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COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Record No. 1969 / 141

Summary of B.M.R. Exploration Rum Jungle Area, 1969

by

C.E. Pritchard and J.E.F. Gardener

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SUMMARY

Two new projects were commenced in 1969. The Crater Investigation envisaged a complete reassessment of the Crater and Beestons Formations and their anomalous radioactivity in order to select favourable drilling sites to test for uranium mineralization below the depth of weathering. Geological and radiometric surveys have led to the selection of the most favourable area and drill sites will be nominated shortly.

The Alpha Investigation was designed to measure the uranium distribution in the Crater Formation but excessive thoron prevented this. The equipment is being modified. Tests in known uraniferous areas suggest that the alpha emitter radon, a gas, does not migrate far from its mother, a solid.

Auger drill radiometric and geochemical surveys confirmed anomalies at Huandot, Kerles No.4, Jeffreys No.3, and Area 55A but failed to confirm or showed that low order anomalies were not significant at other localities.

Rotary drilling of radiometric anomalies at Area 44 Extended and Kerles No.4 showed that these did not persist in depth. An anomaly at Jeffreys No.3 persists and is still under investigation. Rotary drilling immediately southeast of Rum Jungle Creek South open cut did not locate ore, though anomalous radioactivity is present.

Diamond drilling found ground conditions which were much worse than those encountered in recent years and three holes were abandoned before reaching target. Four holes on base metal anomalies and one on a radiometric anomaly did not intersect significant mineralization.

One hole to test a possible extension of Dysons Uranium orebody has just been completed at the time of writing (November 1969), and the results are being evaluated.

Mapping and sampling of three magnesite occurrences has indicated that two are probably of significant size and marketable grade.

Introduction

Following a policy decision to reduce the area under Reservation, field work at Rum Jungle in 1969 was restricted to an area of 100 square miles.

The Minister for the Interior invited interested parties to apply for prospecting and mining rights to the rest of the previously reserved area, and many company representatives called at the Darwin office for information and discussion on the areas to be released.

In addition to the types of exploration surveys carried out in recent years two new investigations (viz. measurements of Alpha activity in boreholes and the use of a 256-channel gamma spectrometer in the Darwin laboratory) were commenced in 1969. Geological staff (C.E. Prichard, D.J. French, and R.S. Needham) carried out auger drilling, geochemical and radiometric surveys, supervised diamond drilling and rotary drilling programmes and commenced the Crater Investigation.

The BMR Gemco drill completed about 21,000 feet of auger drilling and almost 1000 samples were collected for geochemical analysis. Drilling comprised an investigation of known radiometric and geochemical anomalies in the Huandot Area, follow up work at various localities in the Rum Jungle Triangle area, and about 4000 feet for the Alpha Investigation.

Nine diamond drill holes were completed, totalling about 5000 feet.

Geophysical staff (J.E. Gardener) carried out Alpha Investigations using equipment from the Australian Atomic Energy Commission, and provided geophysical support including logging of holes, maintenance of radiometric equipment, and operation of the gamma-ray spectrometer.

This report covers work completed up to mid-November, 1969. The location of survey areas is shown on Plate 1.

Crater Investigation (Plates 1, 2, 3, 4, 5, 6)

An investigation of the distribution, environment, and controls of radioactive occurrences in the Crater and Beestons Formations commenced in 1969.

A geological and radiometric reconnaissance of the formations around the Rum Jungle Complex and the northern part of the Waterhouse Granite was carried out first and results are presented in Plates 2 and 3. The outcrops along the southern margin of the Rum Jungle Complex showed the maximum development both of thickness of the formations and of anomalous radio-activity.

Following further examination of this area, which is locally known as the "Crater Line", the Shirley Area was selected as warranting closest examination. Plates 5 and 6 show the results of geological and radiometric mapping of this area.

Maximum radioactivity occurs in the No.1 Conglomerate. Locally the No.2 Conglomerate has some very high values but is generally not well developed. The Crater Pebble Beds - a sequence about 200 feet thick below the No.1 Conglomerate - are well developed in the Shirley Area and strongly radio-active. They do not outcrop as well as the Conglomerates and soil cover tends to reduce the radio-activity recorded at the surface, but auger drilling has shown it is generally quite high.

A rotary drilling programme is to commence shortly in this area in order to investigate the distribution of radio-activity to moderate depths (of the order of 150 feet) and to supplement available information on the detailed stratigraphy of the Crater Formation.

Sites for proposed diamond drill holes to test the No.1 Conglomerate and the Crater Pebble Beds at a vertical depth of at least 1,000 feet are now being selected and mapped in detail.

To supplement the Field surveys, it is also proposed to undertake a study of the heavy mineral content of the Crater Formation, with particular emphasis on its stratigraphic and areal variation. Initially, twenty samples of representative rock types are being prepared at A.M.D.L. and will be examined in the B.M.R. Laboratories, Canberra.

Two lines of auger holes were drilled in the Crater Formation (Plate 1) and alpha and gamma measurements made in the holes. The results showed that alpha and gamma anomalies coincided. Gas from various holes in the Crater Formation and over known pitchblende at R.J. Creek South was trapped in turn in the alpha probe and the activity of the daughter products was measured over some hours to establish their half lives. The results (Plate 4) show that the activity in the Crater Formation is due to daughter products of thoron. The particular half-life measured was 10.6 hours which is the half-life of Pb_{212}.

Area 44 Extended (Appendix: Logs and Sections DDH 68-6, 69-4A)

DDH 68-6 was completed at 819 feet on 236S to test Pb 3 anomaly. The hole was in Golden Dyke Formation throughout and did not intersect significant mineralization.

DDH 69-4A was drilled to 650 feet on the same anomaly at 256S. No significant mineralization was logged in the core but spectro-scan of scraped core returned values of 1000 ppm lead and 10,000 ppm zinc from 594 feet to 626 feet. This core has been re-examined, but the cause of the anomaly could not be recognized. It is being split for assay.

Seven rotary drill holes on radiometric anomalies have been drilled.

Six of these tested Anomaly R3. All had maximum radio-activity near the surface with values decreasing with depth. Only two (69-R3 at 284S 30W and 69-R5 at 264S 34W) were appreciably above background for short intervals below 100 feet.

The other hole completed the testing of Anomaly R2 and did not prove anomalous radio-activity at depth.

Mt. Fitch-Mt. Fitch North Area (Plate 7)

Several holes were investigated for alpha and gamma activity. The positions of holes and results of alpha counting are shown. In general, the alpha counts follow the gamma counts made in the holes and the alpha highs are on known radiometric anomalies.

Woodcutters L5 Area

Radiometric, resistance and self-potential logs were made of 24 diamond drill holes.

Huandot Area (Plates 8, 9)

Auger drilling as recommended by Willis (1969) to close up the grid to 200 feet by 100 feet spacing in the western part of the Huandot Area was carried out. In all 321 auger holes totalling 6828 feet were drilled.

In general Willis' anomalies were confirmed, contours were somewhat modified by the extra observations and higher peak base metal values were obtained.

The various anomalies extend over the major part of the area surveyed but their pattern does not seem to be related to known geological or structural trends. Probably they indicate a large weakly mineralized area rather than discrete bodies of ore grade.

One rotary hole (69-R1 at 302S 27W) was drilled to 200 feet on the peak of a lead anomaly. Analysis of cuttings over successive ten foot intervals showed that base metal content varied in depth but was lower than that in the original auger sample.

A line of holes was drilled across a known radiometric anomaly in the Golden Dyke Formation, and the down-hole gamma and alpha anomalies and the surface gamma anomaly coincided in position.

Follow-up Areas

Coomalie Creek

Three base metal anomalies located during the 1968 survey (Willis, 1969) were further examined by auger drilling.

(a) Lead-zinc anomaly at 460S 80W.
Nine auger holes were drilled. The anomaly was confirmed with lead values to 300 ppm and zinc to 690 ppm. It is clearly due to a remnant of a ferruginized weathering surface developed on the Coomalie Dolomite.

(b) Copper-zinc anomaly at 476S 68W.
Five auger holes were drilled. Maximum values obtained were copper 80 ppm and zinc 110 ppm. These are high background values and do not confirm the anomaly.

(c) Copper anomaly at 472S 4W.
Five auger holes were drilled and a maximum of 345 ppm copper obtained. This anomaly is located over amphibolite and values obtained are only slightly anomalous for amphibolite.

Kerles No.1 (Plate 10)

Five auger holes were drilled to check a locality where high radio-activity had been recorded previously. Radio-activity was low in all holes drilled and the maximum value recorded was only 10 cps in the top few feet.

Kerles No.2 (Plate 10)

A similar area was checked by nine auger holes and maximum radio-activity recorded was only 13 cps.

Kerles No.3 (Plate 11)

This area was checked for similar reasons and 12 auger holes were drilled. Maximum radio-activity was 17 cps at 5 feet to 8 feet.

Kerles No.4 (Plate 12)

Eighteen auger holes were drilled at this locality. Radio-activity was generally highest below ten feet depth. One hole at 278N 118E was above 20 cps throughout, with a peak value of 36 cps at 23 feet.

Rotary hole 69-R9 was drilled to 203 feet at this site and showed that anomalous radio-activity did not persist in depth.

Kerles No.5 (Plate 11)

Eleven auger holes were drilled and maximum radio-activity observed was 19 cps near the surface at the southern end.

Jeffreys No.1 (Plate 13)

This locality is on non-outcropping Crater Formation. Fifteen auger holes were drilled and although radio-activity is reasonably high with most holes reaching 20 cps, this is not unusual for the Crater Formation, and cannot be considered as warranting further follow up work.

Jeffreys No.2 (Plate 14)

Nineteen auger holes were drilled. Generally maximum values in the holes were obtained above ten feet depth. The highest value recorded, 22 cps, occurred at 12 feet and radio-activity in this hole had fallen to 2 cps at 20 feet.

Jeffreys No.3 (Plates 15, 16, 17)

In this area, radiometric and minor geochemical anomalies occur over Coomalie Dolomite adjacent to its boundary with the Crater Formation. Forty auger drill holes outlined a radiometric anomaly persisting in depth over a length of about 700 feet parallel to the geological boundary.

Five rotary drill holes showed that intensity of radio-activity fell off in depth but in two of these holes anomalous values still occurred below 50 feet depth.
Three more holes on 149S are being drilled.

Siding Area (Plate 18)

Eleven auger holes were drilled to check a shallow anomaly. Values fell off rapidly in depth. Maximum intensity occurred at 222N 222E where 16 cps were recorded at 2 feet to 4 feet below surface but only 6 cps at 12 feet depth.

Finniss South (Plate 19)

Twenty eight auger holes were drilled on a 1600 x 200 foot spacing to complete a reconnaissance investigation in the southwest part of the Triangle Area.

Radio-activity was low with only a few holes recording 20 cps and this at shallow depth. Maximum value occurred at 6S 68E where 38 cps were recorded at 5 feet and only 10 cps at 22 feet.

Geochemical samples were not anomalous. Except for two zinc analyses (110 ppm and 130 ppm) all values were less than 100 ppm.

Flynns Extended (Plate 20)

Twenty three auger holes were drilled in a belt of slate and schist which occurs within the Castlemaine Beds between Rum Jungle Creek Prospect and Flynns.

Higher radio-activity outlined is associated with a green chloritic schist. Counts are only moderately high and are quite variable in depth. There is no indication that they are associated with an ore deposit.

Area 55A (Plate 21)

To check and follow-up an indicated copper anomaly twenty eight auger holes were drilled. Maximum values obtained as shown on the accompanying plan are 1800 ppm copper, 2400 ppm lead and 2300 ppm zinc. The anomalous copper area is extensive but those for lead and zinc are small. The grid should be extended to the north and the west to close off the anomalies.

Rum Jungle Creek South (Plate 22)

The positions of the holes probed for both alpha and gamma activity, and the alpha counts are shown on Plate 22. An alpha anomaly occurs at the Rum Jungle Creek Prospect and another at the flood-out of the small creek shown. The gamma logs of the holes show that the radioactivity in the area of this flood-out is confined to the top fifteen feet, and that a gamma anomaly coincides with the alpha anomaly.

To check for possible extension of the Rum Jungle Creek South orebody, sixteen rotary holes at 200 foot centres were drilled immediately southeast of the opencut. It was planned to drill to 200 feet depth but the drill failed to reach this depth in most holes and the average depth drilled was 150 feet.

As would be expected adjacent to the orebody radio-activity was variable and commonly higher than normal. However, no radio-active material of ore grade was indicated by probing. The highest values were obtained close to the opencut, and radio-activity generally declined to the west and to the south. There is no indication of the orebody extending to the southeast.

