COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD No. 1963/97

HOWARD SPRINGS RADIOMETRIC INVESTIGATION,

NORTHERN TERRITORY 1952

by

D.F. DYSON

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SUMMARY

Radiometric investigations were made in the vicinity of Howard Springs near Darwin, NT. Tests showed that the high radioactivity readings were due to radioactive material disseminated through the alluvium. The most probable cause of the radioactivity is radon which was derived from within the underlying Precambrian rocks and transported in solution by the spring waters. None of the exposed rock is considered likely to contain an economic source of radioactive minerals.

Recommendations are made for geochemical testing of the spring waters and also a reconnaissance Slingram survey.

1. INTRODUCTION

Howard Springs is about 16 miles east of Darwin, and about 3½ miles north-east of the Stuart Highway. A retaining wall has been built across a small creek which is fed by a spring. The pool thus formed has been developed as a picnic resort. Radioactive samples from the area were submitted by Mr L. Goode of Darwin for testing by the Bureau of Mineral Resources, Geology and Geophysics.

The area was inspected in November 1952, by geophysicist D.F. Dyson of the Bureau. One day was spent on the work.

2. GEOLOGY

The rocks in the area consist of sediments of the Lower Cretaceous Mullaman Group, covered with soil and laterite. The sediments are of unknown thickness, and presumably overlie Precambrian rocks, possibly similar to those which occur in the Rum Jungle district to the south. The rock exposed in the creek bed is porcelanite, which in some areas is clean, and in others carries ferruginous material along joints and cracks. However, most of the creek bed is covered with black soil.

The samples submitted for test were taken from porcelanite exposed in the creek bed. The following are typical results of radiometric assays.

Clean porcelanite, 0.004 percent equivalent U_3O_8

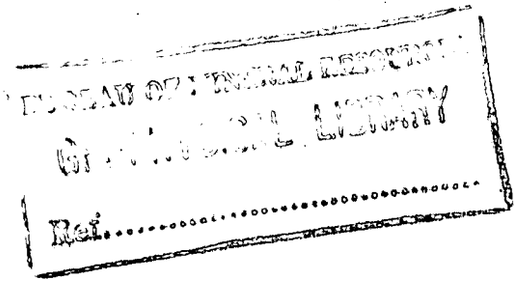
Ferruginous porcelanite, 0.016 percent equivalent U_3O_8.

However, chemical assays showed no detectable uranium. Tests for the presence of thorium were not made.

3. RESULTS

The radioactivity of the area was investigated using a Geiger-Muller ratemeter type 1011.

The strongest indications of radioactivity were obtained at a spot in the creek bed, about 300 yards upstream from the retaining wall. Here, readings of four times background were observed generally on soil in the creek bed, and readings up to nine times background over a small area of exposed porcelanite. Upstream from this area, readings decreased rapidly and were only normal background within a few yards. Farther upstream no abnormal radioactivity was observed. Downstream, radioactivity decreased gradually, but at a distance of about ¼ mile downstream from the retaining wall, readings of 2½ times background were obtained generally over the alluvium in the creek bed. Several pot-holes were sunk to explore the sediments in the creek bed downstream from the wall. As no higher radioactivity was observed on the bedrock, it was concluded that the high readings were due to radioactive material disseminated through the alluvium.



4. DISCUSSION OF RESULTS

None of the exposed rock is worthy of consideration as a possible economic source of radioactive minerals. The most probable cause of the observed radioactivity is radon, which was derived originally from radioactive minerals in the underlying Precambrian rocks and transported to its present position in solution in the water of the spring.

Radioactive spring waters occur in several countries, and are discussed by Genser (1933) and Kuroda, Damon,& Hyde (1954). They appear to be of two types. One carries radioactive minerals in suspension, and is generally derived from granite. The other carries radon in solution, and may be derived from a lode deposit carrying radioactive mineralization. Howard Springs appears to be of the second type, and the possibility that it arises from a radioactive source of economic importance in the underlying rocks is worthy of some investigation.

The association of uranium with sulphide mineralization has proved a useful guide to exploration in the Rum Jungle district, and it could form the basis of a test survey at Howard Springs. If a survey using electromagnetic methods gives indications of the presence of good conductors in the bedrock close to the spring, testing of these by drilling would be warranted. The value of such indications would be strengthened if the spring waters can be shown to carry abnormal amounts of base metals in solution.

5. RECOMMENDATIONS

It is recommended that :

(a) geochemical tests be made to determine if the spring waters contain an abnormal amount of base metals,

(b) a reconnaissance survey using the Slingram method be made around the spring to search for evidence of the presence of good conductors in the bedrock.

6. REFERENCES

GENSER, C.	1933	Radioaktive Heilquellen in Deutschland. Z. dtsch. geol. Ges. 85, 482
KURODA, P.K., DAMON, P.E., and HYDE, H.I.	1954	Radioactivity of the spring waters of Hot Springs National Park and vicinity in Arkansas. Amer. J. Sci. 252,(2) 76-86.