.

The thickness of laterite encountered was five feet average. Below this were variously red, brown, buff coloured claystones and siltstones. Low order peaks were defined in the down hole observations, and below the peaks readings averaged 200 total c.p.s.

Assessment : The low order uranium values downgrade the potential of this prospect.
Anomaly T85-2:

The anomaly is located at $13^\circ 01'$ south latitude and $131^\circ 53'$
east longitude on the Pine Creek 1:250,000 sheet. It is
8.5 miles west-southwest of the intersection between the
Oenpelli Road and the connecting track to the Arnhem Highway.
Access is from the Oenpelli Road.

There is no distinctive total count feature relating to the
position of this ratio anomaly. The anomaly has the following
Uranium : Potassium characteristics.

1. Regional background (B) : 800
2. Local background (LB) : 850
3. Anomaly maximum (R) : 1200
4. Class : 1.25
5. R/LB : 1.41
6. LB/B : 1.06
7. 4 x 5 x 6 ('Pratt Factor') : 1.87

Ground traversing located a low order anomaly 200 metres south
of the T85 flight line. The highest uranium reading was 4.8
c.p.s. and 130 c.p.s. total.

Four holes were drilled as follows: PP-00 (28 ft.), PP-4E (28 ft.),
2S-4W (28 ft.) and 2S-5E (28 ft.).

Total drilling : 112 feet.
The down-hole profiles show characteristic initial peaks associated with the ferruginous laterite profile. This was most marked in the case of PP-00. No significant terminal increase showed.

Assessment : Low order values preclude significant uranium.
ANOMALY T85-2

MARY RIVER AREA I
GRID LAYOUT
RADIOMETRIC GROUND TRAVERSE
AREA II

Anomaly Tl5:

Anomaly Tl5 is located at 13°14' south latitude and 131°59' east longitude on the Pine Creek 1:250,000 sheet. It is 5.5 miles east-southeast of the junction between the Mary River and George Creek.

The anomaly was selected for follow-up on the basis of a sharp peak on the uranium channel combined with low responses on other channels, including total.

One ground traverse showed precisely the characteristics of the airborne profile, low total c.p.s., a low order U:K peak and marked Uranium c.p.s. and U:Th peaks.

Three drill holes were put down to test the situation: PP-00 (44 ft.), 0.5S-2E (23.5 ft.) and 2S-3E (24 ft.).

Total drilling: 91.5 feet.

Minor outcrop of ferruginous siltstone exists, with coarser variants. Ferruginous siltstone and fine grained sandstones
were encountered in the drilling. An outcropping laterite cap to the west of the grid gave 160 total c.p.s.

Down hole spectrometry showed comparatively strong total c.p.s. peaks near surface, with uranium to 12.4 c.p.s.
Anomaly T93-1:

The anomaly is located at 13°31' south latitude and 132°15' east longitude on the Mount Evelyn 1:250,000 sheet. It is 3.5 miles south-southwest from the old Goodparla homestead.

The airborne anomaly has the following Uranium : Potassium ratio characteristics.

1. Regional background (B) : 950
2. Local background (LB) : 950
3. Anomaly maximum (R) : 1500
4. Class : 1.25
5. R/LB : 1.58
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') : 1.98

It relates to the unconformity at the base of the Cretaceous Mullaman Beds, here overlying Masson Formation ferruginous shales. Outcrop conditions were reasonably good, and readings taken over outcrop were in the following ranges:

Total : 70 to 110 c.p.s.
U + Th + K : 4 to 7.5 c.p.s.
U + Th : 2 to 3.5 c.p.s.
Th : less than 1.
One outcrop gave total less than 10 c.p.s.

No further work is warranted in this locality.
Anomalies Tlll (1, 2 and 3):

Anomalies Tlll-1 and Tlll-2 are at 13°35' south latitude and 132°19' east longitude. Anomaly Tlll-3 is at 13°35' south latitude and 132°20' east longitude. They are centred eight miles south-southwest of the old Goodparla homestead.