Some of the more radio-active samples will be analysed in the gamma-ray spectrometer.

Embayment Area (Appendix: Log and Sections DDH 69-1 and DDH 69-2. See also: Record 1968/102, Plates 13, 15 and 16)

Diamond drilling of targets at Whites Extended and Dysons Extended was recommended following compilation of information in this area (Miezitis, 1969).

One hole at each target has been drilled by BMR but because of drilling difficulties in this area neither reached the target zone. A third hole to test the Dysons Extended target has just been completed.

DDH 69-1 (proposed drill hole "C" at 30205N, 33367E, Mine Grid) was to test a projected extension of uranium mineralization in Golden Dyke Formation slates below D103 in the Whites Extended area. Target depth was about 650 feet drill depth. As in other holes in this area, drilling difficulties were

encountered at about 400 feet and the hole was abandoned at 423 feet without testing the target.

DDH 69-2 (proposed drill hole "D" at 30320N, 33855E, Mine Grid) was sited to test for a possible down-plunge extension of the Dysons orebody. Target depth was 900 feet, but the hole had to be abandoned at 535 feet.

DDH 69-5 has been collared at 30067.4N, 34284.7E (Mine Grid) on a bearing of 300°T and a depression of 69° to test the same target. It has only just been completed at the time of writing (November 1969) and the results are still being evaluated. The main rock types encountered were:

0'-357' : Black slate and grey quartzite. (Acacia Gap Tongue)
357'-379' : Mudstone associated with H.Q.B. sequence.
379'-414' : H.Q.B., generally with mudstone matrix. Black slate band at 407'-409'.
414'-653' : Dolomite (Coomalie Dolomite)

Anomalous radioactivity occurs in several zones within the black slate sequence and in the H.Q.B. adjacent to the dolomite contact. Peak values were recorded in the interval 407'-410'.

Acacia Area (Appendix: Logs and Sections DDH 68-8, 68-9 + 69-3. See also: Record 1968/102, Plate 7.)

Three diamond drill holes were sited to test Anomaly L1 in the Acacia Area. This is a narrow lead anomaly about 3000 feet long, outlined by the 1968 geochemical survey (Semple, 1968).

DDH 68-8 at 24N, 1E was drilled to 594 feet, and DDH 68-9 at 16N, 1E, was drilled to 604 feet. DDH 69-3 was collared at 30N, 00E to test the central part of the anomaly, but was abandoned because of bad ground before reaching target.

No significant mineralization or lode structure could be recognized in the cores. Spectro-scan of scraped core showed maximum values of 1200 ppm zinc and 3-400 ppm lead from 330 feet to 430 feet in DDH 68-8 and 1000 ppm zinc and 1000 ppm lead from 517 feet to 542 feet in DDH 68-9. These values are comparable with auger sample values.

Mount Minza Area (Appendix: Log and Sections DDH 68-7)

One diamond drill hole was put down to a depth of 509 feet in the Mount Minza area to test a zone of geophysical and radiometric anomalies.

The results verified the calculated position of the conductor, but no significant mineralization was intersected.

Magnesite Occurrences (Plates 23, 24, 25)

Three areas have been mapped and sampled for magnesite. The location of the areas are shown on Plate 1. Two, Zeta and Huandot, are in Coomalie Dolomite, and the Celia Magnesite Locality is in the Celia Dolomite.

The Zeta area is four miles northwest of Batchelor and contains numerous low outcrops. Eighteen samples from this area contained between 19.4% and 44.3% MgO, but no areas of consistently high grade magnesite occurred, and the irregularity of distribution indicates that a product of reasonable grade could not be readily mined.

The Huandot Area is about 1½ miles northwest of the junction of the Batchelor road and the Stuart Highway. Twenty five samples were taken from a number of sub-areas of carbonate outcrop, of which two contained consistently high-grade magnesite. One, centered on 310S 50W, on the basis of 9 samples, averages 42.6% MgO; about 30,000 tons per vertical foot is indicated. Five samples from the second area, along 12W from 304S to 312S, averaged 42.5% MgO; 15,000 tons per vertical foot is indicated.

The Celia Magnesite Locality consists of a group of up-standing (to 40 feet high) outcrops of carbonate rock located about 4¾ miles northeast of Batchelor. Twenty one samples were analysed. Two contained 11.5% and 15.9% MgO respectively, but the other 19 all contained at least 37.7% MgO and averaged 42.8% MgO. The outcrops at this locality probably total about 70,000 tons above soil level.

Public Facilities

There has been a steady increase in the use of those Darwin Uranium Group facilities available to the public. Sales of Bureau maps continue to rise and have doubled in the last twelve months.

The installation and operation of the gamma-ray spectrometer has enabled radio-active samples to be investigated for uranium-thorium ratios and for equilibrium analysis. Several prospectors and companies as well as Mines Branch N.T.A. have used this service, and since the spectrometer was installed early in the year approximately 120 samples have been analysed.

Radiometric, resistance and self-potential logs were made of 24 diamond drill holes at the Woodcutters Prospect for the operating company.

Many company representatives called for discussion and advice, especially following the announcement by the Minister of Interior regarding release of areas near Rum Jungle.

Training

Mr M.A. Rahman of the Directorate of Nuclear Materials, Pakistan, spent two weeks with the Group in June.

He took part in all aspects of operations, especially auger drilling, probing and sampling. He studied methods and principles used to select areas for investigation and the interpretation and presentation of results, as well as the planning, organization and equipment required for these types of survey.

Mr J. Staim, a Colombo Plan student from Sabah, was with the Group in July and August. He was trained in all operations of a routine auger drilling, radiometric probing and sampling programme. As operations permitted he also spent brief periods familiarising himself with other types of field work in progress.

Regional Aspects

As a result of the current Crater Investigation and recent re-mapping of large areas from auger drill cuttings, a considerable amount of new geological information has become available on the Rum Jungle district, and a number of amendments are therefore required to the existing published maps of the area.

Many of these amendments are incorporated in Plate 2, including significant alterations to the Rum Jungle Complex boundaries, especially in the northern part, and the discovery of an unconformity between the Waterhouse Granite and the Batchelor Group about one mile southwest of Rum Jungle Creek South.

A draft map has been prepared, which it is intended to circulate for discussion among geologists working in the area, and which it is hoped may ultimately provide the basis for a revised edition of the published Rum Jungle District map.

Air-Borne Survey

A low-level gamma-ray spectrometer survey of part of the Rum Jungle area has just been commenced by the Bureau of Mineral Resources Aerocommander (November 1969). In addition to providing information on the uranium-thorium ratios in various anomalous areas, it is hoped that this survey will also assist with the elucidation of regional geological structure, particularly within the Rum Jungle Complex.

PROPOSED 1970 PROGRAMME

Geological

1. Auger Drilling Geochemical and Radiometric Surveys

   (a) Follow-up drilling in selected areas in Rum Jungle East and Triangle Area and including Area 55A.

   (b) Further radiometric surveys over poorly outcropping parts of the Crater Formation, especially the Crater Pebble Beds west of the Shirley Area.

(c) Geochemical and radiometric survey of the Stapleton Area initially at a spacing of 200 x 800 feet.

(d) Drilling holes for Alpha Investigation including areas remote from known mineralization. It is expected that drilling capacity will be available for targets of opportunity.

2. Rotary Drilling

Two BMR rotary percussion drills are expected to be available. These are larger and more powerful than the drill currently in use and greater depth is expected. They will be used for radiometric and stratigraphic investigation of the Crater Conglomerates and the Crater Pebble Beds, for follow-up work in the Stapleton Area, for investigation and identification of the cause of selected geophysical anomalies, and, if drilling capacity is available, to test magnesite occurrences at depth.

3. Diamond Drilling

Three holes of minimum length 1500 feet (but probably nearer 2000 feet) will be required to test radioactive horizons in the Crater Formation.

Up to six holes of average length 500 feet are also proposed to test radio-active and geochemical anomalies in the Rum Jungle East area and elsewhere including Jeffreys No.3 if current rotary drilling is favourable.

4. Further field investigation of the Crater Formation will be undertaken, together with Petrological and Mineralogical studies, with a view to elucidating environmental and structural factors pertinent to localisation of uranium mineralization. This will include detailed examination of the sub-surface material which is expected to become available from the proposed drilling programmes.

5. Investigation and evaluation of magnesite occurrences will be continued. Pilot samples will be collected for calcining tests and some of the known deposits may be drilled if drilling capacity is available.

6. Regional Aspects

If possible, a re-examination will be undertaken of those parts of the Rum Jungle District not already checked.

The area around the southern and western parts of the Waterhouse Granite in particular requires careful re-examination.

Geophysical

1. Follow-up rotary drilling of geophysical (particularly S.P.) anomalies as outlined by Gardener (1968). Resistivity and S.P. logging of holes and possibly some further surface measurements to try and elucidate interpretation of geophysical anomalies.

2. Some follow up of selected airborne radiometric anomalies by surface gridding, drilling, logging, etc. and testing of samples on the gamma spectrometer in Darwin. Programme to be decided after studying the results of 1969 airborne gamma-spectrometer work. The objective is to rigorously investigate the interpretation of airborne radiometric anomalies in this environment.

3. Continuation of alpha measuring programme with emphasis on refinement of the method and application to more reconnaissance type investigations.

4. Electric and radiometric logging of diamond drill holes as required. Investigation of other down-hole techniques (E.M. and I.P.) as staff available.

5. Surface geophysical surveys (E.M., I.P., S.P., etc.) as required. V.L.F. method to be used on selected areas.

6. Radiometric assaying using the 256-channel gamma spectrometer and other laboratory services provided by the Darwin laboratory.

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PLATE I

DARWIN

130°55′ 131°00′ 131°05′ 131°10′

12°55′

13°00′

13°05′

13°10′

RUM JUNGLE COMPLEX

WATERHOUSE GRANITE

MANTON DAM

NORTH

AUSTRALIAN

RAILWAY

FAULT

REEF

FINNISS

HIGHWAY

STUART

Creek

Coomalie

Mt Fitch North

Mt Fitch

White's

KERLE'S

3 4 5 2

RIVER

SIDING AREA

AREA 55A

BASELINE AREA

JEFFERYS 2 1 3

GIANT'S

ZETA

FLYNN'S AREA

Rum Jungle Creek

Rum Jungle Creek South

Crater Traverse 1.

Crater Traverse 2

SHIRLEY AREA

COOMALIE CREEK AREA

HUANDOT AREA

HUANDOT MAGNESITE

MT. CLARK

CELIA MAGNESITE PROSPECT

BATCHELOR

Meneling H.S.

FINNIS SOUTH AREA

Eva Valley H.S.

ADELAIDE RIVER

Alpha Surveys I

Crater Formation outlined by heavy boundary.

FIELD SURVEYS
1969

RUM JUNGLE DISTRICT N.T.

FIELD OPERATIONS

SCALE: 1 MILE TO 1 INCH

1 0.5 0 1 2 MILES

PLATE 2

CRATER INVESTIGATION
GEOLOGY
RUM JUNGLE DISTRICT N.T.
FIELD OPERATIONS

SCALE: 1 MILE TO 1 INCH

1 0.5 0 1 2 MILES

BY D.J. FRENCH

RUM JUNGLE COMPLEX

WATERHOUSE GRANITE

DARWIN

ADELAIDE RIVER

130°55′ 131°00′ 131°05′ 131°10′

12°55′ 13°00′ 13°05′ 13°10′

NORTH AUSTRALIAN RAILWAY

STUART HIGHWAY

FINNISS RIVER

REEF

FAULT

GIANT'S

MANTON DAM

Overturned Beds

Granite

Sheared Contact

Granite/met Sedimentary Contact

Unconformity

Basal Conglomerate

Basal Cgl.

V.Q

Unconformity Basal Cgl.

Tourmaline Quartz Replacement

Mt Fitch North

Mt Fitch

White's

Rum Jungle Creek

Rum Jungle Creek South

Meneling H.S.

Eva Valley H.S.

BATCHELOR

Coomalie Creek

REFERENCE

- QUARTZ VEIN
- OUTCROPS
- FAULTS
- GRANITE MARGIN
- BANDED IRON FORMATION
- FELSPAR MICA SCHIST
- BEESTONS FORMATION
- ~~CELIA FORMATION~~
- HEMATITE QUARTZ BRECCIA
- CRATER FORMATION
- HEMATITE BOULDER CONGLOMERATE
- CONGLOMERATE
- MINE OR PROSPECT
- ROADS
- TRACKS
- SYNCLINE
- ANTICLINE
- T_{50} DIP AND STRIKE

D52/87-517

PLATE 3.

