RESTRICTED

D.M. 2389/53.

RB 314

DEPARTMENT OF MINES.

SOUTH AUSTRALIA.

(20 = 1")

# NORTH-EAST URANIUM EXPLORATION.

## CROCKER WELL AREA.

## REPORT ON COMPLETION OF DIAMOND DRILLING AT THE SPRING HILL DAVIDITE PROSPECT.


- BY -

D. KING

GEOLOGIST.


REPORT NO. C.W. 25.

PROSPECT NO. U.P.108.



10

## I. SUMMARY.

Four diamond drill holes sunk into this deposit have shown that the davidite-bearing rocks exposed at the surface are remnants of a flat-pitching mineralised fracture zone in hybrid granite. The deposit is underlain by an extensive body of massive and barren granite.

The amount of davidite ore obtainable by open excavation would be of the order of 1,000 long tons, of grade varying from 1 to 10 pounds $U_3O_8$ per ton.

The results of the drilling do not justify any further exploration.

## 2. INTRODUCTION.

The uranium prospect at Spring Hill was discovered by private prospector Mrs. M. E. J. Talbot in November, 1953. A preliminary geological report on the deposit was submitted on the 1st of April, 1954, (Report No. C.W. 17 — King), in which recommendations were made for further testing of the deposit by diamond drilling. A uranium discovery reward was subsequently granted to Mrs. Talbot by the Government.

## 3. PLANS.

U.S.267 Detailed Geological Plan showing Location of Diamond Drill Boreholes.

U.S.435 Geological Cross-Sections along Boreholes.

## 4. SURFACE GEOLOGY.

The ore mineral davidite occurs as coarse-grained aggregates and veinlets in partly brecciated hybrid granite and granitised metasediments. The mineralised outcrop ore unusually deeply weathered and distinctive due to a superficial gossany staining of iron oxides.

The davidite is mainly concentrated within an area measuring 11,000 square feet, wherein the mineralised outcrops and individual veinlets are distributed with no apparent regularity.

## 5. DIAMOND DRILLING.

A total of four diamond drill holes have been completed at the deposit as a means of systematically testing the main area of mineralisation to a depth of up to 100 feet vertically.

In the absence of any regular surface structure, the initial boreholes Nos. S.H.1. and S.H.2 were designed on the assumption that the mineralisation is steeply dipping concordant with the enclosing metasedimentary rocks. These holes intersected only barren granite. Two additional boreholes Nos. S.H.3 and S.H.4 were subsequently drilled in

anticipation of a shallow pitch to the south or east.

The location of diamond drill-hole sites is shown on the detailed geological plan (U.S.267) and geological cross-sections along the boreholes on plan U.S.435. Bore logs with assay data are appended to this report.

Details of the boreholes are as follow:—

| BORE NO. | COORDINATES OF COLLAR | DIRECTION | DEPRESSION | DEPTH (feet) |
|---|---|---|---|---|
| S.H.I. | 393N:241W | south | 45° | 200 |
| S.H.2. | 412N:177W | South | 45° | 100 |
| S.H.3. | 250N:227½W | North | 75° | 80 |
| S.H.4. | 341N:145W | West | 75° | 140 |

## 6. ORE RESERVES.

In the preliminary appraisal of the deposit (Report C.W.17), it was estimated that the mineralised outcrops amounted to at least twenty percent of a total area of 11,000 square feet — of which a large proportion was covered by alluvium. Surface samples of the mineralised rock assayed from 4 to 10 pounds $U_3O_8$ per long ton.

The diamond drilling programme provided the following additional information on ore reserves and grade:—

| Bore No. | ORE INTERSECTIONS From (Ft. Ins.) | To (Ft. Ins.) | GRADE $U_3O_8$ pounds / long ton Radiometric | Chemical |
|---|---|---|---|---|
| S.H.I. | nil | | - | - |
| S.H.2. | nil | | - | - |
| S.H.3. | 0 - 0 | 4 - 0 | 1.6 | 1.5 |
| | 4 - 0 | 5 - 0 | 9.2 | 8.7 |
| | 5 - 0 | 9 - 0 | 1.8 | 1.8 |
| | 9 - 0 | 10 - 2 | 7.6 | 7.4 |
| | 10 - 2 | 17 - 0 | 2.4 | 2.1 |
| | overall 17 feet at 2.6 pounds $U_3O_8$ per ton (Chemical). | | | |
| S.H.4. | 95- 6 | 96 - 4 | 2.0 | |
| | 96- 4 | 99 - 4 | | |
| | 99- 4 | 100 -10 | | |
| | 100-10 | 103 - 6 | | |
| | 103- 6 | 103- 10 | | |
| | Overall 8'4" at 1.4 pounds U308 per ton (radiometric). | | | |

