COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

RECORDS.

1953/124.

PROGRESS REPORT ON THE CORONATION HILL PROSPECT AT 31ST OCTOBER, 1953.

by

R. S. MATHESON.

CANBERRA.

PROGRESS REPORT ON THE CORONATION HILL PROSPECT

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R. S. Matheson.

RECORDS 1953/124.

Coronation Hill Prospect

Conclusions

Plate No.	Plans	Scale
1	Reconnaissance Geological Map Coronation Hill-Goodparla Area	1" = 1.5 miles (approx.)
2	Geological Sketch Map Coronation Hill Prospect	1" = 100 feet
3	Radiometric Profiles of Costeans and Assay Values	1" = 10 feet
4	Cross Section No. 1 Diamond Drill Hole	1" = 40 feet
5	Cross Section No. 2 Diamond Drill Hole	1" = 40 feet
6	Radiometric Logs No. 1 Diamond Drill Hole	1" = 20 feet
7	Radiometric Logs No. 2 Diamond Drill Hole	1" = 20 feet

PROGRESS REPORT ON THE CORONATION HILL PROSPECT AT 31ST OCTOBER, 1953.

R. S. MATHESON.

RECORDS 1953/124.

This prospect, which is situated near the headwaters of the South Alligator River on a bearing of 109 degrees and about 24 miles distant from Goodparla Homestead, was discovered by Geologist, B. P. Walpole, on 2nd June, 1953.

Following its discovery detailed geological and geophysical investigations were undertaken as well as costeaning and diamond drilling.

The radioactive anomaly occurs on the northern slope of Coronation Hill between cliffs of Buldiva quartzite to the south, and a copper-bearing quartz-filled shear 600 feet farther north, which strikes in a westerly direction. Sediments of the Buldiva Group of Upper Proterozoic age occur to the north of the quartz-filled shear and appear in the light of present information to be down-faulted.

Geophysical work has shown that the anomaly at the surface gives Geiger readings of from 125 to 175 counts per minute over an area of about 50,000 square feet, within which are some local high spots with readings up to a maximum of 700 counts per minute. The background reading for the area is 50 counts per minute.

Chloritic schists and slates, which strike in a north-westerly direction and dip about 65 degrees southwest, occur as a discontinuous outcropping belt along the north eastern side of the anomaly, and also outcrop sporadically on the hill slope further to the south-east. The age of these rocks is uncertain but the writer tentatively regards them as belonging to the Brocks Creek Group of Lower Proterozoic age. He also considers that the quartz injection into the shear is of Lower Proterozoic age, but that it is probable that further movement occurred on it in post-Buldiva times.

The south-western side of the anomaly occupies an area which is extensively covered by soil and scree, but pit sinking and costeaning has shown that a kaolinised angular conglomerate or bredcia occurs as the underlying rock. Slate and quartzite fragments are present in the breccia and it is considered to be part of the acid volcanics occurring at the base of the Buldiva Group. These volcanics are considered to have been deposited on a very irregular eroded surface of Brocks Creek rocks.

The costeaning and pit sinking which has been done and which has so far been concentrated chiefly along the western side of the anomaly indicated an increase in radioactivity with depth. In the pit (G. on Plate 2) and at the western end of Costeans Nos. 2, 3 and 4, the secondary uranium minerals autunite and torbernite occur in the kaolinized brecciated material. Assay results of samples taken from the south wall of the pit ranged from 0.022% e U_3O_8* to 0.88% e U_3O_8, while grab samples from "hot" areas in some of the costeans assayed 0.97%, 3.92% and 0.15% e U_3O_8.

Secondary uranium minerals also occur in the sections of the costeans that have been sunk in rocks - chloritic schists, etc. - which are tentatively regarded by the writer as belonging

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* All assays results in this report are from Geiger-assays and are given as equivalent U_3O_8, expressed e U_3O_8.

to the Brocks Creek group, but which further detailed work may show to be Upper Proterozoic in age. On the surface the occurrence of these minerals has been shown to extend in a southerly direction up the hill slope over a length of 200 feet.

Following the initial investigations arrangements were made for drilling two holes in the area. These diamond drill holes are now completed and a summary of results is given below. A detailed report on the drilling by R. B. Allen is at present in preparation.

D.D.H. No. 1.

Co-ordinates	240'S, 185'W
Bearing	230 degrees
Depression	35 degrees
Bore length	503 feet 4 inches

GEOLOGICAL LOG:

0' - 48' Chloritic schists belonging to Brock's Creek Group.

