C.R.A. EXPLORATION Pty. Limited

AERIAL RADIOMETRIC ANOMALIES
AREA 'C', RUM JUNGLE, N.T.

Ground Follow-Up Investigations

October, 1972

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Submit to: R.Y. Black
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1. SUMMARY

The results of detailed investigations on four radiometric anomalies and the reconnaissance of eight others are presented. It is recommended that detailed radiometric gridding and geological mapping be extended to all the anomalies defined by C.R.A. Exploration's airborne scintillometer survey of 1971.

2. INTRODUCTION

In the period 11th - 18th October ground investigations were conducted over anomalies 50-5, 57, 59 and 60 which were detected by airborne scintillometer in November, 1971. Several other anomalies detected by the airborne scintillometer survey were located on the ground. The investigations comprised ground radiometric gridding and geological mapping.

3. INDIVIDUAL ANOMALIES

3.1 Anomaly 50-5

This anomaly coincides with the site of the Watercourse No. 2 Uranium Prospect. The area was gridded in 1966 by the B.M.R. and many pegs from that survey were relocated and replaced by new ones. An area 200' x 2000' was covered by a 200' x 200' grid. Radiometric traverses were first run on east-west lines and then on selected north-south and diagonal lines (Plan No. NTd185).

A maximum reading of 1000 cps (scintrex BGS-1S) was obtained over the spoil heap from the shaft. The main anomaly occurs over carbonaceous shales which dip eastwards at 30°-50°. These overlie a hematite-quartzite-breccia with apparent conformity. A few isolated radiometric highs occur over shales which underlie the breccia.

Initial geological observations at the prospect are not in accordance with earlier mapping. It appears that at least two, and possibly three E.N.E. trending faults disrupt the easterly dipping succession. The movement in each case has resulted in a south-block-west displacement. The quartzite mapped by Semple in the south-west corner of the area is believed to be equivalent to the banded iron formation mapped further to the north; the amount of iron seems to decrease gradually southwards. Reading in the 'hematite' is similar to banding in the B.I.F.

Further geological mapping is required to clarify the structural outline of the prospect.
3.2 Anomaly 57

The maximum radioactivity previously detected at this anomaly was found in the south-eastern corner of the gridded area. It was decided to extend the grid to check for possible extensions of anomalous radioactivity. The grid was completed southwards to Stapleton Creek and eastwards until alluvium was encountered. One hill south of Stapleton Creek was gridded and another reconnoitred. No anomalous radioactivity was detected in any of these areas. Much of the area south of Anomaly 57 comprises alluvial plains which yield low radiometric values. These areas were traversed but not gridded.

The results of this additional work do not change the picture with respect to anomaly 57.

3.3 Anomaly 59

Anomaly 59 is caused by anomalous radioactivity which is associated with a ferruginous brecciated shale occurring within pyritic, carbonaceous siltstones. These siltstones are in the form of a wedge within a predominantly quartz greywacke sequence of the Noltenius formation. A small pit was found at the site of maximum radioactivity (240 cps - scintrex B35-15). The rocks at this point are highly ferruginized and silicified. There are veins of manganese and iron oxides, blobs of clay minerals, and the rock is somewhat brecciated. A brittle, white fibrous mineral occurs in one vugh.

A separate ferruginous horizon is mapped in the siltstones and has related slight increases of radioactivity. The rock is deep red, is of silt grade and appears intercalated in part but elsewhere has a speckled appearance. It possibly represents a tuffaceous horizon.

The area was gridded radiometrically and displayed only a small area of twice background radioactivity (Plan N2d 234).

3.4 Anomaly 60

This anomaly was detected on three adjacent flight lines. A base line was put in over a strike length of 1200'. In the local succession the anomaly lies in a position where siltstones of the Coldan Dyke Formation dip up into quartz greywackes of the Noltenius Formation. The dip is about 30° to the east. Anomalous radioactivity is related to a breccia horizon which is slightly discordant with the enclosing rocks. The breccia consists of a matrix of buck quartz with framboidal shale, biotite-quartzite, quartz greywacke and appears to represent a shear zone. It cannot be compared with the hematite-quartzite breccias found nearby in the area.
Carbonaceous siltstones and silicified black shales lie adjacent to the breccia. Thin greywacke horizons do occur west of the breccia but the Moltenius Formation proper with predominant quartz greywackes appears 200'-250' east of the breccia. It is interesting to note that the B.M.R. did not detect this anomaly from the air and that one ground traverse conducted during their Gould/Mt. Hinza survey (line 3335) passed across the anomaly at a point where the radioactivity is not anomalous.

3.5 Other Anomalies

The following anomalies were located on the ground:—34-9, 35-9, 34-10, 35-10, 40, 42-9, 44, 45.

