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The Chief Geologist
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RADIOMETRIC SURVEYS KATHERINE - DARWIN AREA

REPORT ON ACTIVITIES, JUNE, 1954.

by

J.H. Lord.



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II	Reconnaissance Geological Map of Burrundie Prospect-Area.

ADMINISTRATIVE SECTION:

STAFF.

Movements:-

- E. Gardner, geologist, arrived in Darwin on 3rd June.
- G.F. Clarke, geophysicist, arrived in Darwin on 8th June.
- A. Debnam, geochemist, arrived in Darwin on 28th June.
- G. Canning, drill foreman, arrived in Darwin on 28th June.

Additions:-

- L. Jones, field assistant, commenced duty on 16th June.
- I.T. Jones, field assistant, commenced duty on 21st June.
- E.R. Lane, camp assistant, commenced duty on 22nd June.

Resignations:-

- E. Daley, camp assistant, resigned on 16th June.

OFFICE ACCOMMODATION.

Some minor jobs remain to be done on the office building. The builder has left the district and it is assumed that the Department of Works will complete the building.

After considerable delay the power was connected and air conditioners were moved to the laboratory section.

HOUSING.

No houses were made available during June. The power was not connected to Mr. Clarke's house until the end of the month.

Mr. Catley will be vacating his house as he is moving to Alice Springs, and it will be occupied by Mr. Thomas.

Three of the houses at Fannie Bay have been commenced and are progressing slowly.

WINNELLIE STORE.

Although it has been recommended on a number of occasions during the past five months, a stores' clerk has not yet been appointed to the store.

RADIOMETRIC LABORATORY.

A week was lost during this month while the laboratory was transferred from Winnellie to the Darwin office.

The number of samples received has increased greatly due to increased drilling by the Bureau and the increase in prospecting

by private companies. It will be necessary for the staff to work overtime in order to overcome the lag in assaying.

As considerable time is required for checking the assay results, it is suggested that another geophysicist be appointed to Darwin to supervise the laboratory and to check the results, so that J.B. Misz may be relieved for more important field duties.

Forty instruments have been repaired during the month. Twenty-one of these were for private operators.

One hundred and twenty-seven Radiometric assays were done.

TRANSPORT.

The only serious trouble this month with transport occurred with the landrover, which has the scintillometer mounted on it. The engine of this vehicle almost seized, which resulted in considerable delay while repairs were effected.

VISITORS.

Mr. P.B. Nye, Director of Bureau of Mineral Resources, arrived in Darwin on 25th June and departed on 2nd July. During his stay he inspected all the operations of the Radioactive Section and many prospects belonging to private companies.

Mr. M.A. Condon, Acting Chief Geologist, arrived in Darwin on 25th June and departed on 4th July. He accompanied Mr. Nye on his inspection and remained two extra days with the regional parties.

Mr. T. Barnes, Deputy Director of Mines, South Australia, and Messrs. R. Pitman and M. Reyner of the United States Atomic Energy Commission, visited the Northern Territory from 14th to 20th June. They were conducted to the following localities:- Rum Jungle, Adelaide River, Brock's Creek, Edith River and A.B.C. Prospects.

Mr. R. Clarke, geophysicist, visited Darwin from 29th June to 4th July, and was shown geophysical activities of the Radioactive Section.

TECHNICAL SECTION.

A.B.C. PROSPECT.

Two drills, which were operating during June, completed seventeen holes. The total footage drilled was 723 feet.

The programme has been concentrated on determining the attitude of the mineralisation by short vertical holes. No extension in depth has been proven, although there is a possibility at the south-western end of the lode. Considerable amount of geological information has been accumulated.

In the future, it is intended to complete the determination of the shape of the lode, prospect with short vertical holes other likely areas for repetition of mineralisation and to drill deep holes in an endeavour to solve the structural problem. Further bulldozing and costeaning will be done also.

The geophysicists have continued to probe the holes as

drilled and to carry out car-borne scintillometer work on the volcanics within the reserve. Detailed gridding has been done on any promising localities.

ADELAIDE RIVER PROSPECT.

The geophysicists of the Radioactive Section have continued with the gridding of this area and should complete the work during July. The delay has been caused through the shortage of staff.

