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RECONNAISSANCE GEOLOGICAL REPORT

BURRUNDIE RADIOACTIVE PROSPECT RESERVATION.

by

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C O N T E N T S.

PLATES.		Scale.
1	RECONNAISSANCE GEOLOGICAL MAP. BURRUNDIE AREA. (Not yet available.)	1" = 1 mile approx.
2	RECONNAISSANCE GEOLOGICAL MAP. BURRUNDIE AREA.	1" = ½ mile approx.

Summary.

Small radioactive gossans are associated with strike shears in carbonaceous slates of Lower Proterozoic age. The radioactivity is not strong and the maximum reading was approximately 4 times the background of the beds in which the gossans occur. This may be due to the high degree of leaching which has taken place. Although the gossans are small, the largest should be tested to determine the source of radioactivity and further prospecting of the area is warranted.

Two very large hematite-limonite-rich lodes occur in the area and should be further investigated.

Introduction.

This report deals with the radioactive prospect known as the Burrundie Prospect and with the area surrounding the prospect. Mapping carried out in this area to date (June, 1954) has been of a reconnaissance nature only and the report and the accompanying plans are designed to assist future work of a more detailed character.

Significant radioactivity in the Burrundie area was first discovered on 20th May, 1954, by a party engaged in regional mapping and including geologists B.P. Walpole and J.G. Best. Since that date further anomalies have been located in the area surrounding the initial discovery. The initial discovery is located at latitude 13° 35', longitude 131° 40' (approximately) and is situated on the crest of a razorback ridge 3½ miles on a true bearing of 242 degrees from Burrundie Siding on the North Australia railway line. The relevant aerial photographs are No. 70, 71 and 72, Run 2 of the Burrundie 1 mile area of the Pine Creek Sheet Army ¼ mile series.

Access.

Access to the No. 1 Prospect is by a track which runs south from Grove Hill along Saunders Creek. Other tracks are shown on Plate 2.

Water Supply.

Water for drilling and camp purposes may be obtained from Saunders Creek - point 1, Plate 2.

General Geology.

Meta-sediments, sediments and igneous rocks of Lower Proterozoic age outcrop in the area. The sedimentary sequence consists of two distinctive units which are tentatively referred to as the Brock's Creek Beds and the Burrells Creek Beds. The Burrells Creek Beds consist chiefly of greywacke, and sandstone. The rocks have been tightly folded and are sheared in the zones of most intense folding. In these zones the finer sediments have been transformed to slates. Reports (for which the references are not at present available) by the A.C.G.S.N.A. refer to these rocks as the Union Slates. They are identical in type and occupy the same stratigraphic position as the rocks in the Adelaide River and Burrells Creek area south of Rum Jungle and west of Brock's Creek.

The Burrells Creek Beds overlie the Brock's Creek Beds.

The Brock's Creek Beds in the Burrundie-Grove Hill area consist essentially of siltstone, greywacke siltstone, chert, carbonaceous siltstone and carbonaceous greywacke siltstone, limestone and greywacke. The carbonaceous rocks in some places have been

altered to graphitic schists but in general the degree of dynamic metamorphism of the rocks is very low.

The Brock's Creek Beds are not as tightly folded as the Burrells Creek Beds. In the area of interest the main fold structure is an asymmetrical south-plunging anticline. West of Saunders Creek (Plate 1) the folding is more complex, and closed and overturned anticlines and synclines are present. The Burrundie Prospect region is separated from the domal structure in the Brock's Creek area by a regional axis of pitch change which strikes north-east and which is marked by the Hayes Creek Fault.

The Brock's Creek Beds have been intruded by sills of diorite which have metamorphosed the adjacent beds to hornfels. The sills have been folded with the sediments.

Two granitic bodies intrude the Lower Proterozoic rocks in the area mapped. The northern granite body (Plate 1) is referred to as the Prices Springs Granite and is a contaminated biotitic granite. The southern granite is the Cullen Granite.

Radioactivity.

All significant radioactivity in the Burrundie area discovered up to June 1954, has been in gossanous outcrops and in carbonaceous rocks. The gossans are all similar and are easily recognized in the field. They are limonitic in character and commonly outcrop in saddles on the crests of ridges. The outcropping material is dirty brown in colour and may contain some iron coated kaolin. The gossanous material immediately below the thin ferruginous capping is light in weight and a dirty yellow in colour and has obviously been highly leached.