All occur in an area where there is abundant laterite cover and little outcrop. In places, knobs of cellular lateritic siltstone protrude above the flat ground surface but usually there is a cover of soil and small magnetic siltstone and shale pebbles. There are occasional outcrops of ferruginous siltstones and ferruginised silicified shales. Several spot anomalies of up to 150 cps were noted in this area where background is 50—60 cps.

One rock type common to anomalies 59, 60 and found in several places in the Waterhouse No. 4 group of anomalies is a silicified and ferruginised siltstone which is halfway to being a jasper. It is commonly veined with iron and manganese oxides and may have yellow, orange and pink clay minerals in vughs. It is not clear whether this is a lateritisation effect or the result of hydrothermal alteration. The latter could be a possibility at Anomaly 60 where the anomalous radioactivity seems to be associated with a shear zone.

Another common factor is the association of black siltstones and shales with the anomalies, whether they occur in the Golden Dyke, Moltenius or Burrell Creek Formation.

Only anomaly 50-W (Waterhouse No. 2) is associated with a hematite-quartzite-breccia.

4. CONCLUSIONS

Rock samples are being assayed from anomalies 35-9, 40, 42-9, 44 and 50.

Geologic mapping has been completed and some geological mapping has been done over anomalies 50-W, 57, 59, 60 and 72.

None of the other anomalies, which were recognised in the airborne survey of November, 1971, has been looked at carefully since they are coincident with previously known anomalies. It is felt that more detailed work should be conducted over some of these anomalies.
The case for such detailed gridding is most strong in the Waterhouse No. 4 group of anomalies where the following points should be considered:-

(a) Surface and subsurface geological information is lacking due to a broad cover of laterite.

(b) There is a group of anomalies not simply a local area of higher background radioactivity.

(c) The laterite shows variable radioactivity and may reflect anomalous concentrations of radioactive elements in the underlying rocks.

(d) Anomalies of a similar order of magnitude e.g. 50-W, 59, and 60 have been gridded and the results obtained suggest that further work is necessary.

(e) Values obtained from reconnaissance with a scintrex in this area are locally comparable with results obtained in gridding other anomalies. Only at anomaly 73 was the point of maximum radioactivity discovered at the reconnaissance stage.

5. RECOMMENDATIONS

The emphasis during the airborne survey in November, 1971 was on finding new anomalies over Area J. The result was that only a few anomalies were investigated; those that coincided with previously known anomalies were immediately downgraded.

It has already been considered that previous investigations over the Waterhouse No. 2 prospect cannot be regarded as reliable (Hameet, Memorandum to R.J. Black, 3rd October, 1972); similar consideration should be extended to earlier radiometric surveys.

It is recommended that the Waterhouse No. 4 group of anomalies be gridded radiometrically and that the three remaining anomalies - 54, 50C/51 - 9W and 50E/51 - 9E - should be investigated and assessed. This will draw to a logical conclusion the ground follow-up work to the airborne scintillometer survey and will permit a realistic comparison and assessment of the individual anomalies.
KEYWORDS
Copper, uranium, geophys-rad., geol. mapping-detailed (1:2400)

Locality: Pine Creek SD52-8 1:250,000 Geological Map Sheet.
Batchelor Sheet 54, Zone 4 1:63,360 Geological Map Sheet.

LIST OF PLANS

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<td>NTd 187</td>
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Trench in silicified, ferruginised shale, 240 c.p.s. max.

Thin bands of intercalated siltstone rubble

Siltstone and greywacke rubble

Ferruginised tuffaceous siltstone

Wooden peg locations

Radiometric contours
(Scintrex 863-1S, Scintillation counter)

Noltenius Formation
B Quartz greywacke
Y Pyritic carbonaceous siltstone, silicified in part.
R Ferruginised siltstone, sometimes brecciated and silicified

PLATE 68

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RUM JUNGLE, AREA J
ANOMALY 59
Radiometric Contours
and Geology
SD 52 - 8

Report No 7662
C.M. Nov '72 Scale 1:2,400 Plan No.NTld.234
LEGEND

Scintrex BGS - IS Scintillation Counter
Serial No. 094484
Model No. 801011

- Traverse Limit
- Radiometric Contour in cps
  Background approx. 60
- Pegs Along Baseline at 100 ft Intervals
- Geological Boundary

A Quartz Greywacke
B Siltstone, Often Carbonaceous
  Siliceous, Greywacke Siltstone
C Quartz - Siltstone Breccia
D Siltstone, Carbonaceous Siltstone
  and Greywacke Siltstone

PLATE 69

CRA EXPLORATION PTY LIMITED

RUM JUNGLE, AREA J
ANOMALY 60
Radiometric Contours & Geology
SD 52 - B

Drawn: NOV. 72 Scale: 1:2,400 Plan No. NTd 186

Report No 7662
PLATE 70

C.R.A. EXPLORATION PTY LIMITED
RUM JUNGLE, AREA J
ANOMALY 73
Radiometric Contours
SD 52 - 8

Report No 7662
C. M. Nov '72
Scale 1:2,400
Plan NPNTd 187