UNCONFORMITY

48' - 305' Angular conglomerate with fragments Brock's Creek sandstones and slates. Matrix is sandy and may be tuffaceous. Reddish Amygdaloidal acid volcanics between 278' and 288'. Pyrite present in section between 239' and 278'.

305'-436' Chloritic shales with serpentine and talc and sandstones. Red earthy hematite and some specular hematite veinlets in this zone. Core crumbly and regarded as transitional stage into overlying Buldiva sediments.

436'-503'4" Reddish brown sandstone showing fine bedding and pebbles in places. Obvious Buldiva sediments.

This hole passes from lower to upper beds in the Buldiva Group as the hole progresses. No precise break between the volcanics and the sandstones of the Buldiva Group has been recognised but the section between 305' and 436' is regarded as a transitional stage from one to the other.

Assay results from core samples taken from the hole are not yet available but the following assay results giving values of 0.01% e U308 or greater have been obtained from sludge samples.

75' - 80'	0.015% e U308	
85' - 90'	0.011% "	
90' - 95'	0.013% "	Autunite
100' - 105'	0.030% "	Zone.
245' - 250'	0.058% "	
250' - 255'	0.014% "	
255' - 260'	0.090% "	
260' - 265'	0.086% "	
265' - 270'	0.063% "	Pyrite Zone.
270' - 275'	0.017% "	
275' - 280'	0.021% "	
280' - 285'	0.014% "	
285' - 290'	0.058% "	
290' - 295'	0.014% "	

No primary uranium minerals were recognised in the pyritic zone. Mineragraphic investigation of the small quantities of sulphide minerals present in cores from a depth of 257'6" in No. 1 bore revealed the presence of pyrite, marcasite, chalcopyrite, bravoite, galena and possibley sphalerite

D.D.H. No. 2.

Co-ordinates 360'S, 90'W.
Bearing 224 degrees
Depression 35 degrees
Bore length 503 feet 3 inches.

GEOLOGICAL LOG.

0' - 163'	Chloritic schist with some fine siltstone. Brock's Creek rocks.
	UNCONFORMITY
163' - 247'	Tuffaceous sandstone
247' - 282'	Sandstones and shales - partly tuffaceous and frequent angular fragments.
282' - 453'	Similar to above but core crumbly with earthy hematite and specular hematite veinlets in shale. Transitional zone into Buldiva sandstone from 428' to 453'.
453' - 503'3"	Reddish brown Buldiva sandstone - locally finely bedded and contains some pebbles.

This hole passes from lower to upper beds in the Buldiva Group as the hole progresses. Again it is difficult to fix a precise break between volcanics and overlying sandstones in the Buldiva section. It is thought that the section in this hole from 163' to 453' represents stratigraphically the section from 48' to 436' in hole No. 1, even though it may not be very similar lithologically.

Sludge samples from the hole giving values of 0.01% e U308 or greater are as follows:-

65' - 70'	0.028% eU308	)
70' - 75'	0.012 "	)
95' - 100'	0.043 "	)
100' - 105'	0.036 "	) Autunite zone.
105' - 110'	0.07 "	)
110' - 115'	0.016 "	)
115' - 120'	0.01 "	)
130' - 135'	0.01 "	)
170' - 175'	0.022% "	)
175' - 180'	0.01 "	)
185' - 190'	0.011 "	) Values associated with
200' - 205'	0.019 "	) reddish earthy hematite
295' - 300'	0.01 "	)
495' - 500'	0.01 "	)

Complete results from core samples from the hole are not yet available, but the following results are to hand:-

64'6" - 68'6"	0.06% e U308
103'6" - 108'6"	0.127% "

CONCLUSIONS.

The drilling has tended to confirm the existence of a belt of acid volcanics of variable character at the base of what is at present known as the Buldiva Group. The acid volcanics have been deposited on an irregularly eroded surface of Brock's Creek rocks.

The drilling has not disclosed any important uranium ore bodies, but is as yet inconclusive. Some uranium mineral-

ization is undoubtedly associated with the acid volcanics and appears to be closely connected with areas where black slate fragments are abundant. Drilling so far undertaken has not tested the possibility of uranium mineralization occurring in the underlying Brock's Creek Group. It appears that testing of the black slate bed in the Brock's Creek Group, which has shed the fragments contained in the acid volcanics, should be under-taken.