The drilling results indicate that the mineralisation is flat-lying and sporadic with the deposit underlain at shallow depth by an extensive body of barren granite. The shallow pitch — which is to the south-east at an angle of 5° - 15° — accounts for the apparent lack of structure in the surface exposures.

The ore reserves available by shallow excavation would be of the order of 1,000 tons.

## 7. ORE MINERALS.

The chief ore mineral is coarse grained grey metallic davidite-ilmenite stained with carnotite, and assays 6.5 per cent uranium oxide. It occurs in intergrowth with coarse bronze biotite.

Clusters of small yellow grains of thoro-brannerite were found associated with rutile and davidite in borehole samples (vide detailed log of D.D. hole S.H.4).

## 8. RECOMMENDATIONS.

Drilling operations have been suspended and no further exploratory work is justifiable on the basis of the results obtained.

The prospect would provide a small tonnage of ore by open-cutting which may be amendable to treatment at Radium Hill.

D. King

D. KING

GEOLOGIST.

DK/JA

10/9/54.

DEPARTMENT OF MINES, ADELAIDE

# DIAMOND DRILL LOG

Project SPRING HILL PROSPECT. DM 2389/53.

Bore No. S.H.1. Bore Serial No. DD 55/54.

Hundred - Section - Plan Reference U.S.267

Co-ordinates 393N : 241 W. R.L. of Collar -

Bearing Magnetic South Depressed 45° Driller M. Stack

Date Drilling commenced Date Drilling completed

## LOG

| Depth From Ft. | Depth From In. | Depth To Ft. | Depth To In. | Core Recovered Ft. | Core Recovered In. | |
|---|---|---|---|---|---|---|
| 0 | 0 | 13 | 0 | - | - | Hybrid granite - irregularly distributed biotite |
| 13 | 0 | 51 | 10 | - | - | Massive pegmatitic leucogranite |
| 51 | 10 | 200 | 0 | - | - | Fine-medium biotite granite. Massive, with some jointing at 15°. |

NO ORE INTERSECTIONS

Bore abandoned at 200 feet.

ASSAYS

No samples submitted for assay.

Bore logged by D. King.

50blks50—6.53 3341

Date 6/7/54.

DEPARTMENT OF MINES, ADELAIDE

# DIAMOND DRILL LOG

Project SPRING HILL PROSPECT. DM 2389/53.

Bore No. S.H.2. Bore Serial No. DD 61/54.

Hundred - Section - Plan Reference U.S.267

Co-ordinates 412N. - 177 W. R.L. of Collar -

Bearing Mag. South Depressed 45° Driller M. Stock

Date Drilling commenced Date Drilling completed

## LOG

| Depth From Ft. | Depth From In. | Depth To Ft. | Depth To In. | Core Recovered Ft. | Core Recovered In. | |
|---|---|---|---|---|---|---|
| 0 | - 0 | 100 | - 0 | | | Uniform medium-grained leucogranite.<br>No ore intersections.<br><br>Bore abandoned at 100 feet. |

ASSAYS.

No samples submitted for assay.

Bore logged by D. King

50blks50—6.53 3341

Date 26/7/54.

DEPARTMENT OF MINES, ADELAIDE

# DIAMOND DRILL LOG

Project SPRING HILL PROSPECT — DM 2389/53.

Bore No. S.H.3. — Bore Serial No. DD 63/54

Hundred - — Section - — Plan Reference U.S.267

Co-ordinates 250N: 227½W — R.L. of Collar -

Bearing Mag. north — Depressed 75° — Driller M. Stock

Date Drilling commenced — Date Drilling completed

## LOG

| Depth From Ft. | Depth From In. | Depth To Ft. | Depth To In. | Core Recovered Ft. | Core Recovered In. | |
|---|---|---|---|---|---|---|
| 0 | 0 | 4 | 0 | | | Granite with traces of biotite and davidite in fissures. |
| 4 | 0 | 5 | 0 | | | Numerous davidite veins in fractured granite. |
| 5 | 0 | 9 | 0 | | | Leucogranite. Some small fissures carrying davidite. |
| 9 | 0 | 10 | 2 | | | Numerous davidite veins in fractured granite |
| 10 | 2 | 17 | 0 | | | Leucogranite. Some fissures with davidite and other radioactive minerals. Sample for Min. Report from 15'9". |
| 17 | 0 | 80 | 0 | | | Medium grained massive leucogranite. |
| | | | | | | END OF BORE AT 80'-0". |