Uranium Development and Prospecting N.L. have continued active prospecting on the area. A prospecting shaft off the lode has been sunk to over 30 feet, while the shaft on the rich find is down to over 20 feet. The stone broken from the latter shaft is being drummed and grab assays, taken by the company, indicate that the material should bulk approximately 0.6% eU_{308} .

One drill hole has been completed by the company and is to be probed by the Bureau.

An adit has been commenced to prospect what the company terms the "eastern lode."

BURRUNDIE PROSPECT.

This temporary reserve was reduced from 35 square miles to 1 square mile as shown on PLATE I.

The regional party completed its mapping and a report is being prepared. The regional geology of the area is shown on PLATE II.

Detailed mapping and radiometric gridding of the ridge on which the best anomaly was found, is in progress. Although readings up to four times background occur in the pits, no improvement has yet been found. It appears that it will be necessary either to sink an exploratory shaft or to drill in order to access the prospect, if it is decided that further work is warranted.

REGIONAL PARTY.

The regional party has been able to move more freely this month as the country has dried out. In consequence good progress has been made with mapping.

Mr. B.P. Walpole's monthly report (Appendix I) details the work done. The plans are not attached as they have yet to be drafted.

GEOCHEMICAL WORK.

Mr. A. Debnan, geochemist, who has arrived in the area is preparing his mobile laboratory for operation.

The first work to be ^{done} will be some geobotanical investigations, in conjunction with Mr. W. Bateman, forestry officer, on known radioactive prospects.

NEW FINDS.

There were thirty-eight Authorities to Prospect held at

the end of June with twenty-three pending. Most of the new Authorities have been granted to existing companies, while a few new prospectors have been granted areas.

North Australian Uranium Corporation has reported that the company has a promising prospect apparently about 70 miles east of Pine Creek.. No details have been supplied.

Brock's Creek Uranium Co. found a new lode on their lease on 1st July.

No other finds have been reported.

The following companies are engaged in active developmental work:-

Brock's Creek Uranium Co. has continued the inclined shaft to 68 feet in leached shales containing copper mineralisation and some uranium. The vertical shaft has been deepened to 80 feet in country rock.

Uranium Development and Prospecting, N.L. has continued working on Deposit E at Edith River in preparation for winging below the 100-foot level. The main effort of this company is concentrated at Adelaide River Prospect as described above.

Uranium Oxide N.L. at Yenberrie have sunk three prospecting shafts each to 50 feet. Work is now suspended.

North Australian Uranium Corporation N.L., have completed the second shaft to 50 feet on Authority to Prospect No. 104 at Edith River and have carried out considerable bulldozing. Work on this Prospect, which was never promising, has been suspended.

Several areas have been inspected during the month and brief reports are attached as Appendix II.

MONTHLY CONFERENCE.

Due to pressure of work this conference has been postponed until 10th July.

June, 1954.

J.H. Lord.

MONTHLY REPORT REGIONAL PARTIES RADIOACTIVE SECTION
JUNE, 1954.

General.

The Ban Ban and Ranford Parties moved to the McKinlay River area on the 1st June and continued mapping of the Burrundie and Table Top 1 mile sheets. A start was also made on the Ban Ban 1 mile sheet.

The Tipperary Party remained at Burrells Creek base camp and continued mapping of the Tipperary and Burnside 1 mile sheets.

Messrs. P.B. Nye, M.A. Condon and J.H. Lord visited the regional parties on 27th and 28th June.

P.R. Dunn, Geologist Gde. 1, joined the Ban Ban party on 1. 6. 54.

Geological Mapping.

Details of the areas mapped are shown on the attached plans. The Table Top 1 mile sheet has been completed.

The tentative nomenclature of the succession within the area mapped is as presented in the monthly report for May with one alteration - The Cambrian limestone is now referred to as the Douglas limestone. A considerable area of granite has been mapped on the Tipperary sheet near Fenton and Long Airstrips. Two distinct types - a coarse hornblende biotite granite and a medium grained biotite granite have been recognized. Both appear to be unrelated to the Cullen Granite. The relationship between the two types has not yet been established.