Much further drilling is required to test the Coronation Hill area properly, and the following work is recommended:

(a) Vertical drilling to delineate properly the junction between the acid volcanics and the underlying rocks (tentatively referred herein to the Brock's Creek Group).

(b) Angle-hole drilling in the "Brocks Creek Group" below the acid volcanics, in order to test the whole of the section from the vertical cliff face northwards to the copper-bearing quartz-filled fault (See Plate 2).

The Coronation Hill discovery is important in that it draws attention to the occurrence of uranium in the acid volcanics at the base of the Buldiva Group, and indicates scope for widespread prospecting wherever these rocks crop out.

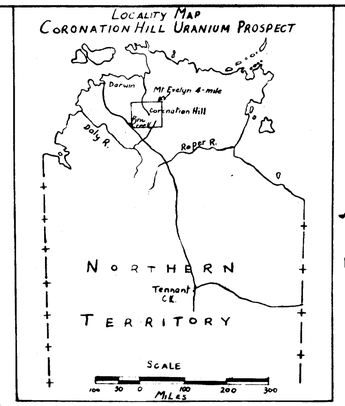
PLATE I

RECONNAISSANCE GEOLOGICAL MAP
CORONATION HILL - GOODPARLA AREA

SCALE

0 1 2 3 4 5 6 7 8 9 10 miles

LOCALITY MAP
CORONATION HILL URANIUM PROSPECT



REFERENCE

Lower Cretaceous	Klm	Mullaman Group
Upper Proterozoic	Pug	Mount Callaman Group
	Pue	Edith River Group
	Pug	Gerowie Group
Lower Proterozoic	Plb.	Brocks Creek Group

- Middle Creek Granite
- Diabase
- Basic Volcanics
- Intermediate Volcanics
- Rhyolite
- Porphyry sills and flows.
- Major Faults and fractures
- Mineral Lease
- Track
- Homestead.
- Airborne Scintillometer Anomaly.

Based on traverse information and photointerpretation
Geology by B.P. Walpole, B.J. Drew, D. White
and R. Britten

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PLATE 2.

SKETCH MAP
CORONATION HILL PROSPECT

N

SCALE
100 0 100 200 300 FEET

Reference

- Chloritic schist
- Quartz-filled fault or quartz vein
- Approximate outcrop boundary
- 240 Topographic contour
- Radiometric contour
- Lease peg - position approximate
- Proposed diamond drill hole
- "A" Radiometric anomaly
- A Mineralization reference point
- 2½x Radioactivity as multiple of background

M.L.3A

240' 260 280 300 320 340 360 380 400 420 440 460 480 500

Malachite, quartz and chalcocite stringers

Quartz veins

Pit 3' deep in rubble

Quartz blow

Scattered outcrops

No.1 D.D.H.

No.5 Costean

No.4 Costean

No.7 Costean

No.3 Costean

No.2 Costean

No.1 Costean

No.2 D.D.H.

Pit

Chloritic schists

Vertical cliff face

LINE BASE

"A" "B"

A' B' A B C D E F G H 1 2 3 4 5 6 7

12x 26x 3x 2½x 7x 13x

Plane table and telescopic alidade survey and geology by
B.P.WALPOLE, B.DREW & R.BRITTON
JUNE 1953

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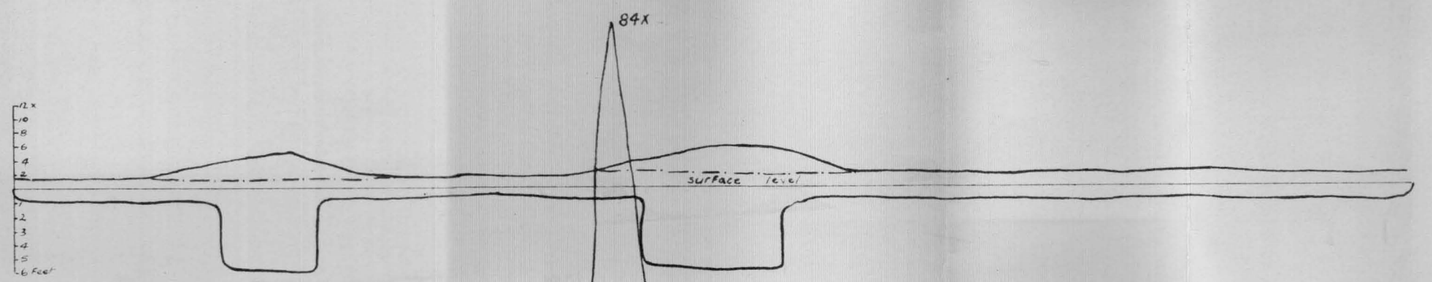
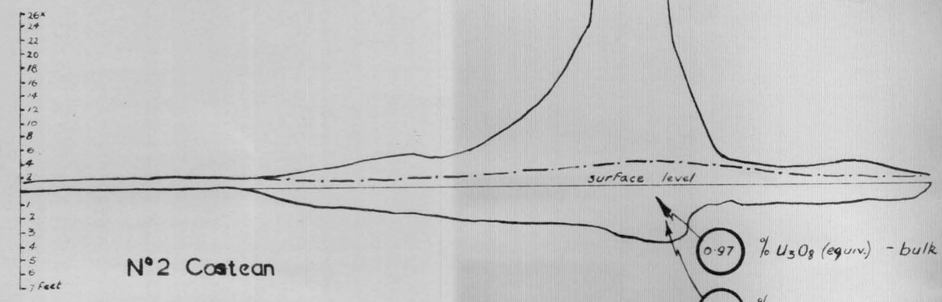
PLATE 3