| FOOTAGE From Ft. | From In. | To Ft. | To In. | THICKNESS Ft. | THICKNESS In. | ASSAYS Sample No. | $U_3O_8$ Radiometric | pounds/long ton. Chemical |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 4 | 0 | 4 | 0 | U4/4960 | 1.6 | 1.5 |
| 4 | 0 | 5 | 0 | 1 | 0 | U4/4961 | 9.2 | 8.7 |
| 5 | 0 | 9 | 0 | 4 | 0 | /4962 | 1.8 | 1.8 |
| 9 | 0 | 10 | 2 | 1 | 2 | /4963 | 7.6 | 7.4 |
| 10 | 2 | 17 | 0 | 6 | 10 | U4/4964 | 2.4 | 2.1 |

Bore logged by D. KING

50blks50—6.53 3341

Date 8/7/54.

DEPARTMENT OF MINES, ADELAIDE

# DIAMOND DRILL LOG

Project SPRING HILL PROSPECT. DM 2389/53

Bore No. S.H.4 Bore Serial No. DD 66/54

Hundred Section Plan Reference U.S.267

Co-ordinates 341N - 145W R.L. of Collar -

Bearing Mag. West Depressed 75° Driller M. Stock

Date Drilling commenced Date Drilling completed

## LOG

| Depth From Ft. | Depth From In. | Depth To Ft. | Depth To In. | Core Recovered Ft. | Core Recovered In. | |
|---|---|---|---|---|---|---|
| 0 | 0 | 39 | 0 | - | - | Medium-grained leucogranite. Biotite in joint fissures from 17'-9 to 19'-6". |
| 39 | 0 | 95 | 6 | - | - | Medium-grained leucogranite. |
| 95 | 6 | 103 | -10 | | | Lode. Leucogranite with numerous biotite clots and associated rutile - Thorobrannerite. Traces of torbernite staining. Sample from 99' and 103'-9" identified by Petrologist as thorobrannerite intergrown with rutile. (Pet. Lab. report 58/54.) |
| 103 | 10 | 122 | 0 | | | Medium grained leucogranite. |
| 122 | 0 | 140 | 0 | | | Medium grained leucogranite. Few small grains of slightly radioactive rutile. Sample from 125'. Identified by Petrologist as rutile, with associated biotite, chlorite and zircon. |

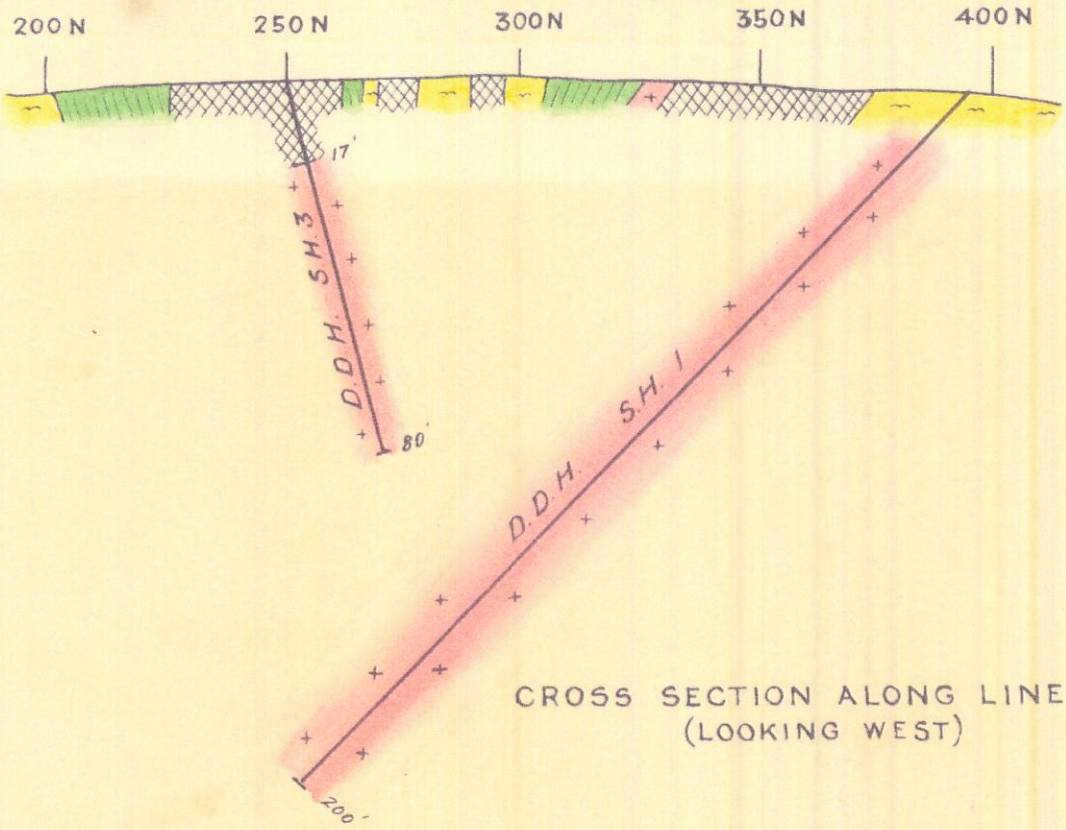
END OF BORE AT 140 feet.

