

RESTRICTED

RB 42

G S
47

Copy No. 3 of 7 Copies

D.M. 2389/53.

SR 11/2/70

DEPARTMENT OF MINES.

SOUTH AUSTRALIA.

OPEN FILE

RB 42

NORTH EAST URANIUM EXPLORATION

CROCKER WELL AREA.

PRELIMINARY GEOLOGICAL REPORT

on

THE SPRING HILL DAVIDITE PROSPECT.

by D. KING
GEOLOGIST.

Report No. C.W. 17.

Prospect No. UP 108.

MICROFILM

TABLE OF CONTENTS

SUMMARY

INTRODUCTION

SITUATION

PLANS AND ILLUSTRATIONS

GEOLOGY

THE ORE MINERAL

SIZE AND GRADE

RECOMMENDATIONS

PROPOSED DIAMOND DRILLING.

SUMMARY.

A detailed geological examination of the Spring Hill Prospect has confirmed the presence of a limited area of promising grade davidite mineralisation. The main concentrations of davidite are found as isolated outcrops within an area measuring 11,000 square feet, where coarse-grained aggregates and veinlets of the mineral occur as fracture fillings in partly brecciated hybrid granite and metasedimentary gneiss. Outcrops of the mineralised rocks constitute twenty per cent of this area, the remainder being largely covered by soil and alluvium.

The ore mineral assays 6.51 per cent U_3O_8 .

Channel samples of the largest outcrop of mineralised rock showed on radiometric assay an average U_3O_8 content of 7 lbs. per long ton. This figure can only be regarded as an approximation of the true grade due to the small bulk of the samples in relation to the coarseness and irregular distribution of the ore mineral.

The deposit is located on the brow of a rise where open cut mining could be suitably adopted.

The surface exposures in the main area of mineralisation are considered to be sufficiently attractive to justify additional testing of the deposit, and two 200 ft. diamond drill holes are proposed which would be sufficient to permit an accurate appraisal of the prospect. The cost of this programme would amount to approximately £1,000.

INTRODUCTION.

The presence of an abnormally radioactive area at Spring Hill, on Glenorchy Station, was discovered and reported to the Mines Department by the wife of the Station overseer, H. Talbot, in November, 1953. Mrs. Talbot pegged the area under Miner's Right No. 9637, and lodged an application for geological inspection and consideration for a Government reward.

The area lies several miles within the north-western corner of the Radium Hill Uranium Reserve, which is at present reserved from the operations of the Mining Act.

The detailed geological survey of the area described herein was carried out on 26-27th November, 1953, with assistance of D. Thatcher (Assistant Geologist).

SITUATION.

Located on the northern slopes of Spring Hill, in Toweroo Bore Paddock, Glenorchy Station, the site is approximately twelve miles N.N.W. by rough track from Glenorchy homestead, which is eight miles north of the Mines Department camp at Crocker Well.

Details of the access track from Crocker Well are indicated on the Locality Plan (Fig. 1).

PLANS AND ILLUSTRATIONS.

- | | | |
|---------|--------------------------------------|--|
| Fig. 1. | U.S. 296 | Locality Plan. |
| Fig. 2. | U.S. 267 | Detailed Geological Plan showing proposed boresites. |
| Fig. 3. | Photographs of the uranium prospect. | |

GEOLOGY.

Spring Hill is an outlying hill of Archean rocks along the north-western margin of outcropping Pre-Cambrian rocks of the Plumbago-Glenorchy area, where they terminate against the southern boundary of the Lake Frome Plains. A few miles to the west, Proterozoic Adelaide System rocks unconformably overlie the basement to form the Toolaby Hills.

The Archean rocks in the mineralised area are dominantly metasedimentary micaceous schists and gneisses representing the Kalabity Series. These are locally intruded or replaced by small isolated bodies of pale pink leucogranite and related pegmatite dykes.

Bedding in the metasediments can locally be observed striking E-W., with a steep northerly dip, but generally the bedding is obliterated by a superimposed foliation caused by shearing. The shear foliation (schistosity) trends in a variable N.N.E.-N.E. direction and dips at a steep angle to the north-west.

The granitic rocks are affected by shearing at the margins of the outcrops.

The dauidite mineralisation is localised in highly fractured hybrid granite and granitised metasediments which are unusually deeply weathered and distinctive in outcrop due to a superficial staining of yellow-brown iron oxides. The ore mineral is found mainly within an area of half an acre, wherein the mineralised outcrop and individual veinlets are distributed with no apparent regularity. Narrow and isolated veinlets of dauidite were mapped 150 feet west of the main area, and there are local points of abnormal radioactivity in coarse biotite clots over a wide area surrounding the deposit.