CORONATION HILL PROSPECT

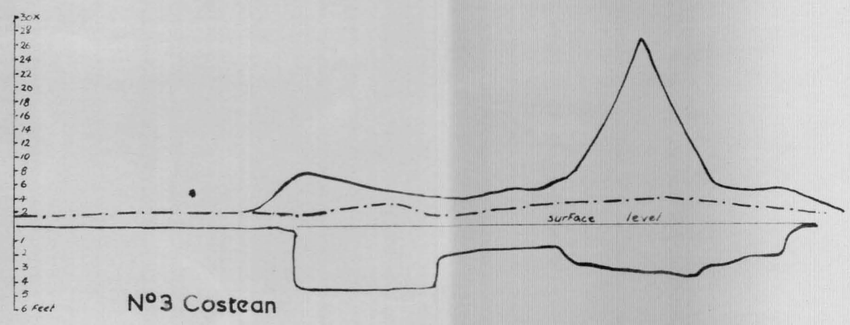
Radiometric Profiles of Costeans and Assay Values at 22.7.53



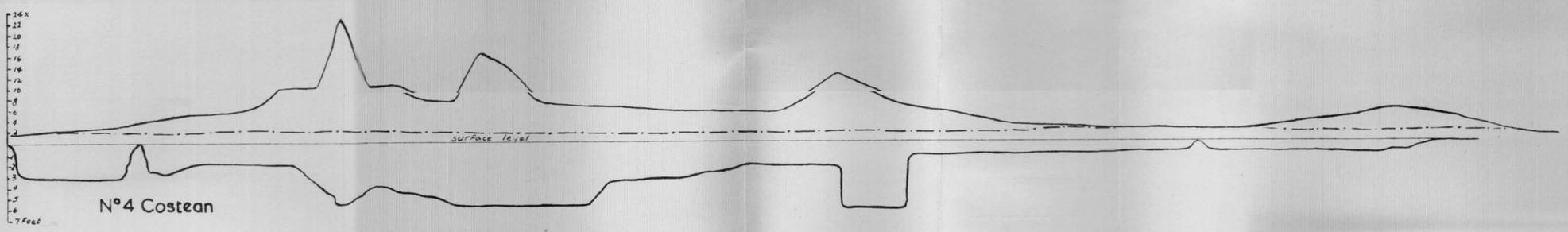
N°1 Costean



N°2 Costean

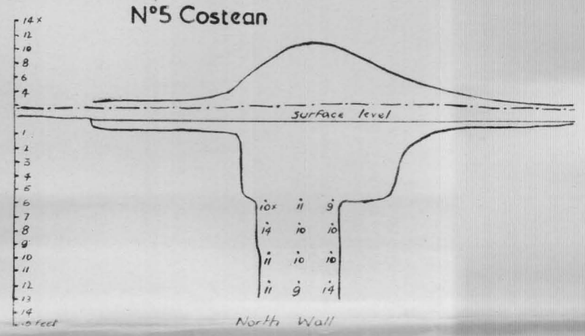


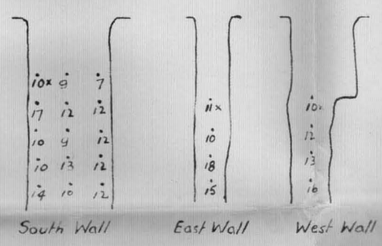
N°3 Costean

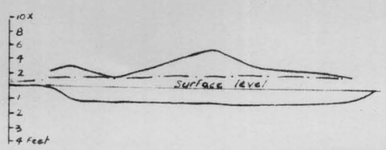


N°4 Costean

N°5 Costean

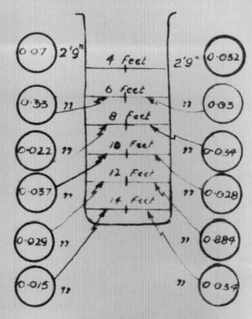






N°6 Costean

Assay Plan South Wall



% U_3O_8 (equiv.) - channel samples

Average Weighted Assay (calculated)
0·129 %

East — West

REFERENCE

- radiometric profile - readings taken on costean bottom
- surface radiometric profile
- 12X — radioactivity as multiple of background
- (0·33) — assay - preliminary radiometric value as % U_3O_8 equivalent

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Background taken as 6 microamps on C scale - reading on barren quartz blow using Portable Ratemeter Type 1011C. Radiometric Profiles by R. De Groot and R. Britten 22·7·53

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PLATE 4

CORONATION HILL PROSPECT

N°1 DIAMOND DRILL HOLE

Scale

40 35 30 25 20 15 10 5 0 40 80 120 160 Feet

Note: All assay figures shown are preliminary radiometric assays.

Values given as % e. U_3O_8.