| FOOTAGE Ft. | FOOTAGE In. | FOOTAGE Ft. | FOOTAGE In. | THICKNESS Ft. | THICKNESS In. | SAMPLE NO. | ASSAYS $U_3O_8$ pounds / long ton. Radiometric | ASSAYS $U_3O_8$ pounds / long ton. Chemical |
|---|---|---|---|---|---|---|---|---|
| 95 | 6 | 96 | 4 | 0 | 10 | U4/4984 | 2.0 | - |
| 96 | 4 | 99 | 4 | 3 | 0 | 4985 | 1.1 | - |
| 99 | 4 | 100 | 10 | 1 | 6 | 4986 | 0.3 | - |
| 100 | 10 | 103 | 6 | 2 | 8 | 4987 | 0.6 | - |
| 103 | 6 | 103 | -10 | 0 | 4 | 4988 | 13.9 | - |

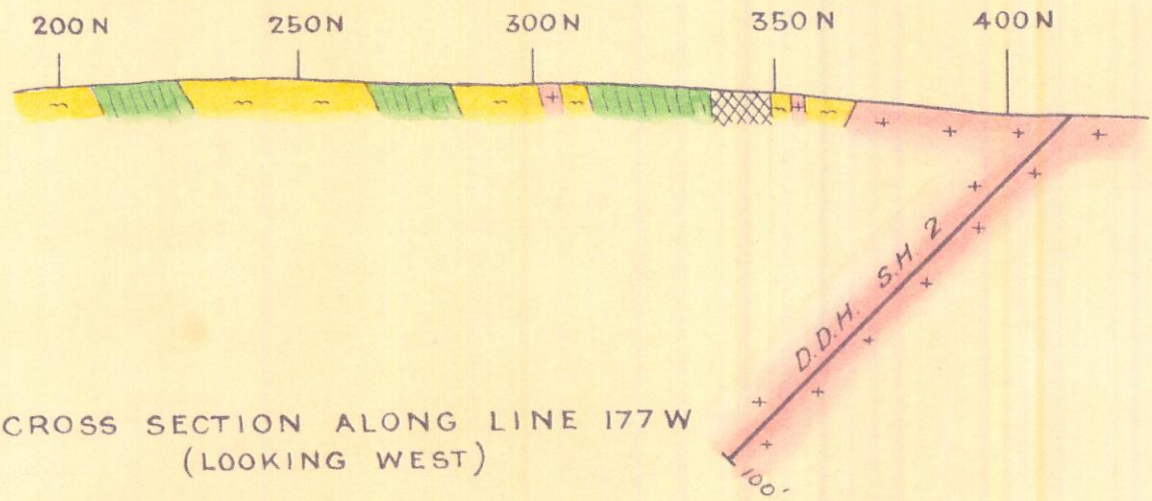
Bore logged by D. King

50blks50—6.53 3341

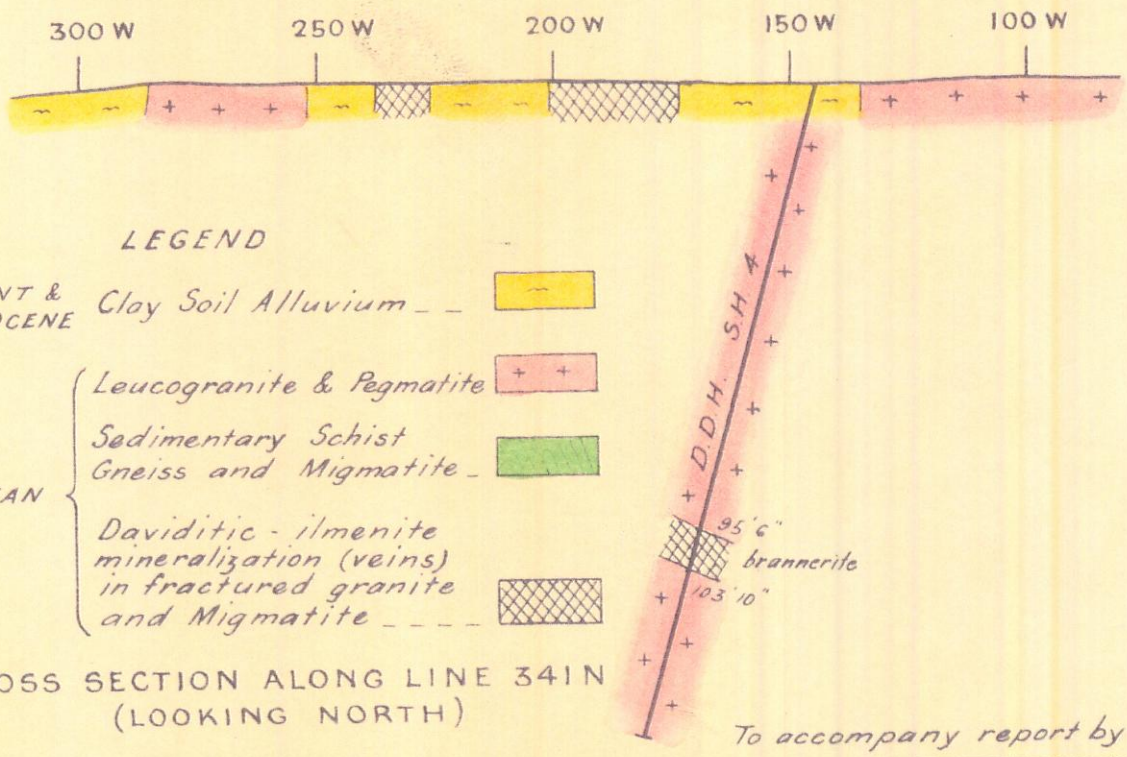
Date 10/8/54.




CROSS SECTION ALONG LINE 230W
(LOOKING WEST)




CROSS SECTION ALONG LINE 177 W
(LOOKING WEST)




LEGEND

RECENT & PLEISTOCENE — Clay Soil Alluvium

ARCHEAN
- Leucogranite & Pegmatite
- Sedimentary Schist Gneiss and Migmatite
- Davidite - ilmenite mineralization (veins) in fractured granite and Migmatite

CROSS SECTION ALONG LINE 341N
(LOOKING NORTH)

To accompany report by D. King

S. A. DEPT OF MINES

| | | | | | |
|---|---|---|---|---|---|
| Approved | Passed | Drn. DK / RR | SPRING HILL DAVIDITE PROSPECT<br>GEOLOGICAL CROSS SECTIONS ALONG D.D. HOLES | D.M. 2389/53 | Scale 40 feet to 1 inch<br>US 435<br>Date 10.9.54 (Z) |
| Director | C.D. | Fld. | | | |

S.A.G. DEPT OF MINES

RADIUM HILL

# VERTICAL CROSS SECTION 6800 N

(1200 E — 200 W)

Scale 1" = 40'

UR-267

1200 E
1100E
1000 E
900 E
800 E
700 E
600 E
500 E
400 E
300 E
200 E
100 E
00
100 W
200 W

RL 4300
RL 4400
RL 4500
RL 4600
RL 4700
RL 4800
RL 4900
RL 5000
RL 5100
RL 5200

UR-267