RUM JUNGLE COMPLEX

WATERHOUSE GRANITE

DARWIN

130°55'

131°00'

131°05'

131°10'

12°55'

13°00'

13°05'

13°10'

NORTH AUSTRALIAN RAILWAY

FAULT

REEF

HIGHWAY

FINNISS RIVER

GIANT'S Creek

STUART Creek

Overturned Beds

Granite

Sheared Contact

Granite/met Sedimentary Contact

Unconformity

Basal Conglomerate

Basal Cgl

Mt Fitch

Mt Fitch North

White's

Rum Jungle Creek

Rum Jungle Creek South

Meneling H.S.

Eva Valley H.S.

BATCHELOR

MANTON DAM

Replacement Tourmaline Quartz

RADIOACTIVITY

> 0·2	mR/Hr
0·05 – 0·2	mR/Hr
0·01 – 0·05	mR/Hr

REFERENCE

- QUARTZ VEIN
- OUTCROPS
- FAULTS
- GRANITE MARGIN
- BANDED IRON FORMATION
- FELSPAR MICA SCHIST
- BEESTONS FORMATION
- CELIA FORMATION
- HEMATITE QUARTZ BRECCIA
- CRATER FORMATION
- HEMATITE BOULDER CONGLOMERATE
- CONGLOMERATE
- MINE OR PROSPECT
- ROADS
- TRACKS
- SYNCLINE
- ANTICLINE
- T_{50} DIP AND STRIKE

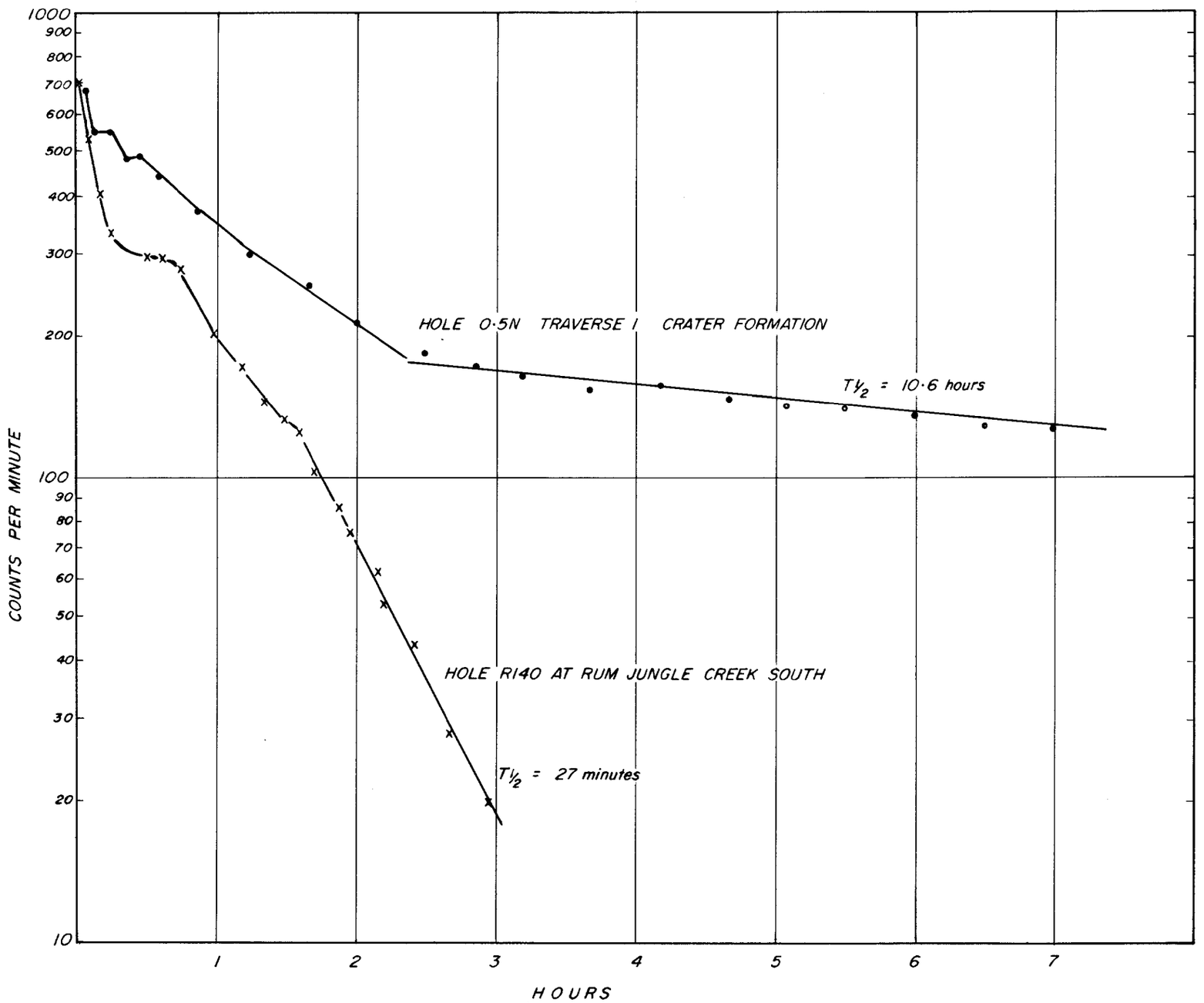
CRATER INVESTIGATION
RADIOMETRICS
RUM JUNGLE DISTRICT N.T.
FIELD OPERATIONS

SCALE: 1 MILE TO 1 INCH

1 0.5 0 1 2 MILES

BY D.J. FRENCH

B.M.R. DARWIN N.T. OCT. 1969 P.H.F.



ALPHA SURVEY, RUM JUNGLE AREA, NT 1969

HALF-LIVES MEASURED IN BORE-HOLES

D52/B7-508

PLATE 5

18 000 N — 52 000 E — 54 000 E — 56 000 E — 58 000 E — 60 000 E — 18 000N

16 000 N — 16 000N

14 000 N — 14 000N

12000 N — 12000N

10000N — 52000 E — 54 000 E — 56 000 E — 58000 E

REFERENCE

- TRACK
- DRAINAGE
- CONGLOMERATE
- HEMATITE BOULDER CONGLOMERATE
- Q.V. QUARTZ VEINS
- SYNCLINE
- ANTICLINE
- T_{10} DIPS AND STRIKE
- SHAFT
- FAULT
- QUARTZITE OUTCROP LINES
- Q QUARTZ
- T TOURMALINE
- Fe HEMATITE
- Py PYRITE

MAJOR GRID — T. E.P. MINE GRID

LOCAL GRID — CRATER LINE GRID

BASELINE 44° 52'

TO 'H'

TO DARWIN

CRATER PEBBLE BEDS

No. 1 CONGL.

No. 2 CONGL.

TO 'F'

79° 00'

TO BATCHELOR

BATCHELOR ROAD

SHALE

Q.T. Fe. Py

GEOLOGY

RUM JUNGLE DISTRICT N.T.

SHIRLEY AREA

CRATER INVESTIGATION 1969

GRID SURVEYED TIMBS & BRITTEN 1969

SCALE : 400 FEET TO 1 INCH

0 100 200 300 400 500 1000 FT.

BY D.J. FRENCH

B.M.R. DARWIN N.T. OCT. 1969 R.H.F.

D57/17-520

PLATE 6

18 000 N — 52 000 E — 54 000 E — 56 000 E — 58 000 E — 60 000 E — 18 000 N

16 000 N — 16 000 N

14 000 N — 14 000 N

12000 N — 12000 N

10000 N

52000 E — 54 000 E — 56 000 E — 58000 E

REFERENCE

- TRACK
- DRAINAGE
- ERRATIC HIGH VALUES
- RADIOMETRIC CONTOURS (in mR/Hr)

HARWELL 1368 A RATEMETER

MAJOR GRID — T.E.P. MINE GRID

LOCAL GRID — CRATER LINE GRID

BASELINE 44° 52" TO "H"

TO "F" 73° 00"

TO DARWIN

TO BATCHELOR

BATCHELOR ROAD

RADIOMETRIC CONTOURS

RUM JUNGLE DISTRICT N.T.

SHIRLEY AREA

CRATER INVESTIGATION 1969

GRID SURVEYED TIMBS & BRITTEN 1969

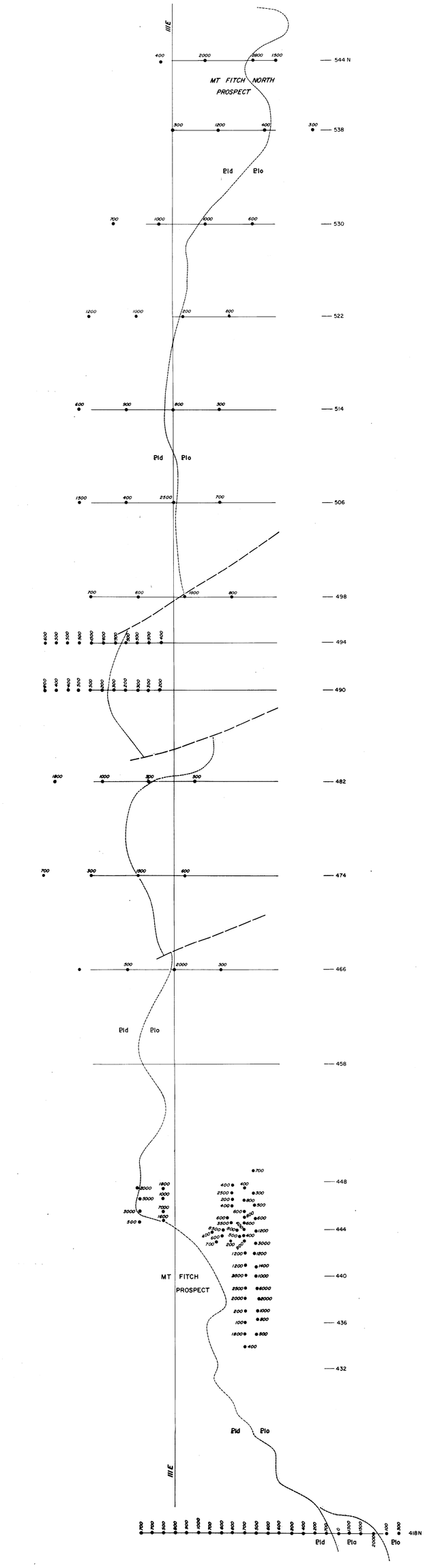
SCALE : 400 FEET TO 1 INCH

0 100 200 300 400 800 1000 Ft.

BY D.J. FRENCH

B.M.R. DARWIN N.T. OCT. 1969 P.H.F.

1-2187-517



Fault

Formation boundary

Pto — Coomalie dolomite

Ptd — Golden Dyke formation

Pta — Accacia Gap tongue

• 1000 — Auger hole and alpha counts per minute in the hole

Geology after Miezitis (1967)

SCALE

400 0 400 800 1200 FEET

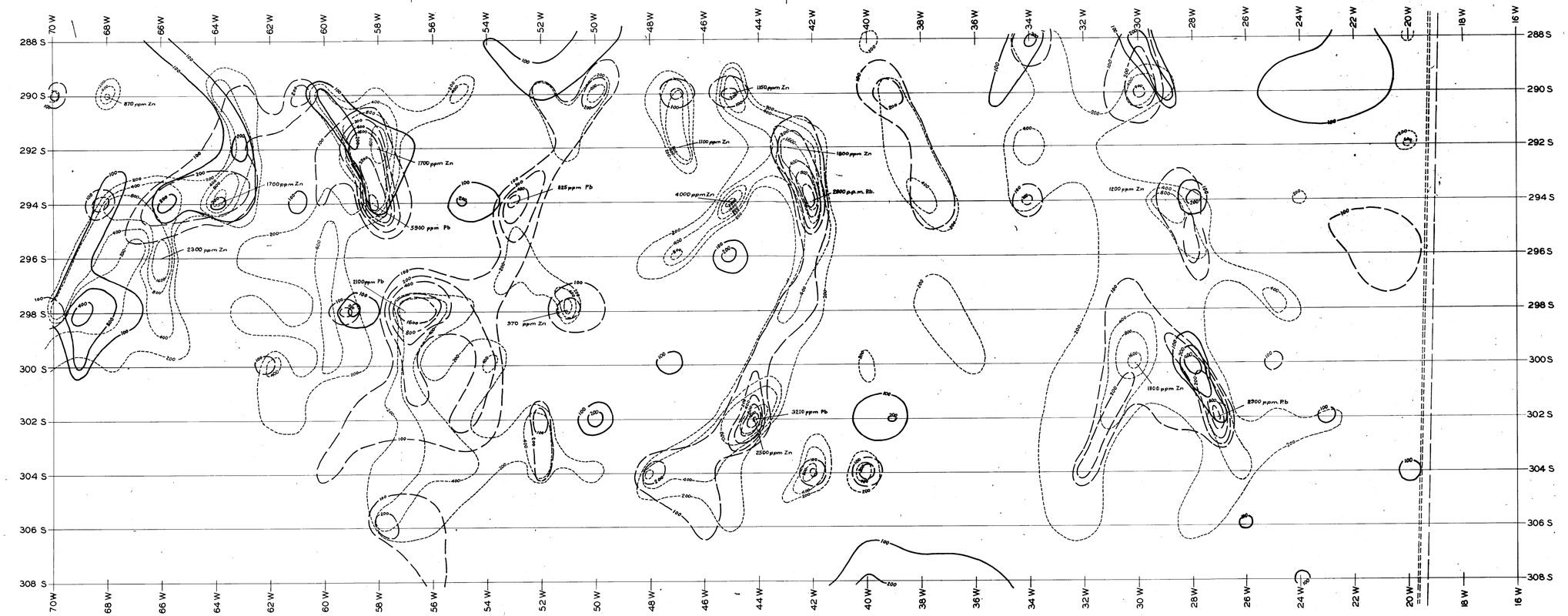
MT FITCH, MT FITCH NORTH AREA

ALPHA SURVEY, 1969

PLATE 7

D52/87-510

PLATE 8



REFERENCE

COPPER CONTOURS
100, 200, 400 p.p.m.