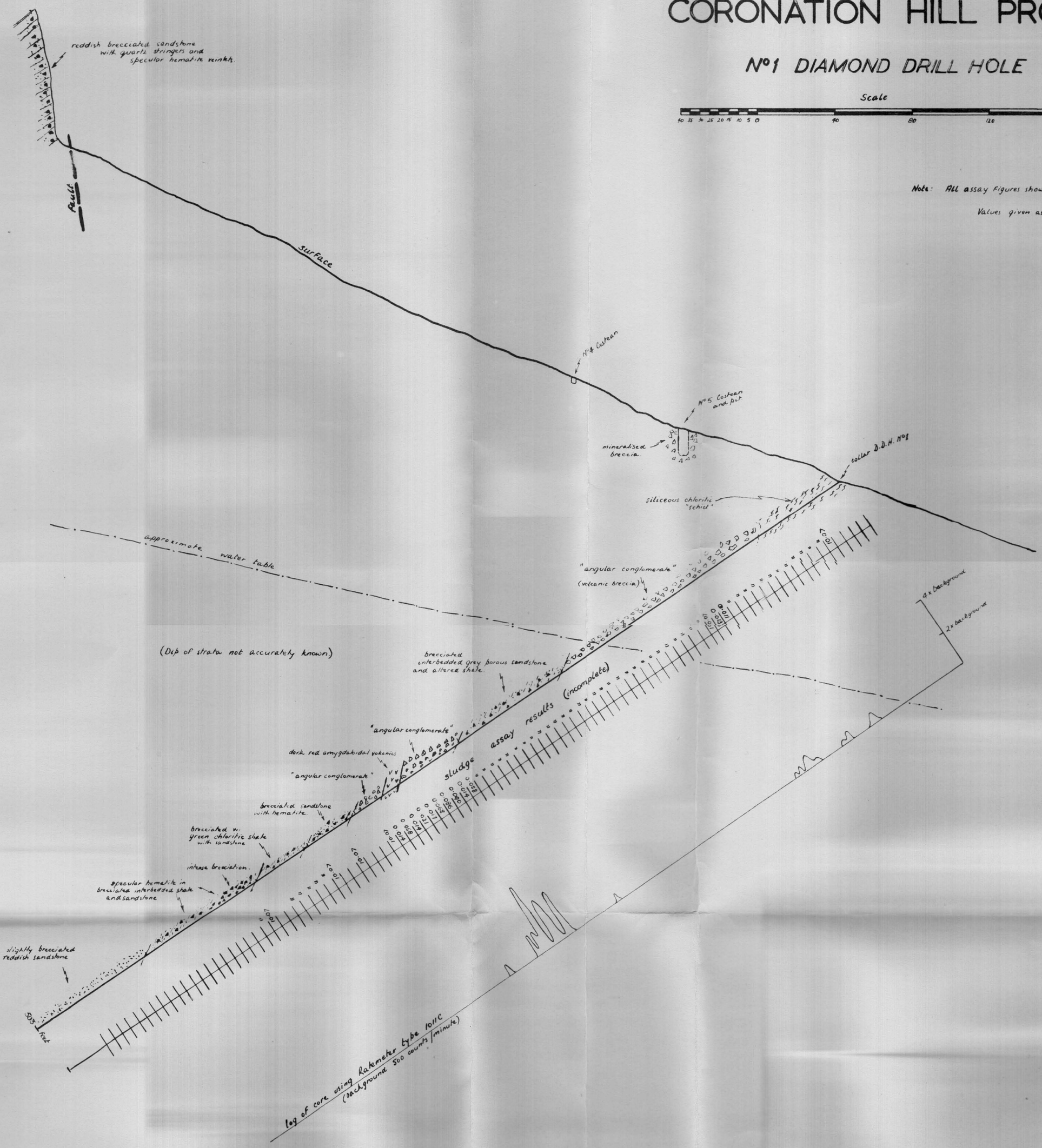

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PLATE 5

CORONATION HILL PROSPECT

N°2 DIAMOND DRILL HOLE

Scale

40 35 30 25 20 15 10 5 0 40 80 120 160 Feet

All assay figures shown are preliminary radiometric assays
Values as % e U3O8