Subdivision of the Lower Proterozoic rocks has been continued. The "Union Slates" referred to in A.G.G.S.N.A. reports are recognized as part of the Burrells Creek Beds. A considerable extent of rocks belonging to the Brock's Creek Beds have been mapped on the Burrundie 1 mile sheet (west section.) The main rock types present are siltstone, greywacke siltstone, carbonaceous siltstone, chert and greywacke. Where the beds have been sheared or attenuated on the limbs of folds, the rocks have been transformed to slates. Otherwise, the degree of metamorphism is very low. The sediments have been intruded by several sills of diorite. The diorite has been folded with the sediments and is considered to be older than the granitic rocks in the area. Small outcrops of limestone have been mapped in the Montacute Peak area.

Old mine workings are being plotted on each 1 mile sheet as the mapping progresses. In each case mineral mined has been recorded and the workings sketched and examined. This information will be passed on to the Resident Geologist Darwin and assist in his preparation of a new mineral map of the region.

Preliminary traverses on the Ban Ban sheet show a repetition of the Brock's Creek Beds on the Mt. Massin Area south of Mt. Douglas. This area is now being prospected. Some prospecting has also been done along the eastern flank of the River Springs Granite but the results of this work were not encouraging. Some further discoveries of small radioactive gossans were made on the B.M.R. Burrundie reservation. A reconnaissance report on the area covered by the reservation has been forwarded to Darwin office.

Sgd. (B.P. Walpole.)
Senior Geologist.

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**INSPECTION OF RADIOACTIVE ANOMALIES IN THE AREA COVERED
BY AUTHORITY TO PROSPECT NO. 69.**

Introduction.

The area covered by Authority to Prospect No. 69 was visited by D.E. Gardner together with Messrs. Goodsir and R.S. Matheson. The radioactive anomalies known in the area were inspected by J.D. Wyatt during February, 1954. It is intended in this report to supplement the geological notes given by Wyatt, and on the basis of the additional information available, to revise the conclusions regarding the source of the radioactivity, and the recommendations for additional work.

Geology.

Steeply dipping shales of the Lower Proterozoic Brock's Creek Group are exposed in a pit about 18 inches deep at locality B described by Wyatt. Elsewhere the shales are covered by ferruginous laterite, Cambrian (?) siliceous sandstone, and derived detritus. The sandstone is intersected by major joints which probably represent minor faulting. It is silicified along the joints, where it is resistant to weathering and forms prominent "reef-like" outcrops. The laterite may have been derived largely from Cambrian basalt, which occurs as scattered detrital fragments near the prospect, and covers a large area to the west of it.

At locality A of Wyatt a highly ferruginous outcrop is intersected by relatively closely spaced, steeply dipping joints. It is possibly an outcrop of Brock's Creek sediments that have become lateritized, and the steeply-dipping planes may represent either bedding or fracturing. The limonite in the steeply-jointed outcrop lacks the granular texture which could be expected in lateritized sandstone. It is capped by angular detrital fragments of sandstone cemented by limonitic material. This appeared at first sight to be a breccia similar to that observed in shear-zones in granite in the Edith River area, but on closer inspection, its detrital nature became obvious.

Radioactivity.

The background count on Austronic Ratemeter No. 76, in the soil-covered ground surrounding the radioactive anomalies, was 80 counts per minute. In a traverse of approximately 1,000 feet from locality A to locality B, counts of 150 to 200 per minute were obtained on scattered outcrops of ferruginous laterite. These were most abundant at locality B. A pit about 18 inches deep showed that the laterite occurs as discontinuous masses within soil overlying steeply dipping shales.

At locality A, a pit 12 inches deep was dug at the eastern edge of the steeply-jointed outcrop. The count at the bottom was approximately 500 per minute, which is reported to be slightly higher than the count at the original surface.

Conclusions and Recommendations.

The radioactivity at locality B is due to a slight concentration of radioactive matter in the ferruginous laterite. This probably applies to the other anomalies reported to occur over a length of $\frac{1}{2}$ mile and a width of a few hundred feet, in lateritic country. These occurrences are of no commercial value.

At locality A, the steeply jointed ferruginous outcrop may represent a fracture-zone in the Brock's Creek sediments and if so,

it may contain a deposit of uranium, epigenetic in origin. A shaft should be put down below the hard ferruginous capping - say, about 15 feet. A short cross cut to the west would enable radiometric testing of the jointed rock beneath the capping.