Tlll-1, Tlll-2:

The airborne ratio anomalies have the following characteristics:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional background (B) :</td>
<td>1000</td>
</tr>
<tr>
<td>Local background (LB) :</td>
<td>1000</td>
</tr>
<tr>
<td>Anomaly maximum (R) :</td>
<td>1700</td>
</tr>
<tr>
<td>Class :</td>
<td>1.25</td>
</tr>
<tr>
<td>R/LB :</td>
<td>1.70</td>
</tr>
<tr>
<td>LB/B :</td>
<td>1.00</td>
</tr>
<tr>
<td>4 x 5 x 6 ('Pratt Factor') :</td>
<td>2.13</td>
</tr>
</tbody>
</table>

Both ratio anomalies relate to total count contour anomalies over shallow dipping sandstones of the Upper Proterozoic Kombolgie Formation. Tlll-2 is to the south of the TllO-T.C. anomaly.
Ground reconnaissance at the position of T111-2 suggests that the anomaly is related to the contact between the Kombolgie Formation and a coarse acid tuff of the underlying Plum Tree Creek Volcanic Member. The highest readings on outcrop were:

<table>
<thead>
<tr>
<th>Component</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>70 c.p.s.</td>
</tr>
<tr>
<td>U + Th + K</td>
<td>4.5 c.p.s.</td>
</tr>
<tr>
<td>U + Th</td>
<td>3.5 c.p.s.</td>
</tr>
<tr>
<td>Th</td>
<td>1.4 c.p.s.</td>
</tr>
</tbody>
</table>

At T111-1 only Kombolgie sandstones were exposed and readings were uniformly low.
Tlll-3:

The airborne ratio anomaly has the following characteristics:

1. Regional background (B) : 1000
2. Local background (LB) : 1000
3. Anomaly maximum (R) : 1550
4. Class : 1.25
5. R/LB : 1.55
6. LB/B : 1.00
7. 4 x 5 x 6 ('Pratt Factor') : 1.94

It is positioned on a narrow linear total count contour anomaly which follows the contact between the Kombolgie Formation and the Plum Tree Creek Volcanic Member.

Ground reconnaissance showed that the higher total count readings were related to outcrops of felspathic tuff and quartz-felspar porphyry. The reading ranges were:

<table>
<thead>
<tr>
<th>Component</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>110 to 140 c.p.s.</td>
</tr>
<tr>
<td>U + Th + K</td>
<td>8 to 10.4 c.p.s.</td>
</tr>
<tr>
<td>U + Th</td>
<td>4.5 to 6.5 c.p.s.</td>
</tr>
<tr>
<td>Th</td>
<td>0.8 to 1.6 c.p.s.</td>
</tr>
</tbody>
</table>

The contribution of the Potassium content of the volcanics to the anomaly is evident.
Spectrometer readings on the adjacent Kombolgie sandstones averaged:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>40 c.p.s.</td>
</tr>
<tr>
<td><strong>U + Th + K</strong></td>
<td>4.0 c.p.s.</td>
</tr>
<tr>
<td><strong>U + Th</strong></td>
<td>1.5 c.p.s.</td>
</tr>
<tr>
<td><strong>Th</strong></td>
<td>0.6 c.p.s.</td>
</tr>
</tbody>
</table>
Anomaly T110-T.C. (Total count):

This anomaly is centred a quarter-mile north of T111-2. It is represented by a marked peak in the total count contours. The area was tested during the T111-2 investigation. Higher values in the vicinity of the anomaly location related to a black soil area. These were:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>130 c.p.s.</td>
</tr>
<tr>
<td>U + Th + K</td>
<td>8.0 c.p.s.</td>
</tr>
<tr>
<td>U + Th</td>
<td>5.0 c.p.s.</td>
</tr>
<tr>
<td>Th</td>
<td>1.0 c.p.s.</td>
</tr>
</tbody>
</table>
Anomaly T112-1 (Total count):

This anomaly is located at 13°35' south latitude and 132°20' east longitude. It represents the point of highest total count on the linear total count trend which also carries to T111-3 ratio anomaly. The separation along the trend of the two anomalies is 0.6 miles.

Reconnaissance traversing recorded low order total count and uranium values, but confirmed the contrast between the Kombolgie sandstones and the Plum Tree Creek volcanics, the former giving generally higher readings:

<table>
<thead>
<tr>
<th></th>
<th>Kombolgie</th>
<th>Plum Tree Creek</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>175</td>
<td>110 c.p.s.</td>
</tr>
<tr>
<td>U + Th + K</td>
<td>10.0</td>
<td>8.0 c.p.s.</td>
</tr>
<tr>
<td>U + Th</td>
<td>6.5</td>
<td>4.5 c.p.s.</td>
</tr>
<tr>
<td>Th</td>
<td>1.0</td>
<td>1.5 c.p.s.</td>
</tr>
</tbody>
</table>
Anomaly T112-2 (Total count):

This anomaly is located at $13^\circ 35'$ south latitude and $132^\circ 22'$ east longitude. It is 9.5 miles southeast of old Goodparla homestead on a bend in a tributary of Kombolgie Creek.