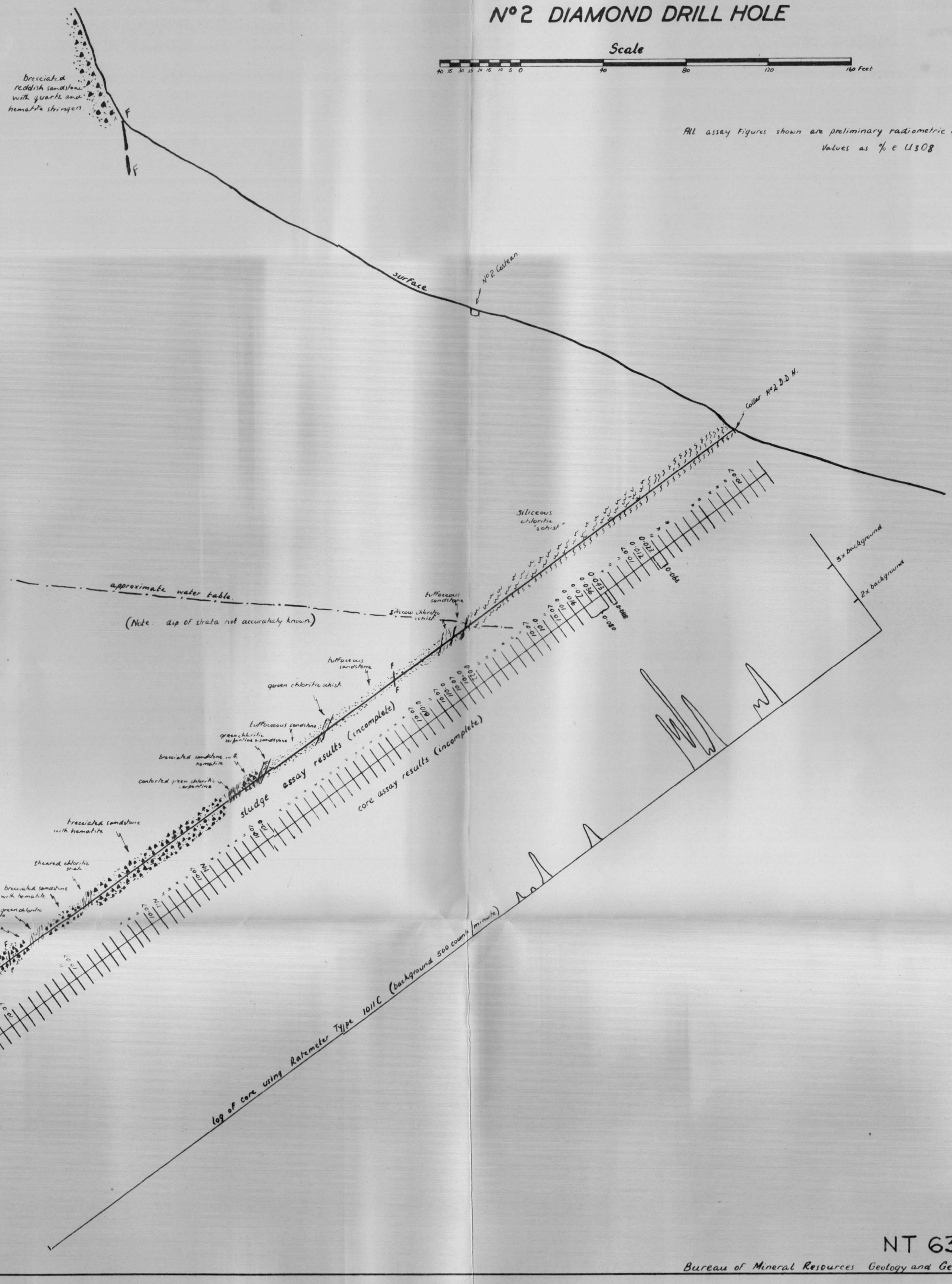

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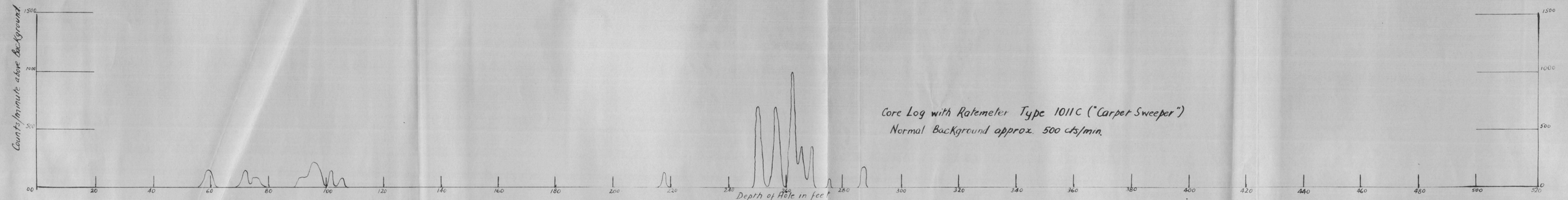
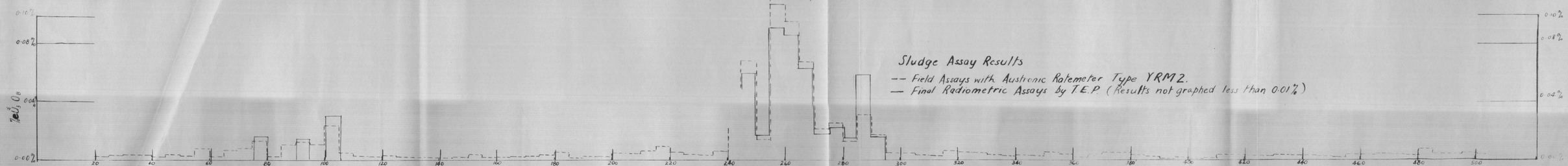
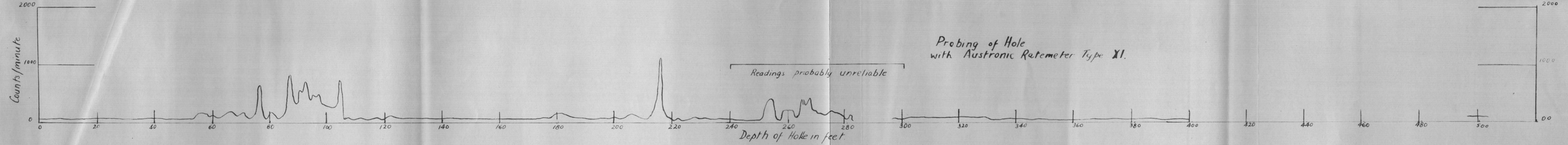
PLATE 6



Core Log with Ratemeter Type 1011C ("Carpet Sweeper")