LEAD CONTOURS
100, 200, 400, 800, 1600, 3200 p.p.m.

ZINC CONTOURS
200, 400, 800, 1600, 3200 p.p.m.

BASED ON A.A.S. ANALYSIS OF AUGER HOLE SAMPLES.
J.L. WILLIS 1968 (REC. 1969/36)
R.S. NEEDHAM 1969

GEOCHEMICAL CONTOURS COPPER LEAD & ZINC

GEOCHEMICAL SURVEY 1969
HUANDOT AREA
RUM JUNGLE DISTRICT

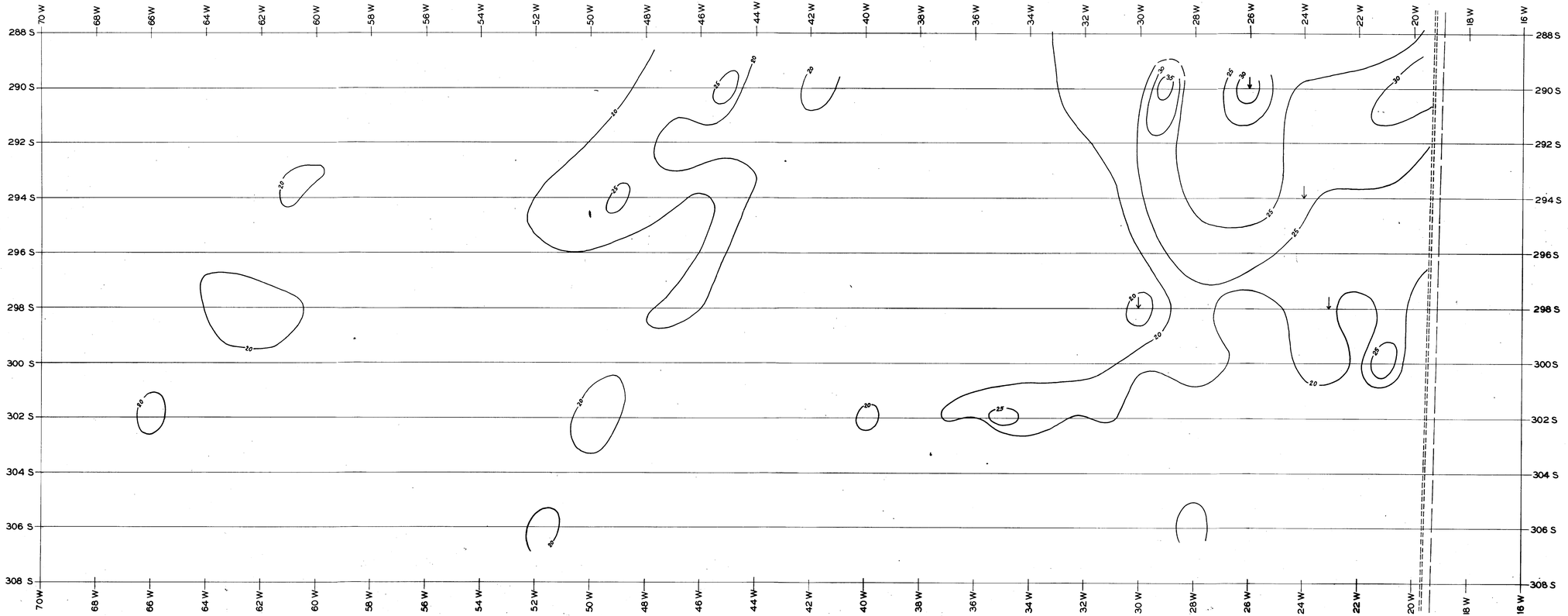
FEET 100 50 0 100 200 300 400
SCALE: 200 FEET TO 1 INCH

B.M.R. DARWIN N.T. OCT. 1969 R.H.F.

D.O./67-328

G

PLATE 9



REFERENCE

—20— RADIOMETRIC CONTOURS
20 cps. (0.031 mR/Hr)
25 cps. (0.039 mR/Hr)
30 cps. (0.047 mR/Hr)
35 cps. (0.055 mR/Hr)

↓ VALUE INCREASING IN DEPTH

BASED ON MAXIMUM VALUE IN HOLE
RATEMETER EMI TYPE 239

RADIOMETRIC CONTOURS

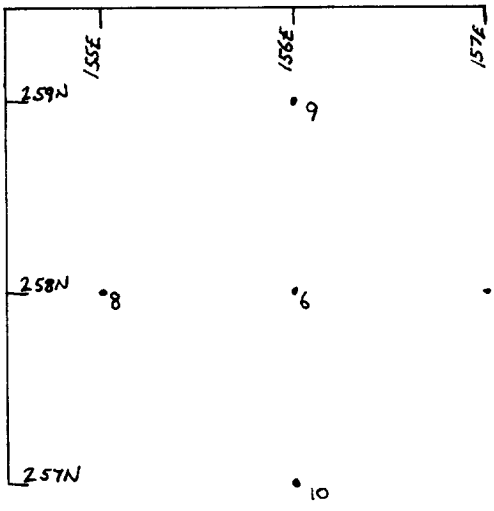
GEOCHEMICAL SURVEY 1969
HUANDOT AREA
RUM JUNGLE DISTRICT

FEET
100 50 0 100 200 300 400

SCALE: 200 FEET TO 1 INCH

D53/87-515

PLATE 10

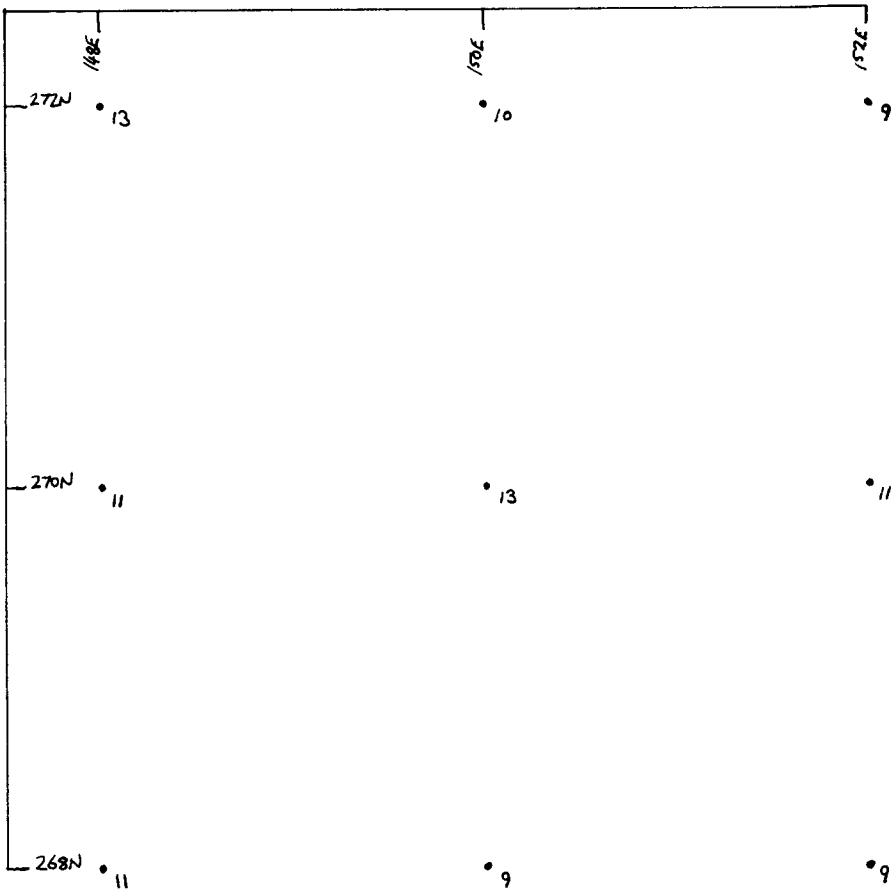


KERLE'S AREA 1.

RADIOMETRIC SURVEY
1969.
S. NEEDHAM.

• Auger Hole.
Values in c.p.s.

Scale 1" = 100'.
RUM JUNGLE AGRID.



KERLES AREA 2

RADIOMETRIC SURVEY

1969

S. Needham

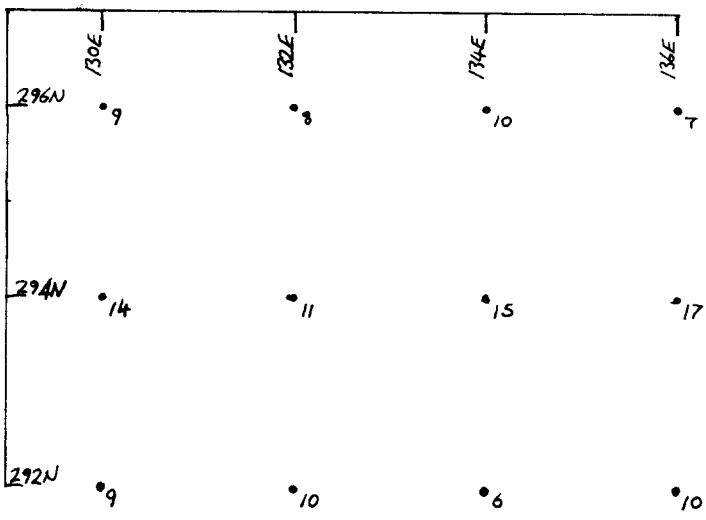
Auger Hole

Values in C.P.S.

scale 1" = 100'

RUM JUNGLE & GRID

PLATE II



KERLES AREA 3.

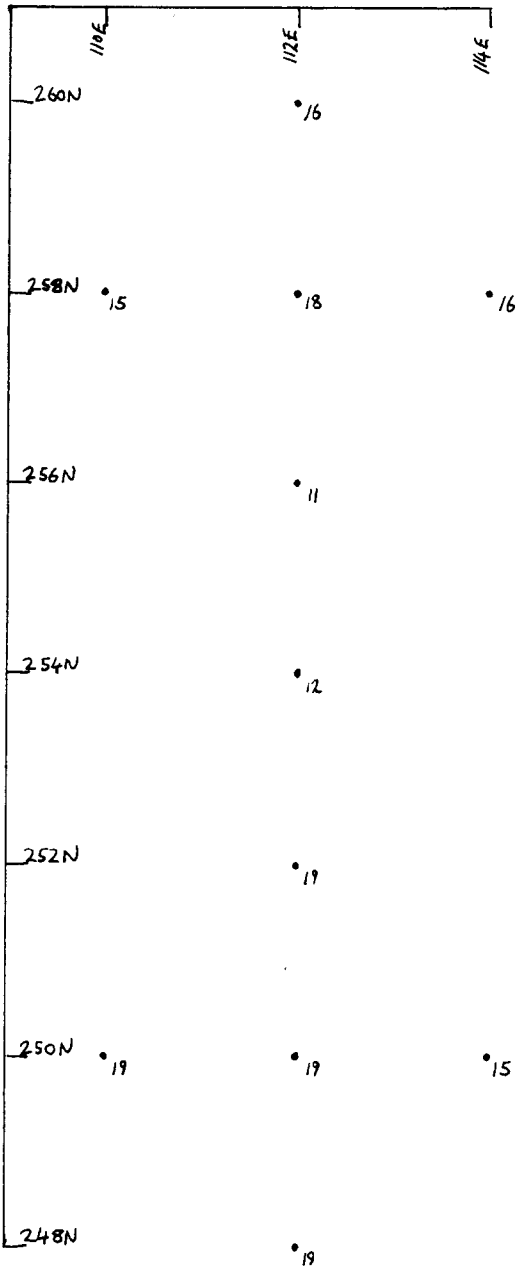
RADIOMETRIC SURVEY
A69.