In the creek are exposures of greenish rhyolitic tuff belonging to the Edith River Volcanics, the lowermost member of the Upper Proterozoic sequence.

Spectrometer readings over outcrop are significantly higher than any others in the area. The range is as follows:

- Total : 330 to 340 c.p.s.
- U + Th + K : 17.5 to 21.5 c.p.s.
- U + Th : 9.5 to 12.0 c.p.s.
- Th : 2.0 to 2.5 c.p.s.

Again the potassium contribution is apparent.

The fault line which is shown on the Mount Evelyn 1:250,000 geological sheet as passing through this locality was identified as a ferruginous shear zone. Total count readings averaged 150 c.p.s. over this zone with lower values either side.
Total : 100 c.p.s.
U + Th + K : 7.5 c.p.s.
U + Th : 3.5 c.p.s.
Th : 1.0 c.p.s.

On this basis it is more probable that the total count anomaly relates to the rhyolitic lithology.
T111-T.C. ('Tuff Anomaly'):

This low order linear total count contour anomaly was selected for systematic traversing following reconnaissance work which indicated significantly higher readings related to a tuff horizon in the Edith River Volcanics at the base of the Upper Proterozoic. In this vicinity it overlies rocks of the Lower Proterozoic Golden Dyke Formation.

A grid was laid out to bracket the full width of tuff occurrence, 500 metres east-west by 200 metres north-south. Readings were taken at ten metre intervals on lines 100 metres apart. The location of the grid is at 13°34' south latitude and 132°20' east longitude.

Higher values in terms of total count (180 to 260 c.p.s.) and U + Th (6 to 9.5 c.p.s.) related directly to tuff outcrop and sub-outcrop.

Siltstones of the Golden Dyke Formation where outcropping gave readings of the order of 120 to 160 total c.p.s. and U + Th 5 to 6 c.p.s. Other lithologies, including some outliers of Cretaceous Mullaman sandstone, gave lower readings, less than 100 c.p.s. total.
As the uranium readings were at best of the same order as those obtained on many Area I anomalies, we consider that there is not a great deal of encouragement to test further. However, to put the matter beyond doubt, drilling at the localities of stronger values on the grid would be required. Such localities are: 30S-100W, 50N-200W and 40N-200E.
GRANITE CONTACT:

Four miles of the north east contact of the Cullen Granite with Masson Formation rocks were traversed between 13°22' south latitude, 132°02' east longitude and 13°24' south latitude, 132°06' east longitude.

The traverse was designed to cross and re-cross 200 metres of the contact zone while monitoring total count. Where drainages cut to bedrock, full readings were taken.

Typical readings were:

<table>
<thead>
<tr>
<th></th>
<th>Cullen</th>
<th>Masson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>160 - 260</td>
<td>110 - 120</td>
</tr>
<tr>
<td>U + Th + K</td>
<td>10.5 - 16.5</td>
<td>8.5 - 9.0</td>
</tr>
<tr>
<td>U + Th</td>
<td>5 - 9.5</td>
<td>4.0 - 4.4</td>
</tr>
<tr>
<td>Th</td>
<td>1 - 2</td>
<td>1.0</td>
</tr>
</tbody>
</table>

One exposure of the actual contact gave:

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Total</td>
<td>220 c.p.s.</td>
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<tr>
<td>U + Th + K</td>
<td>14.5 c.p.s.</td>
</tr>
<tr>
<td>U + Th</td>
<td>7.0 c.p.s.</td>
</tr>
<tr>
<td>Th</td>
<td>1.5 c.p.s.</td>
</tr>
</tbody>
</table>

No significant variations from this pattern were noted.
SOUTHERN UNCONFORMITY:

A significant extent of the Upper-Lower Proterozoic unconformity lies within E.L.82, but outside the area of airborne spectrometer coverage. A length of twelve miles of this unconformity was traversed using total count to monitor radioactivity. The traverse was made on, or in the interpreted position of the Plum Tree Creek Volcanic Member below the scarp of the Kombolgie Formation between 13°35' south latitude, 132°15' east longitude and 13°41' south latitude, 132°24' east longitude.