Normal Background approx. 500 cts/min.



Sludge Assay Results
-- Field Assays with Austronic Ratemeter Type YRM2.
— Final Radiometric Assays by T.E.P. (Results not graphed less than 0·01%)



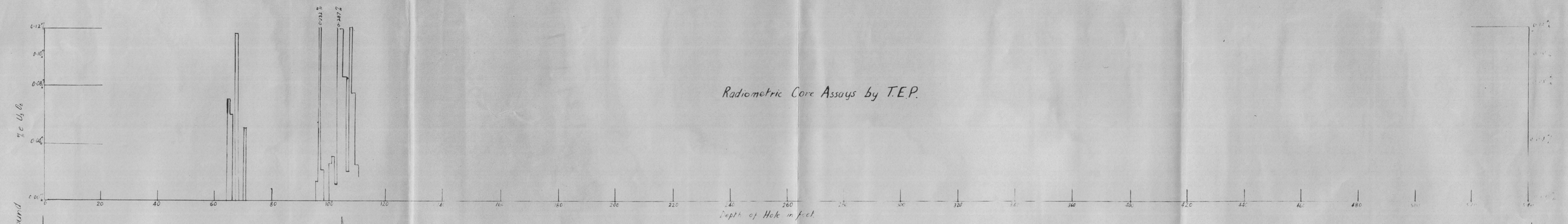
Probing of Hole
with Austronic Ratemeter Type X1.