S. NEEDHAM.

• Auger Hole.
Values in c.p.s.

Scale 1" : 200'.

RUM JUNGLE A GRID.



KERLES AREA 5.

RADIOMETRIC SURVEY
1969

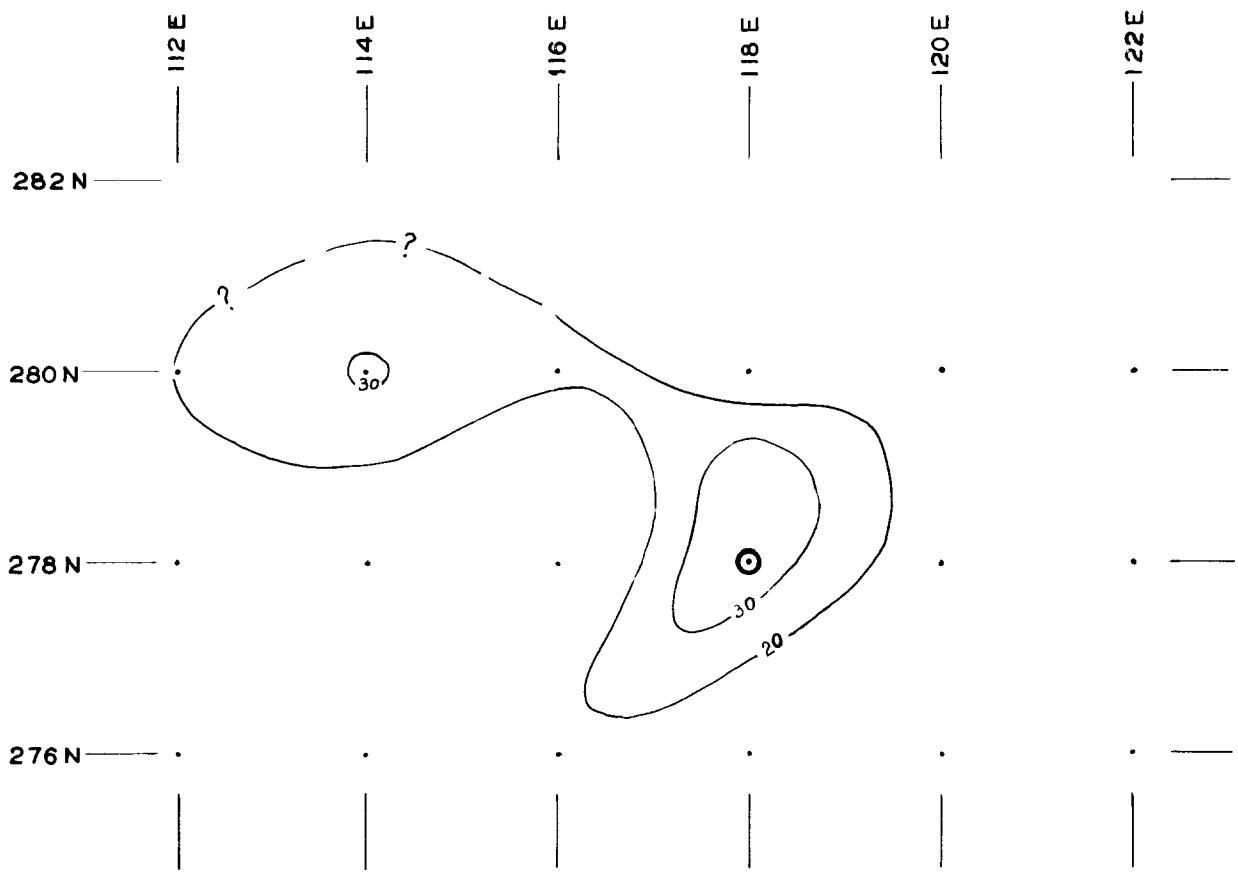
S. NEEDHAM.

• Auger Hole
Values in c.p.s.

Scale 1" : 200'.

RUM JUNGLE E GRID.

PLATE 12



REFERENCE

- O *ROTARY HOLE*
- • *AUGER HOLE*
- —20— *RADIOMETRIC CONTOURS*
  - 20 cps (0·031 mR/Hr)
  - 30 cps (0·047 mR/Hr)

RUM JUNGLE DISTRICT N.T.

KERLES No. 4

T.E.P. MINE GRID
1969 SURVEY

RADIOMETRIC CONTOURS

RESULTS GIVEN AS cps
RATEMETER No 416

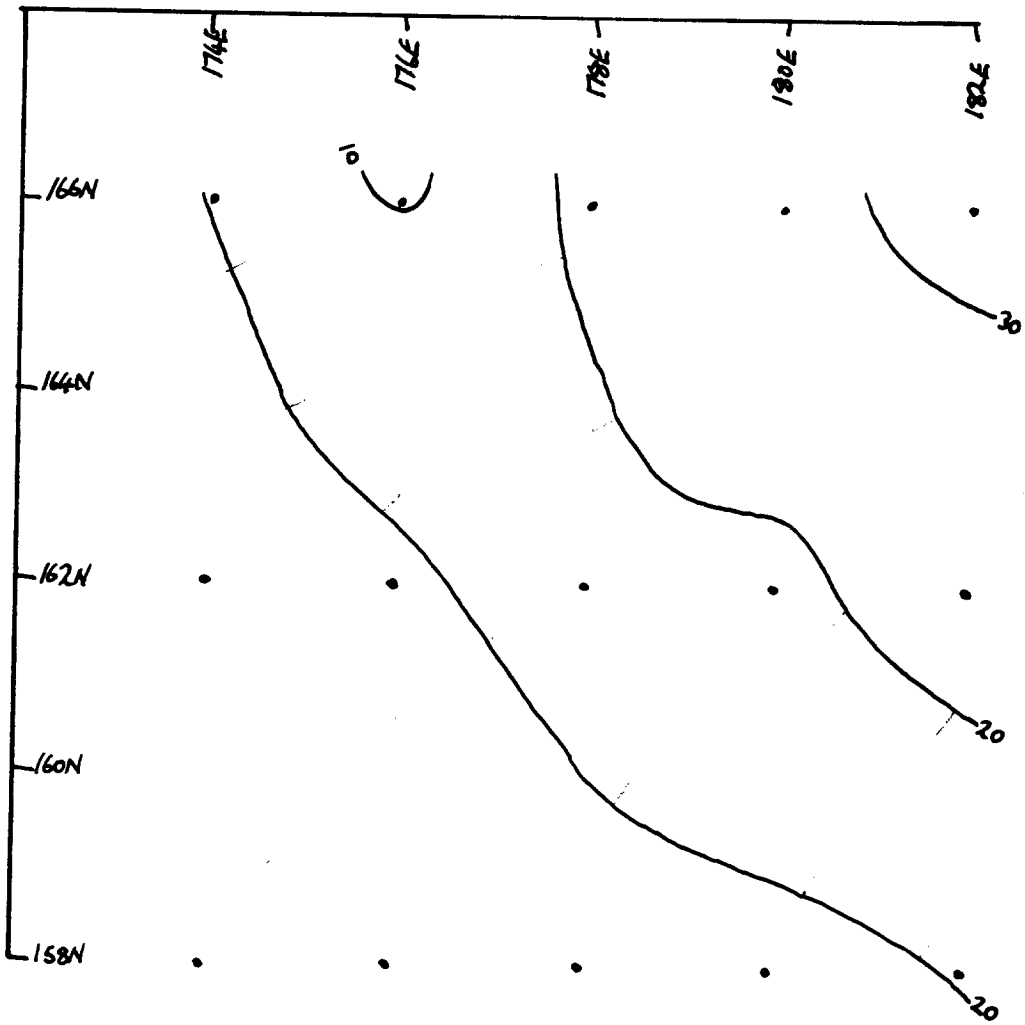
BY R.S NEEDHAM

SCALE: 200 FEET TO 1 INCH

B.M.R. DARWIN OCT. 69

D52/87-529A

PLATE 13



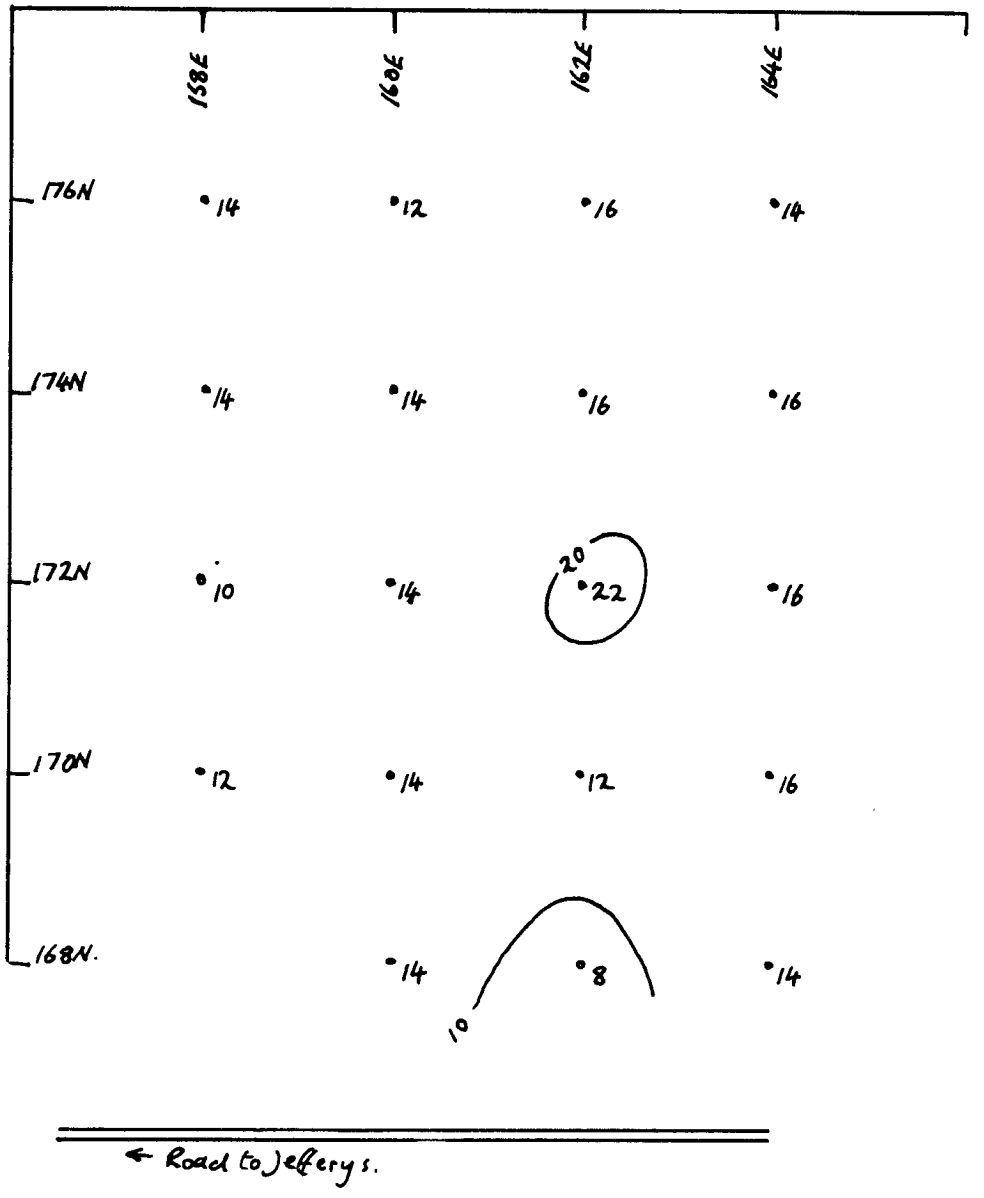
Scale 1" : 200'.
RUM JUNGLE AGRID.

JEFFERY'S AREA 1.

RADIOMETRIC SURVEY
1969.
S. NEEDHAM.