The highest reading was obtained on quartz felspar porphyry:

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<table>
<thead>
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<tbody>
<tr>
<td>Total</td>
<td>180 c.p.s.</td>
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<tr>
<td>U + Th + K</td>
<td>12.5 c.p.s.</td>
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<tr>
<td>U + Th</td>
<td>7.0 c.p.s.</td>
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<tr>
<td>Th</td>
<td>1.5 c.p.s.</td>
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</tbody>
</table>

Readings on the Kombolgie scree slope are in the range:

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<tr>
<td>Total</td>
<td>80 - 150 c.p.s</td>
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<tr>
<td>U + Th</td>
<td>4 - 6 c.p.s.</td>
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On Kombolgie sandstone itself:

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<tr>
<td>Total</td>
<td>40 - 80 c.p.s.</td>
</tr>
<tr>
<td>U + Th</td>
<td>2 - 5 c.p.s.</td>
</tr>
</tbody>
</table>
Tl09 Gee Anomaly:

Gossanous material was noted in this area. This occurred as float in an area of low relief and approximately 40 percent outcrop. Assays of the gossan indicated 450 p.p.m. copper and 1500 p.p.m. zinc.

The rock types in the area gridded are ferruginous (limonitic) sandstones and siltstones of the Masson Formation.

On the basis of the association between this gossan carrying anomalous copper and zinc, and rocks known from Area I drilling to be carbonaceous below the zone of oxidation, it was decided to bracket the occurrence in reconnaissance fashion with ~80 mesh soil sampling.

This was done on a grid measuring 240 metres east-west and 120 metres north-south.

Figure I is a contoured presentation of the copper and lead geochemical data. A linear copper anomaly is apparent which parallels the strike of the siltstones. The length of the anomaly is comparable with that of the grid at 1500 metres. Extensions beyond the grid are possible. A lower order anomaly extends northwest along a drainage which cuts the main anomalous zone.
The lead results are less well defined. The 40 p.p.m. contour shows a crude correlation with the copper pattern.

Assessment:

Although the anomalous copper zone is of low order, the possibility remains that it may be associated with a particular stratigraphic horizon. Some carbonaceous siltstone lithologies of the Masson Formation are known to be sulphide-bearing. Although we are not attempting to draw any correlation, the fact remains that there is a strong lithological similarity between the Lower Proterozoic carbonaceous siltstones of the Masson Formation in the Pine Creek Geosyncline and those of the Paradise Creek Formation in the northwest extension of the Mount Isa Geosyncline. The Mount Oxide digenite mineralization is obviously stratiform, and in our opinion the possibility is open for a similar occurrence within the Masson Formation.

Recommendation:

We consider further work is warranted to prove or disprove the existence of significant copper mineralization. This would be undertaken as follows:
1. Make a reconnaissance geological map of the gridded area at a scale of 1:2500.

2. Make a detailed outcrop geological map of the anomalous copper zones as defined by the 80 p.p.m. contour at a scale of 1:1000.

3. Simultaneously perform auger drill geochemistry using bottom samples (weathered rock) on three lines, the lines being selected to traverse the known anomaly maxima. The hole spacing on the lines should not exceed five metres.

If the geochemical profiles show peaks of the order of 1000 p.p.m. copper or more, the decision should be taken to proceed further with the investigation.

Depending on the magnitude of the copper results a recommendation would then be made to (a) proceed direct to percussion drilling below the base of oxidation on the best cross-section, or (b) to complete the geochemical grid at weathered rock level, before selecting percussion sites.

The above work is directed at determining whether primary copper mineralization exists at any grade. Subsequent work, given encouragement, would be directed at determining whether and how much potential ore grade material exists.
B.M.R. Anomaly:

That area between Areas I and II was previously covered by a total count airborne radiometric survey by the Bureau of Mineral Resources. The area contained no first order anomalies and only one second order anomaly. This second order anomaly was located and traversed.

This is located at 13°10' south latitude and 131°58' east longitude on the Pine Creek 1:250,000 sheet.

Whilst the anomaly was clearly defined in terms of total and uranium counts, the absolute values were not of any significant magnitude.

Sub-outcrop in the area was siltstone with some breccia fragments indicating a small fault zone.

No further work is warranted.

ADA EXPLORATIONS PTY. LIMITED

R. E. Cotton
EXPLORATION MANAGER
### COST RECONCILIATION

<table>
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**Total:**

- **$46,077.90**
- **$47,750.00**
- **$1,500.00**
ANOMALY T81-2

Mottled zone rocks, white bleached siltstones and red-brown ferruginous siltstones, minor quartz veining.

BASE OF OXIDATION

Black

Carbonaceous

Siltstones (Masson)

BASE OF OXIDATION

HORIZONTAL SCALE 1:10,000
VERTICAL SCALE 1:3,050
MARY RIVER AREA PERCUSSION DRILL HOLE SECTIONS

LATERNITE WEATHERED SEDIMENTS