The ridges on which the gossans are located probably owe their existence as such to silicification of the beds along discontinuous strike shears. Strike shearing also appears to be the main structural control of the gossans.

No attempt has been made by the writer to estimate the dimensions of outcrops of radioactive gossan. Any such estimation based on surface outcrops must be erroneous and a preliminary step in the case of each anomaly should be systematic costeaning in order that the true widths and lengths can be ascertained. Radiometric contouring before such costeaning is carried out is largely dependant on the amount of rubble cover. Background for the area is approximately 60 counts per minute using the Austronic P.R.M. 200 ratemeter.

The following counts were recorded. The figure symbols given each refer to points shown on Plate 2.

Pt.	Surface Counts.	Type of Outcrop.	Counts in Pit at Depth in feet.
2	150 - 200	Gossan.	400 at 5
3	200	Carbonaceous slate.	-
4	150	Gossan.	200 at 1
5	200	Carbonaceous slate.	-
6	175	Dark grey slate	-
7	170	Carbonaceous grey slate.	-
8	130	Slate rubble	150 at 1

Pt.	Surface Counts.	Type of Outcrop.	Counts in Pit at Depth in feet
9	150	Carbonaceous slate rubble.	150 at 1½
10	150	" " "	-
15	125	Carbonaceous slate.	-
16	150	Gossan.	-
17	150	Gossan.	-

The carbonaceous slate horizons give counts of between 75 and 100 per minute. In some places the counts were up to 200 per minute and in two such cases these high readings coincided with the "lines" of strike shearing on which some gossanous material was subsequently found. Some areas in which counts were in excess of 120 per minute, i.e. 2 x background, were tested by shallow pits if the surface was covered by rubble. This practice should be continued during future investigations.

The diorite outcrops give uniformly low counts. The Prices Springs Granite gives counts of from 150 to 160 per minute.

Other Mineralization.

Small copper, lead, gold and tin workings occur in the area surrounding the prospect. All such workings examined are associated with quartz-filled shears which commonly strike north-west. Alluvial tin and gold workings are also scattered throughout the area. The largest working near the Burrundie Prospect is Pickfords Lead Show (Plate 2) on Saunders Creek. The mineralization is localised in a fault zone striking at 320° and dipping 75° to the N.E. Two vertical shafts and two open cuts comprise the main workings and small pits have been sunk on minor cupriferous shears near the main workings.

At point 11 and 12, Plate 2, shafts have been sunk on iron rich bodies. This area has not yet been examined by a geologist.

Of particular interest are the occurrence of two large Brock's Creek type "gossan" lines. The dimensions of these hematite-rich bodies are impressive and are approximately as follows.

No. I length 6500 feet, width 30 feet.
No. II " 3700 " " 50 " .

The widths given above are probably exaggerated as surface rubble obscures the true width in many places. The lodes are only weakly radioactive.

These bodies are probably the surface representation of pyrite mineralization at depth but should be examined more closely. Similar bodies occur associated with shear fractures in the diorite.

Conclusions.

None of the radioactive gossans discovered to date show radioactivity in excess of 4 times background; All are small in size but nevertheless warrant further work to determine the source of the radioactivity. One encouraging feature is that the gossans are in carbonaceous slates and associated with linear zones of higher than normal radioactivity within these slates. The two Brock's Creek type "gossan" lines should be examined more closely. If a decision is made to drill the radioactive gossan on the original prospect, one of these should be tested with a short hole, the position of which should be determined by further geological and geophysical work.

Suggestions for Further Work.

1. The original reservation taken up should be retained at least until the No. 1 prospect is tested or 3 small reservations to include the initial prospect and the "gossan"lines No.'s I and II Plate 2 should be declared.

2. The crest lines of ridges in particular within the reserved area should be more thoroughly prospected. In this regard it is absolutely essential that each prospector should be prepared to pit any area giving radioactivity higher than 120 counts per minute, particularly where such an anomaly is in surface rubble, unless the reason for the activity is clear.