RESULTS IN c.p.s.
• Auger Hole.

PLATE 14



JEFFERY'S AREA 2

RADIOMETRIC SURVEY

1969

S. Needham

Results in c.p.s.

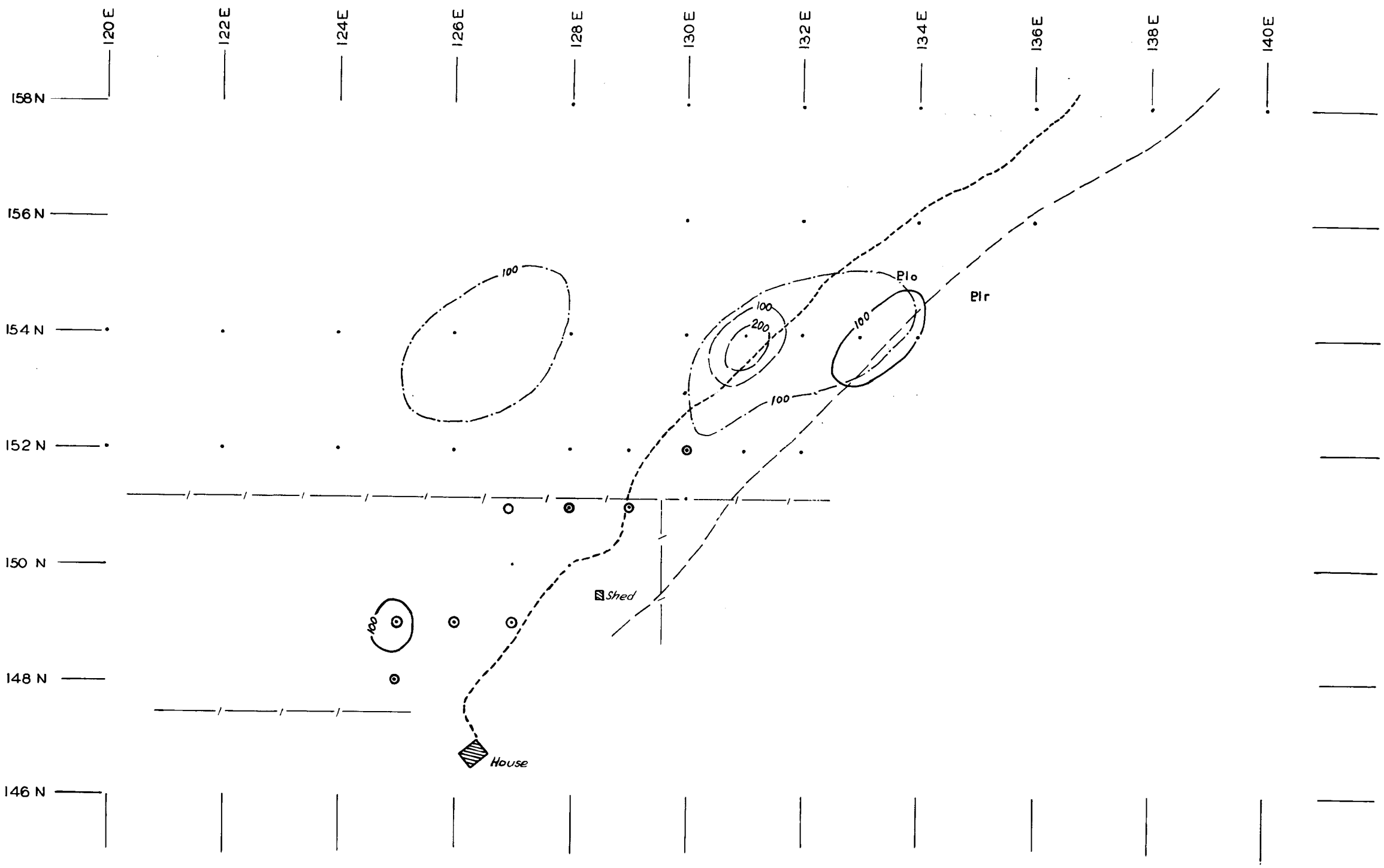
AUGER HOLE

(maximum values in hole are plotted)

Scale 1" : 200'

RUM JUNGLE Δ GRID

PLATE 15



REFERENCE

- O ROTARY HOLE
- · AUGER HOLE
- BOUNDARY
- FENCE
- TRACK
- COPPER 100 ppm
- LEAD 100, 200 ppm
- ZINC 100 ppm

BY R.S. NEEDHAM

GEOCHEMICAL CONTOURS COPPER LEAD & ZINC

RUM JUNGLE DISTRICT N.T.

JEFFERYS No. 3

T.E.P. MINE GRID
1969 SURVEY

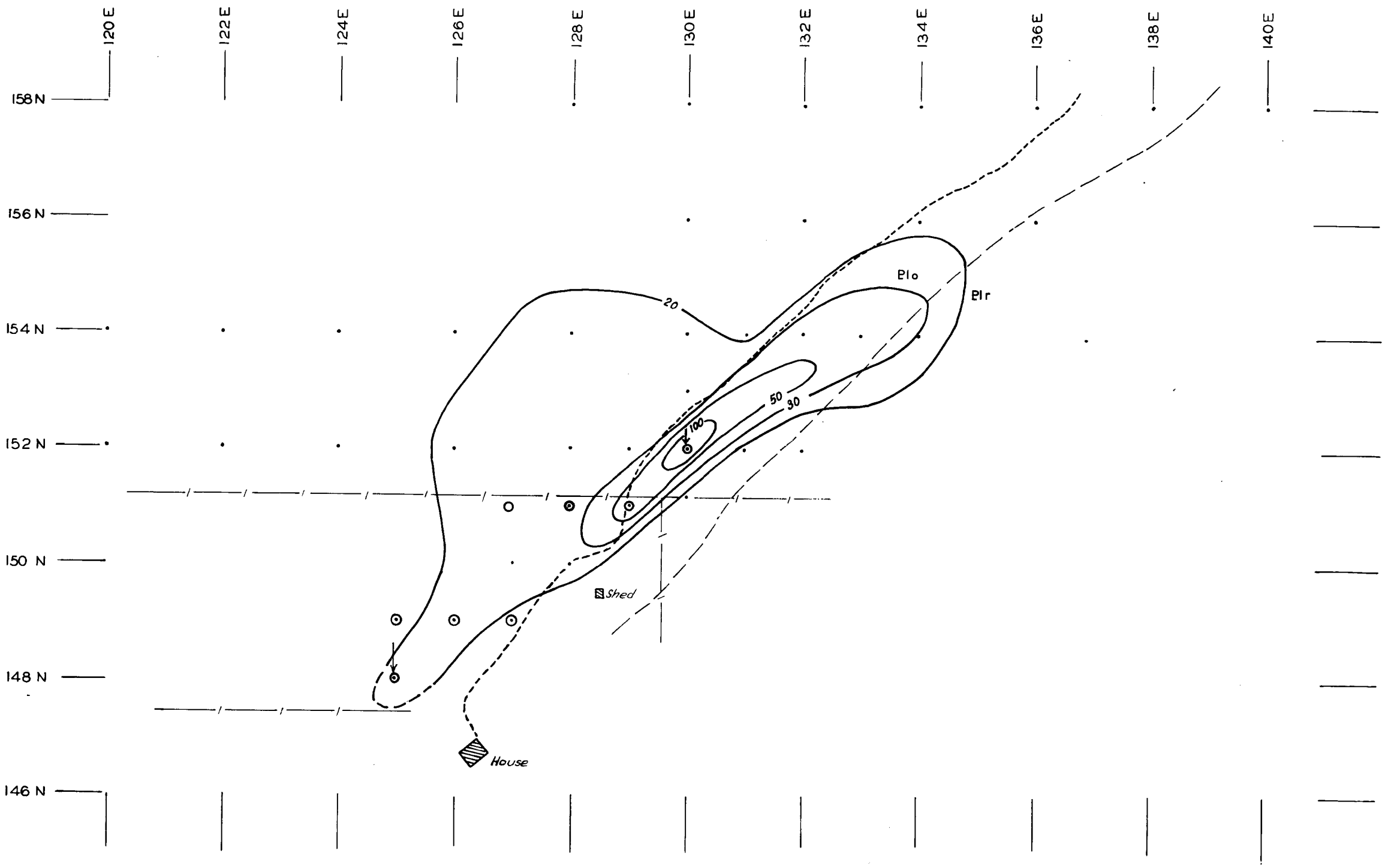
SCALE: 200 FEET TO 1 INCH

100 0 100 200 Ft.

B.M.R. DARWIN N.T. OCT. 1969 P.H.F.

1507 E7 521

PLATE 16



REFERENCE

- ROTARY HOLE
- AUGER HOLE
- BOUNDARY
- FENCE
- TRACK
- RADIOMETRIC CONTOURS

↓ VALUES INCREASING IN DEPTH

BASED ON MAXIMUM VALUE IN AUGER HOLE
RATEMETER EMI TYPE 239
BY R.S. NEEDHAM

RADIOMETRIC CONTOURS

RUM JUNGLE DISTRICT N.T.

JEFFERYS No. 3

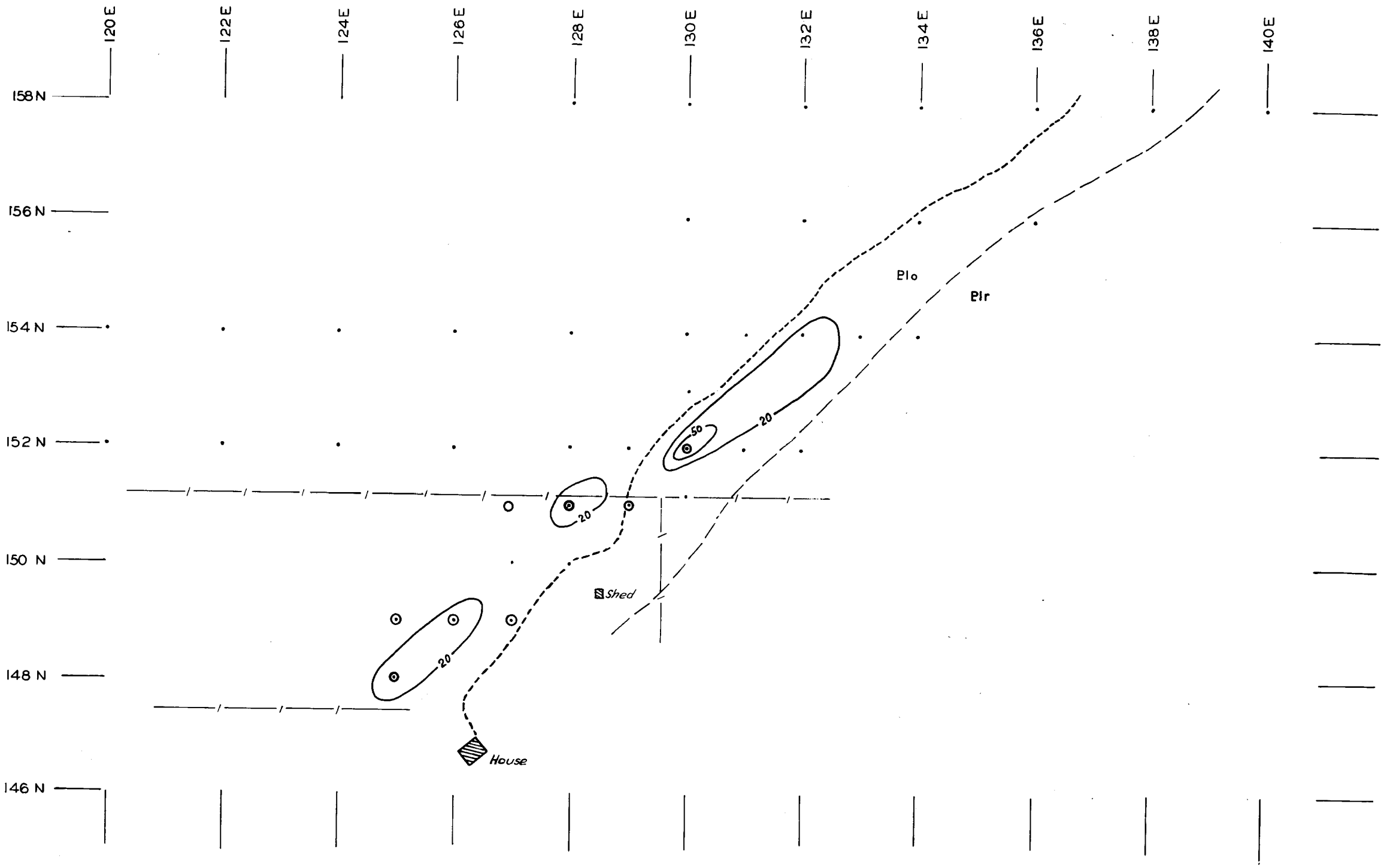
T.E.P. MINE GRID
1969 SURVEY

SCALE: 200 FEET TO 1 INCH

100 0 100 200 Ft.