The dauidite occupies fissures which appear to have formed as partial brecciation during shearing, and less commonly it is found in joint planes. The deposit is considered to be of pegmatitic type, deposited from highly mobile mineralising solutions or gases at a late stage of granite emplacement or granitisation.

THE ORE MINERAL.

The ore mineral is steel grey metallic dauiditic-ilmenite, superficially stained with carnotite, resembling in appearance Radium Hill ore. It usually occurs in the form of coarse-grained aggregates associated with bronze biotite in irregular veinlets

and segregations measuring up to several inches in width. At one place (coords. 190N.-390W.) the davidite occurs as pseudo-crystalline aggregates in a pegmatitic quartz vein.

A chemical assay of the hand-picked daviditic-ilmenite gave 6.51% U_3O_8 .

Detrital davidite occurs abundantly in the soil near the mineralised outcrops, and abnormal radioactivity due to its presence can be traced downstream for several hundred feet to the north of the prospect.

SIZE AND GRADE.

The area of importance as a uranium prospect is roughly triangular in ground plan, covering 11,000 square feet bounded by coordinates 385N.-250W., 300N.-120W. and 215N.-250W. Here the ore-bearing rocks comprise ten separate outcrops each of the order of 150 to 200 square feet in size and amounting to 20 per cent of the total area. The remainder is largely covered by alluvium as shown by the following estimation from the geological plan:-

	<u>Square feet</u>
Mineralised outcrops	1,950
Barren country rock	2,800
Alluvium	<u>6,250</u>
Total area	11,000 square feet.

This cross-section of the deposit at the surface is expected to be typical of the mineralisation to a considerable depth, with the possibility of an improvement if the alluviated areas are underlain by ore-bearing rock.

Grade:- As a preliminary measure of the ore grade, the largest exposure of the mineralised rock was chosen as being representative of the deposit generally, and repeat bulk channel samples - each of approx. 10 lbs. weight - were taken along a 25 ft. line extending from coords. 350N.-230W. to coords. 370N.-245W. These gave the following results on

radiometric assay:-

Sample U4/1399	10.1 lbs. U_3O_8 per long ton	} average 7.0 lbs.
Sample U4/1400	3.9 lbs. U_3O_8 per long ton	

The considerable variation in the assays illustrates the unreliability of the small-scale surface sampling. The average figure of 7 lbs. per long ton can therefore only be treated as an approximation of the true grade.

RECOMMENDATIONS.

The deposit located on the crest of a high hill is suitably situated for open-cut mining on a take-all basis, in which case the total area of 11,000 square feet would yield approximately 1,000 tons of ore per vertical foot of depth. Additional sampling beneath the alluviated areas is necessary before an assessment can be made of the weighted assay of this body of rock, and diamond drilling would be desirable for this purpose.

If, contrary to expectations, the uranium values are restricted to the rocks which outcrop, the weighted assay for the whole area would be of the order of one pound U_3O_8 per ton. This figure can be regarded as extremely conservative.

PROPOSED DIAMOND DRILLING.

Two sites for diamond-drill holes have been pegged at the deposit (vide U.S. 267) as a means of testing the main area of mineralisation described in this report. Details of the proposed bores are as follows:-

- D.D. Site 1 - Coords. of Collar 394N.-241W. A 200 ft. borehole directed magnetic south at an inclination of 45° .
- D.D. Site 2 - Coords. of Collar 413N.-178W. A 200 ft. borehole directed magnetic south at an inclination of 45° .