June, 1954.

D.E. Gardner.

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**RENEWED SEARCH FOR AIRBORNE SCINTILLOMETER ANOMALY
MAUD CREEK, KATHERINE AREA.**

Early in November, 1953, a search was made (Records 1953/136) for the source of a third order radiometric anomaly detected by the airborne scintillometer survey in the Katherine area along Maud Creek, within a mile of its junction with Dorothy Creek. The highest counts then obtained were given by basalt of the Edith River Volcanics, which occupy a broad area around and north of the junction of the two creeks and southwards for nearly $\frac{1}{2}$ mile.

A prominent fault trending a little north of east displaces Upper Proterozoic sandstone of the Mt. Cullen Group, which occurs a short distance east of Maud Creek. It was thought that the radiometric anomaly might be associated with this fault.

An investigation of the general geology, combined with radiometric testing, was made of the country on either side of the creek from the southern end of the area searched in November, 1953 to a point $1\frac{1}{2}$ miles further upstream.

The country rock traversed by the Creek consists of arenaceous and silicified argillaceous sediments of the Lower Proterozoic Brock's Creek Group, in part tuffaceous. They are closely folded and the less competent beds are in places intricately drag-folded.

No signs of metalliferous deposits were found in the area. Quartz veins up to 1 foot thick occur between some of the sedimentary beds, and in the noses of drag folds. They contain no cavities attributable to earlier sulphides. No gossanous outcrops were discovered.

The background count with Austronic Ratemeter No. 76 was 60 per minute in alluvium in the bed of Maud Creek, a few hundred feet north of the fault line. The count obtained on the Brock's Creek sediments was in nearly all localities very close to 80 per minute. Some arenitic tuffaceous beds gave a count of 90. Approximately 1 mile north of the fault line count of 80 to 100 per minute was obtained in sheared or fractured fine-grained beds (siltstones?) outcropping in a gully flowing into Maud Creek from the west. A careful testing of the surrounding area failed to yield a count in excess of 100 per minute, and this was restricted to an area of about 2 square feet in the vertical or steep bank of the gully.

It is concluded that any mineralization associated with the fault is slight, and no significant source of radioactivity occurs in the area examined. The airborne anomaly is possibly associated with the Edith Volcanics, which give a count notably higher than the Brock's Creek beds. This however, may not be the case, as the plane may have flown southwards along Maud Creek valley, viz., from the Edith Volcanics to the Brock's Creek sediments. An attempt will be made to check up on this. At an early opportunity, a more detailed report will be written on the renewed search for the airborne scintillometer anomaly.

June, 1954.