B.M.R. DARWIN N.T. OCT. 1969 P.H.F.

PLATE 17



REFERENCE

- O ROTARY HOLE
- · AUGER HOLE
- BOUNDARY
- FENCE
- TRACK
- 20 RADIOMETRIC CONTOURS

BASED ON MAXIMUM VALUE IN AUGER HOLE BELOW 15 FEET DEPTH.

RATEMETER EMI TYPE 239

BY R.S. NEEDHAM

RADIOMETRIC CONTOURS

BELOW 15 FEET DEPTH

RUM JUNGLE DISTRICT N.T.

JEFFERYS No. 3

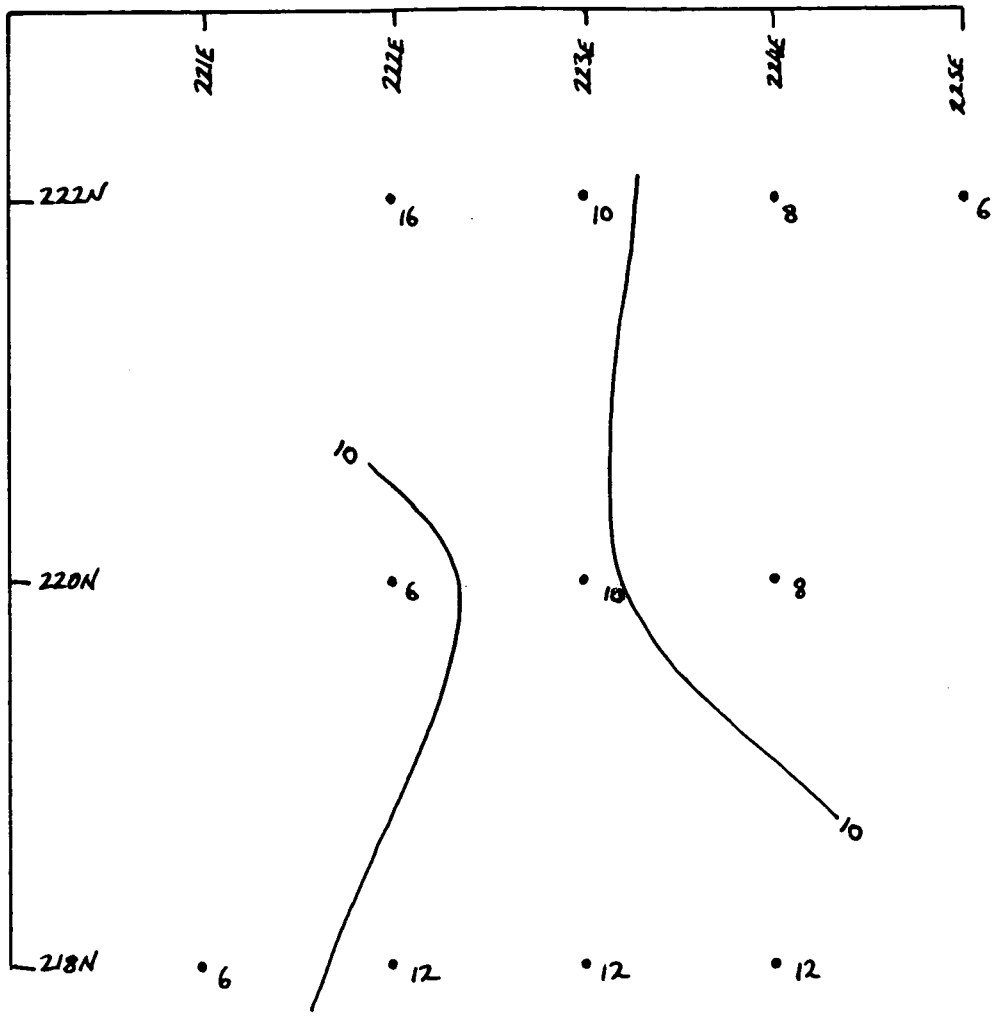
T.E.P. MINE GRID
1969 SURVEY

SCALE: 200 FEET TO 1 INCH

100 0 100 200 Ft.

B.M.R. DARWIN N.T. OCT. 1969 P.H.F.

PLATE 18



SIDING AREA 2

RADIOMETRIC SURVEY 1969

S. Needham

Auger Hole

(maximum values in hole are plotted)

Scale 1" :100'.

RUM JUNGLE GRID.

D52/87-532A

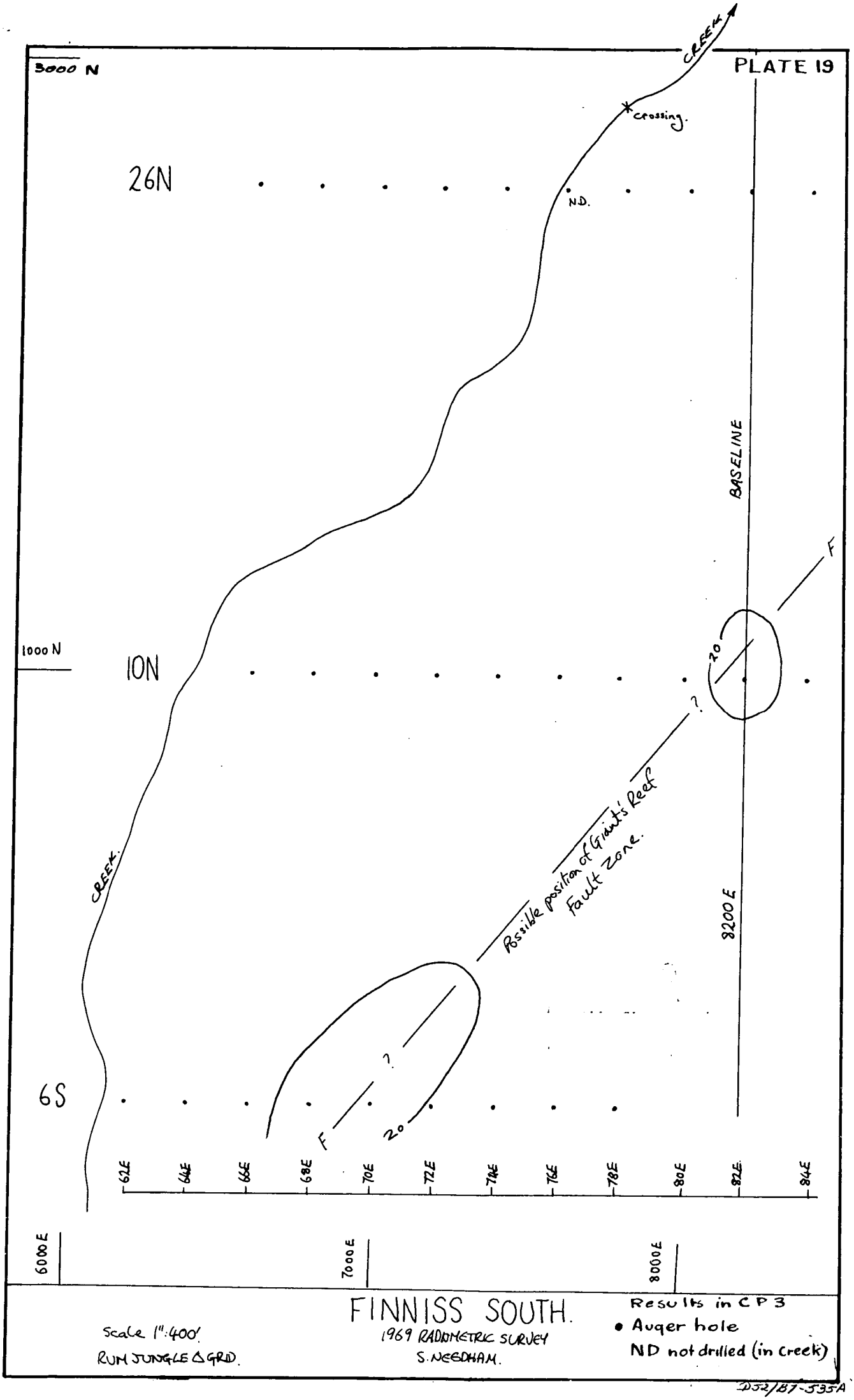
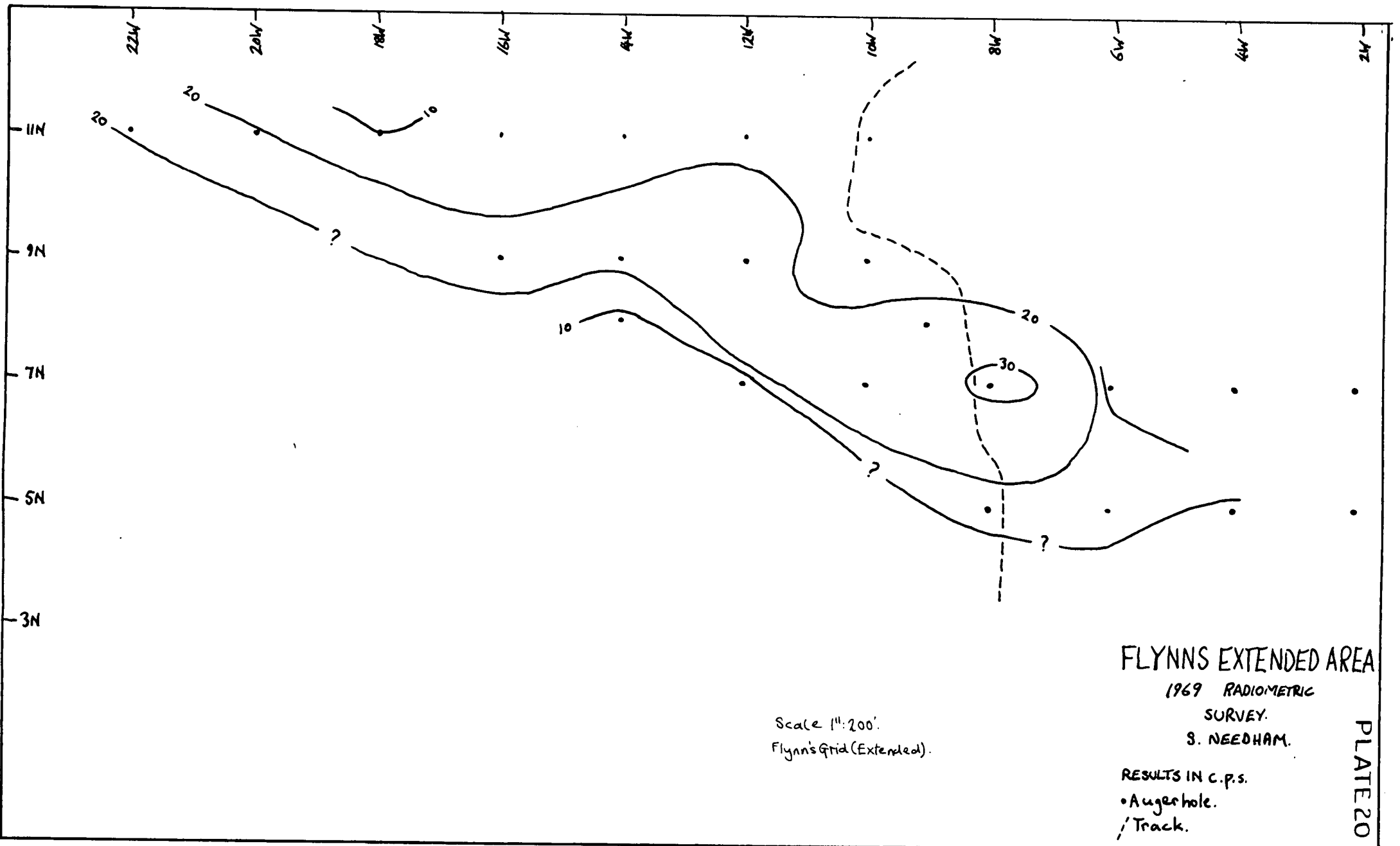


PLATE 19
3000 N
CREEK
crossing
26N
N.D.
BASELINE
F
1000 N
ION
20
?
CREEK
Possible position of Giant's Reef Fault zone.
8200 E
6S
?
F
20
62E
64E
66E
68E
70E
72E
74E
76E
78E
80E
82E
84E
6000E
7000E
8000E
FINNISS SOUTH.
1969 RADIOMETRIC SURVEY
S. NEEDHAM.
Scale 1":400'
RUM JUNGLE △ GRID.
Results in CP3
• Auger hole
ND not drilled (in creek)

D52/87-535A



FLYNNS EXTENDED AREA

1969 RADIOMETRIC SURVEY.

S. NEEDHAM.

Scale 1" : 200'.