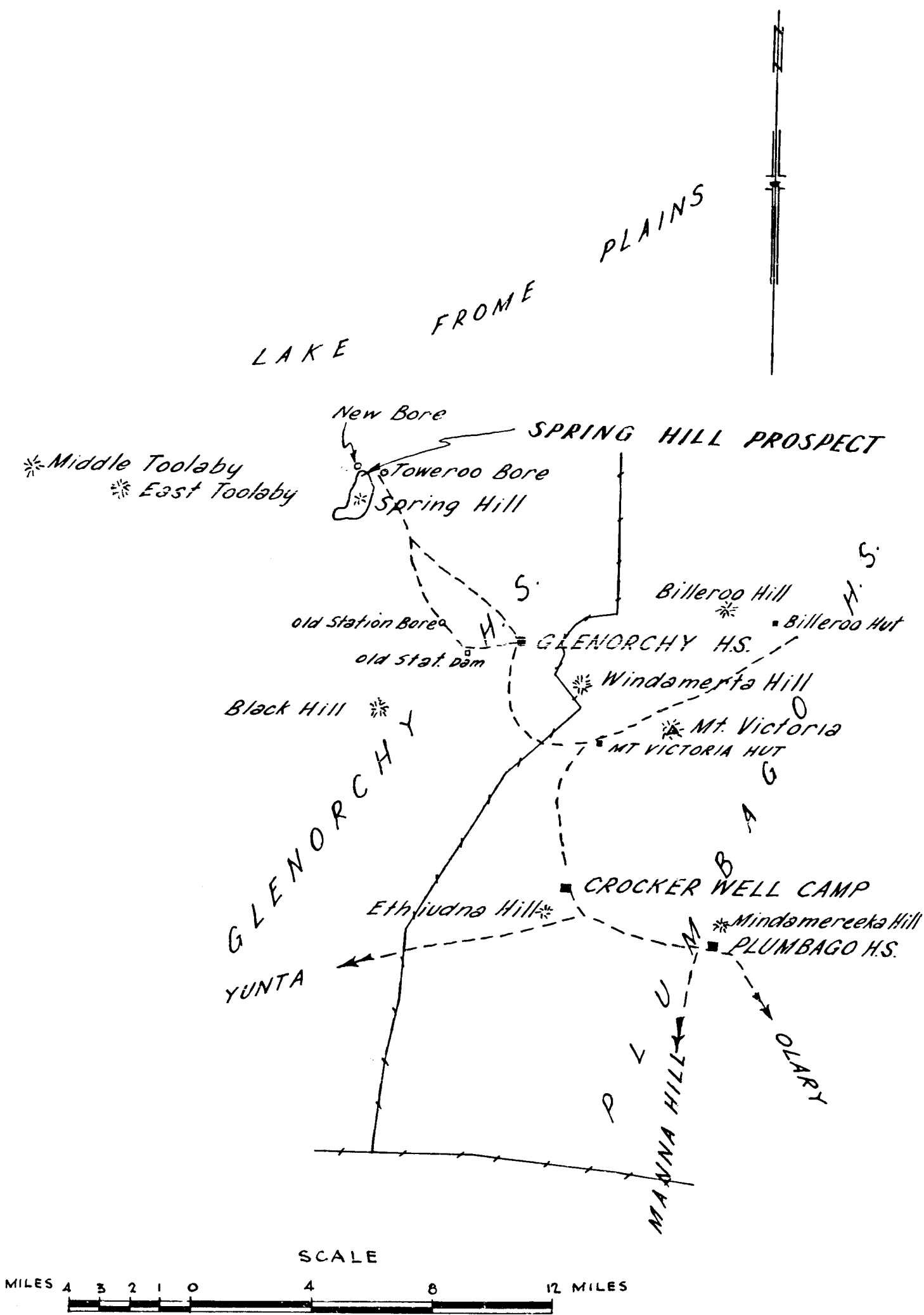
The inclined holes were preferred because of the steep attitude of the mineral veins and rock structures. The programme is designed to provide a representative cross-section

of the area and sufficient sample material for an accurate appraisal of the deposit. The cost of drilling would be approximately £1,000, at £2/5/- per foot, and allowing £100 for transport.

Water required for boring can be obtained within half a mile of the site from the tank at Toweroo Bore, but it will probably be necessary to cart the limited requirements of domestic water from Crocker Well.

D. King
(D. KING)
GEOLOGIST.

DK:AGK
1/4/54.