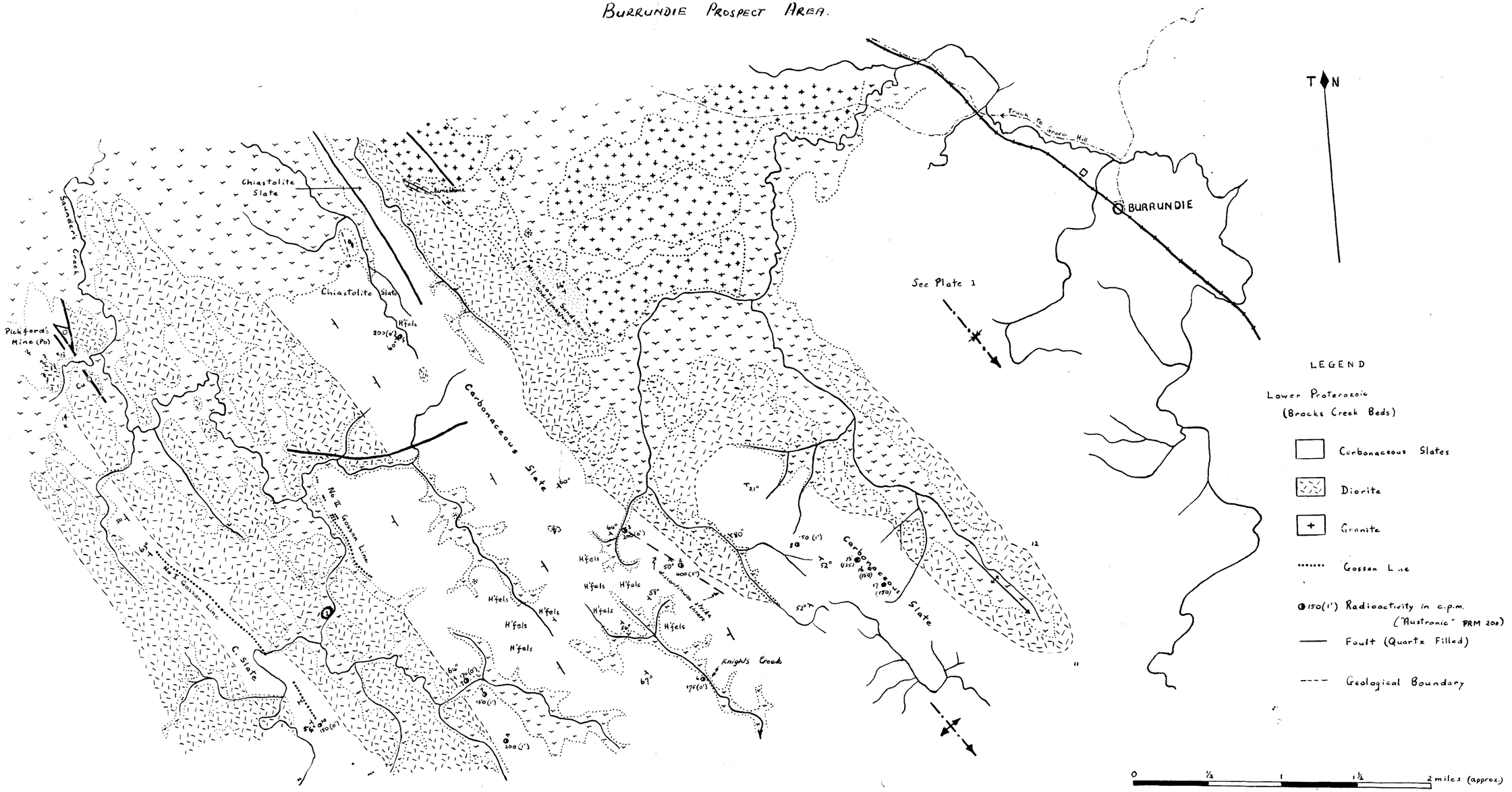
3. Geochemical testing of the No. I and II lines coupled with self-potential work.

4. Reconnaissance geochemical testing for lead at points 13 and 14.

5. The old workings at point 11 and 12 should be tested by probing the shafts and the reason for the workings established.

Plate 2.

RECONNAISSANCE GEOLOGICAL MAP
BURRUNDIE PROSPECT AREA.



Geology by J.R. STEWART June 1954