Radiometric Work by A.J. Barlow.
1953.

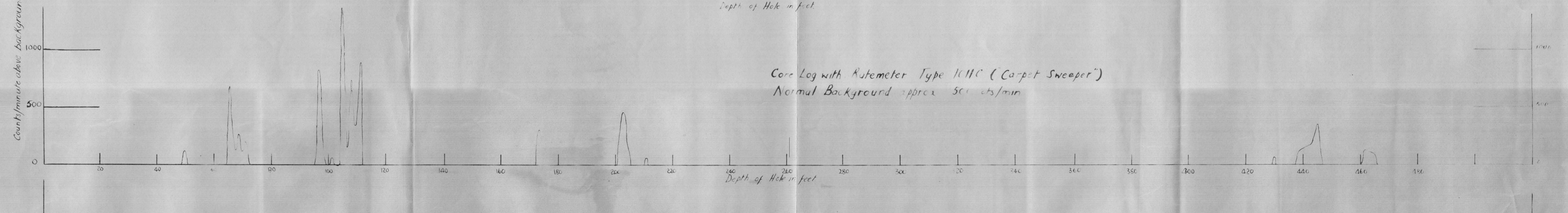
CORONATION HILL
N°·1 D.D. HOLE

PLATE 7

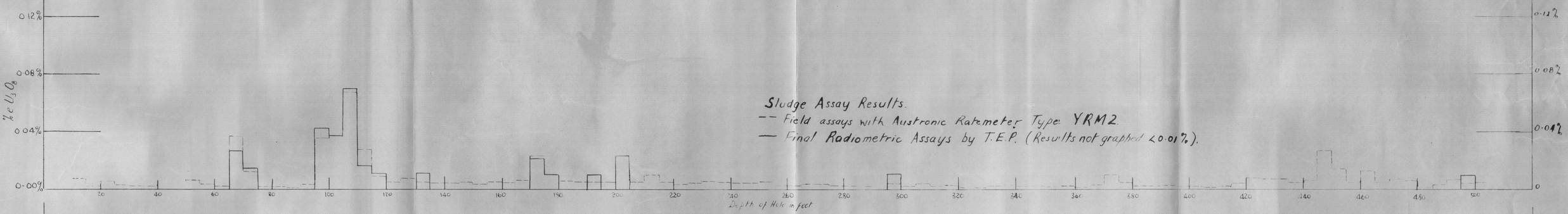
Radiometric Core Assays by T.E.P.



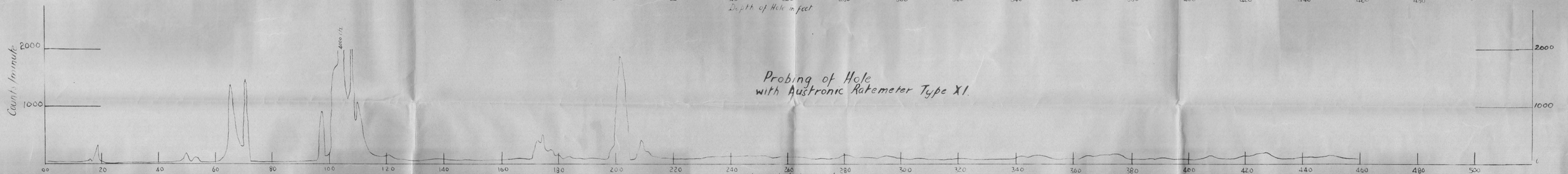
Core Log with Ratemeter Type 1011C ("Carpet Sweeper")
Normal Background approx 500 cts/min



Sludge Assay Results.
-- Field assays with Austronic Ratemeter Type: YRM2.
— Final Radiometric Assays by T.E.P. (Results not graphed <0.01%).



Probing of Hole
with Austronic Ratemeter Type X1.



Radiometric Work by A.J. Barlow
1953

CORONATION HILL
N° 2 D.D. HOLE