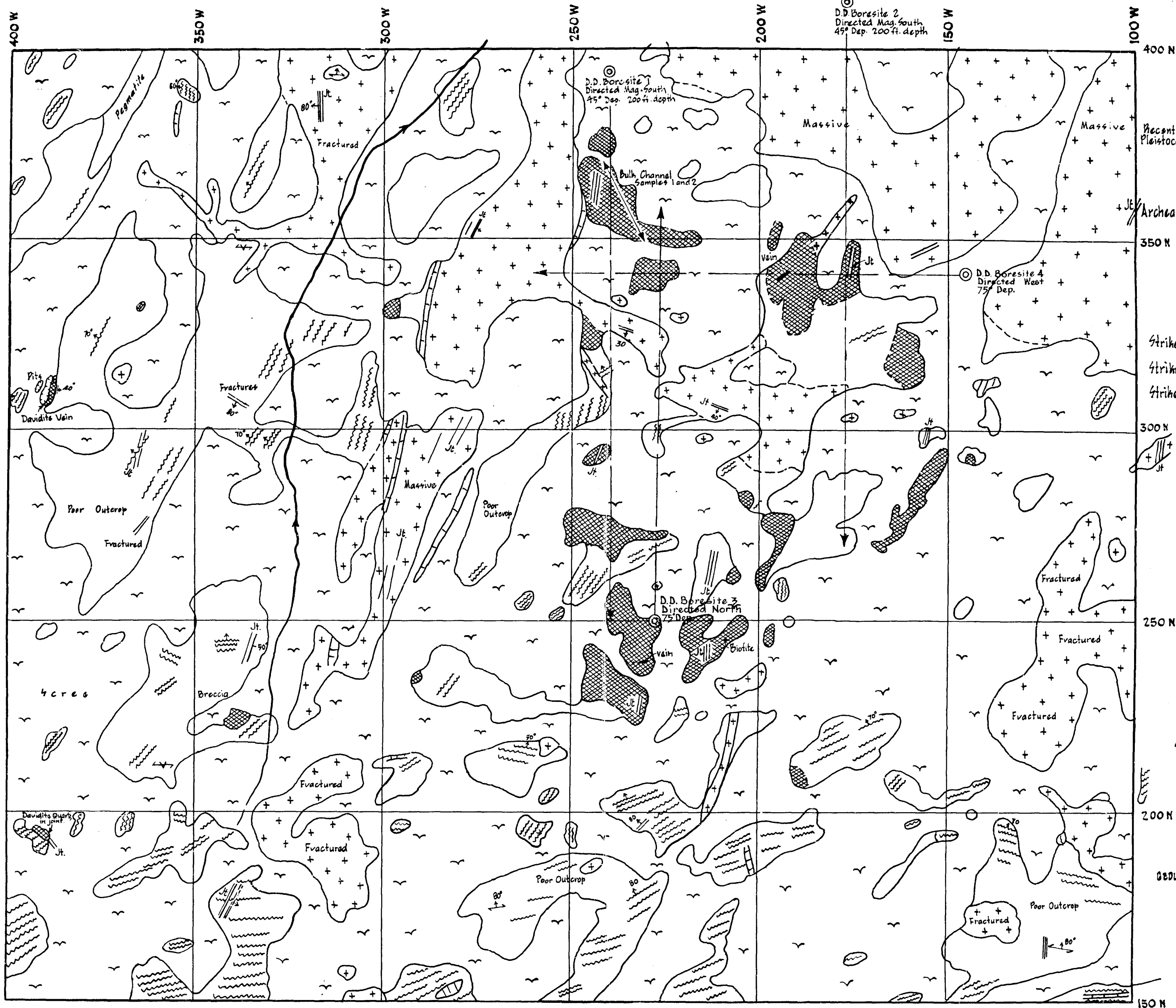
To accompany report by D. King

S.A. DEPARTMENT OF MINES					
Approved	Passed	Drn.	LOCALITY PLAN SPRING HILL URANIUM PROSPECT	D.M. <u>2389</u>	Scale <u>4 miles to 1"</u>
		Tcd. <u>J. McD</u>		Req. <u>5</u>	SU.S. 296
		Ckd. <u>R.R.</u>			
Director		Exd.			Date <u>24-3-54</u>

No.		
Amendment		
Exd.		
Date		

S. A. DEPT. OF MINES		
CROCKER WELL URANIUM FIELD		
SPRING HILL PROJECT		
(GLENNORCHY 47M.)		

Director	Approved	Passed	Scale: 20' to 1"
B.S.G.			44267
Per. R.R.			
Exd.	Dim.	Tcd.	Fd (66)
Date: 4-1-54			



LEGEND

- Recent & Pleistocene
- Clay Soil Alluvium
- Pegmatite
- Leucogranite
- Archean
- Sedimentary Schist Gneiss & Migmatite
- Daviditic-ilmenite mineralization (veins) in fractured granite and Migmatite
- Strike and Dip of Schistosity
- Strike and Dip of Bedding Foliation
- Strike and Dip of Joints

M. N.



SCALE - 20 Feet to 1 inch

GEOLOGY AND SURVEY BY D. MING
1954

SPRING HILL DAVIDITE PROSPECT.

FIG. 3.



(a) General view of the mineralised area with outcrop rich in davidite in foreground.



(b) Close-up of typical vein of daviditic-ilmenite.