D. E. Gardner.

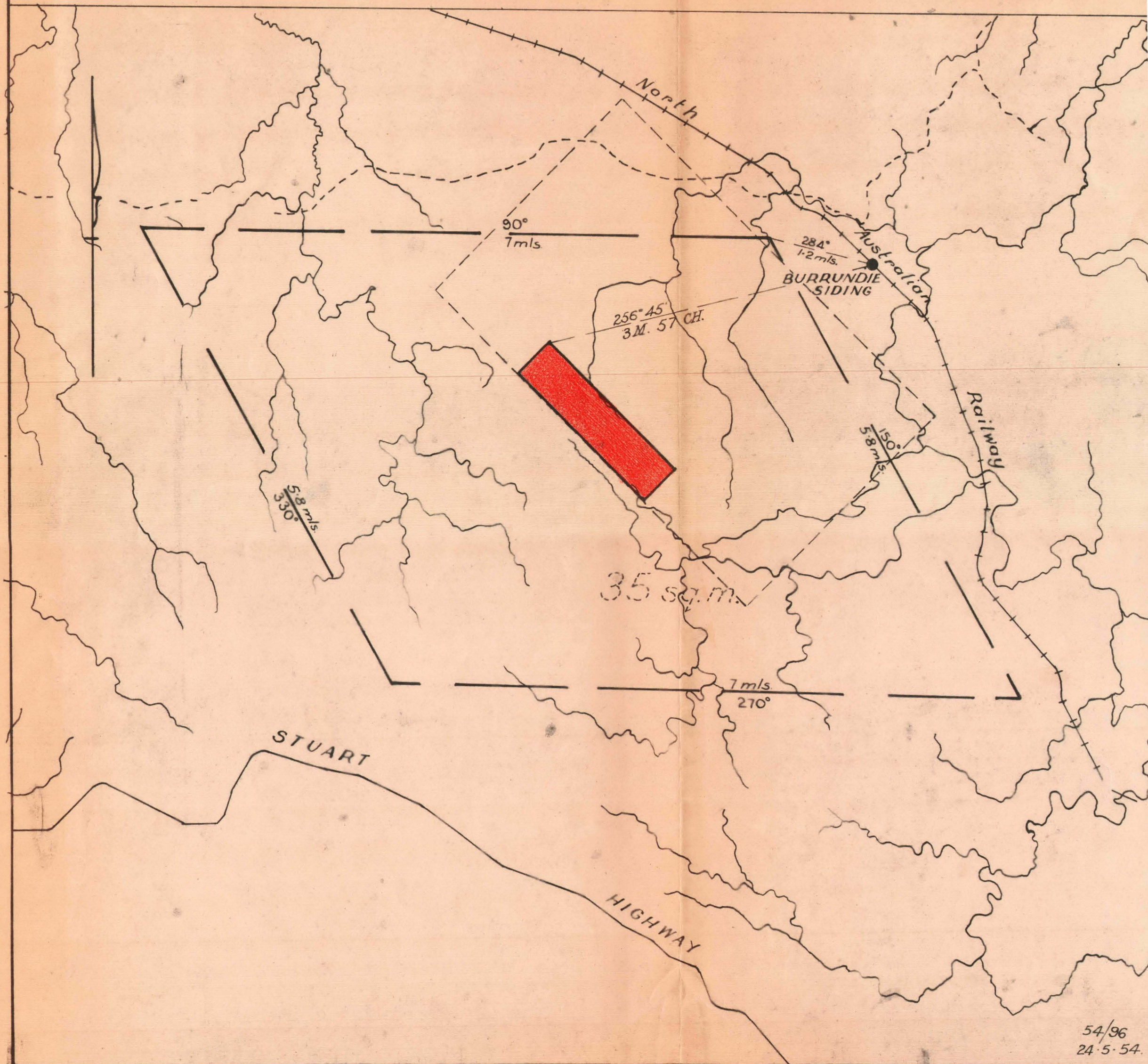
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APPENDIX III URANIUM COMPANIES AND SYNDICATES OPERATING IN
NORTHERN TERRITORY - 30. 6. 54.

Name.	Local Represent- atives or Geologist.	Southern Connections.
Austral Uranium Co., N.L.	H.W.G. Good.	
Australian Mining and Smelting Co.Ltd.	H. Brennan.	Zinc Corp.
Brock's Creek Uranium Co., N.L.	E. McDonald.	
Centralia Mines N.L.		
Central Uranium N.L.		Mr. Goodsir.
Enterprise Exploration Co. Pty. Ltd.	H. Brennan.	Zinc Corp.
Gold Mines of New Guinea.		
Hidden Valley Mining Syndicate.	W. Power.	
North Australian Uranium Corporation.	E. Becker. A.D.M. Bell.	
Northern Mines Development N.L.	K. Summers.	Dr. Garretty.
Northern Territory Prospecting and Development Co. Ltd.		Hopkins.
Northern Uranium Development N.L.	Fisher.	Mott.
Red Ned Gold Mine N.L.	J.S. Higgins.	
Rio Tinto Company.	R.S. Matheson.	
Uranium Corporation of Australia Pty. Ltd.	Trestrail.	Mr. Wharton. Rye Park Scheelite.
Uranium Mines N.L.	W. Keys.	H.J.G. Connelly.
Uranium Oxide N.L.	Jensen.	Austral Mining Co., Poseidon N.L. Pioneer Mines.
Uranium Prospecting and Development N.L.	Coxon & Macdonald.	Mr. R. Sprigg.
Utinium Pty. Ltd.	Pitman.	
Y.M.C. Syndicate.	Young, Maslin & Cousins.	

PROPOSED RESERVE B.M.R

Scale: 1 mile to an inch



RECONNAISSANCE GEOLOGICAL MAP
BURRUNDIE PROSPECT AREA.