Flynn's Grid (Extended).

RESULTS IN C.p.s.

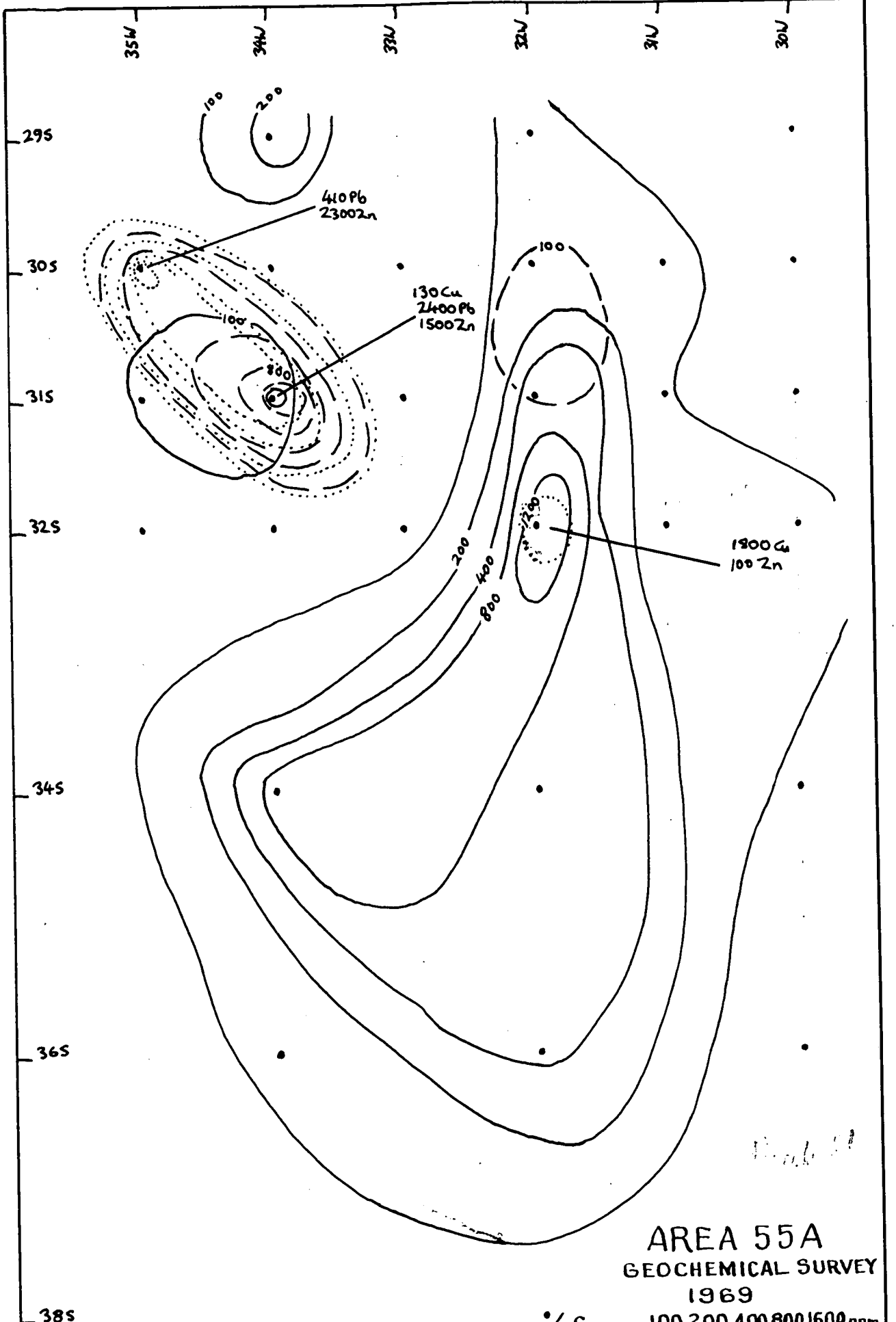
• Auger hole.

/ Track.

PLATE 20

DSD/87-5334

PLATE 21



AREA 55A

GEOCHEMICAL SURVEY

1969

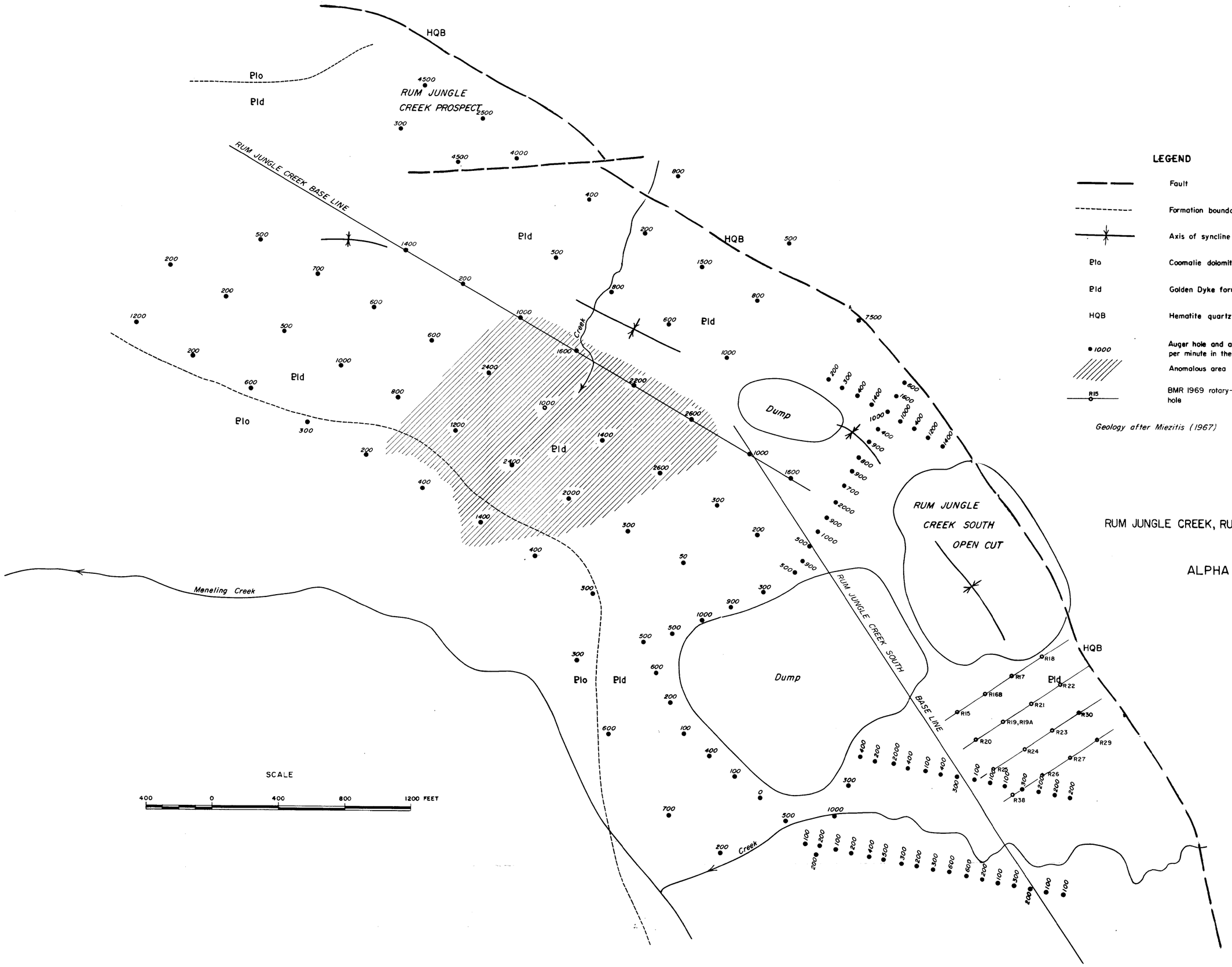
Copper 100, 200, 400, 800, 1600 ppm.

Pb 100, 200, 400, 800, 1600 ppm.

Zn 100, 200, 400, 800, 1600 ppm.

AREA 55 Grid

Scale 1" = 100'



LEGEND

- Fault
- Formation boundary
- Axis of syncline
- Plo — Coomalie dolomite
- Pld — Golden Dyke formation
- HQB — Hematite quartzite breccia
- 1000 — Auger hole and alpha counts per minute in the hole
- Anomalous area
- R15 — BMR 1969 rotary–percussion hole

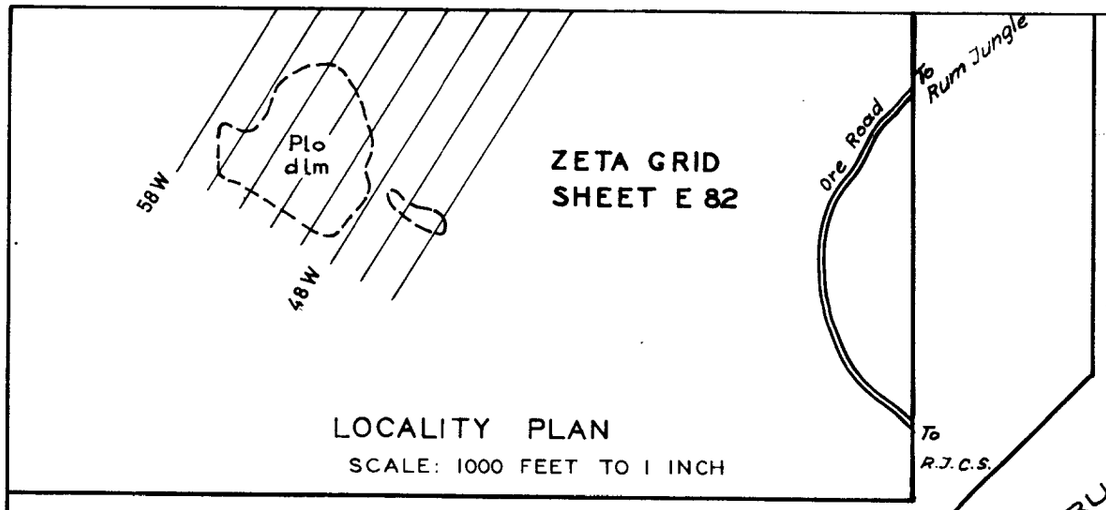
Geology after Miezitis (1967)

RUM JUNGLE CREEK, RUM JUNGLE CREEK SOUTH AREA

ALPHA SURVEY, 1969

D52/B7–509

PLATE 23



LOCALITY PLAN

SCALE: 1000 FEET TO 1 INCH

N

RUBBLE

FERRUGINOUS

Track

Fe

REFERENCE

- M — MARBLE, COARSE WHITE
- ▽▷ — BRECCIA, MOTTLED GREY
- ∴ — CARBONATE FINE GRAINED BROWN TO GREY
- Fe — HEMATITE
- ——— TRACK
- — — — LITHOLOGICAL BOUNDARY
- • 13 — SAMPLE No. 69120313

ZETA AREA
RUM JUNGLE DISTRICT N.T.
RECONNAISSANCE MAGNESITE SURVEY

SCALE: 100 FEET TO 1 INCH

100 0 100 200

BY D.J. FRENCH

B.M.R. DARWIN N.T. OCT. 1969

PLATE 14

Plc

Plb/Plc

Plb

Plb

Plc

BEACH FRACTIC

LITTLE COOMALIE CREEK.

Plc Golden Dyke Fmtn. non-outcropping.

Plb/Plc Transition Beds.

Bleach Calciutite.

Plb Coomalie Dolomite.

'Crystalline Dolomite'

Fine-grained limestone.

Non-outcropping quartz zone.

Quartzite.

Quartz-tranatone breccia

MAGNESITE SURVEY 1969.

PART OF THE HUANDOT AREA

RUM JUNGLE EAST GRID. SCALE 1" : 400'

GEOLOGY AFTER J.L. WILLIS, WITH ALTERATIONS.

12 Sample No

R.S. Wrecklem. 7/69.

400 0 400 800 FEET

52W 48W 44W 40W 36W 32W 28W 24W 20W 16W 12W

3048 3045 3126 346 3205 3245 3285

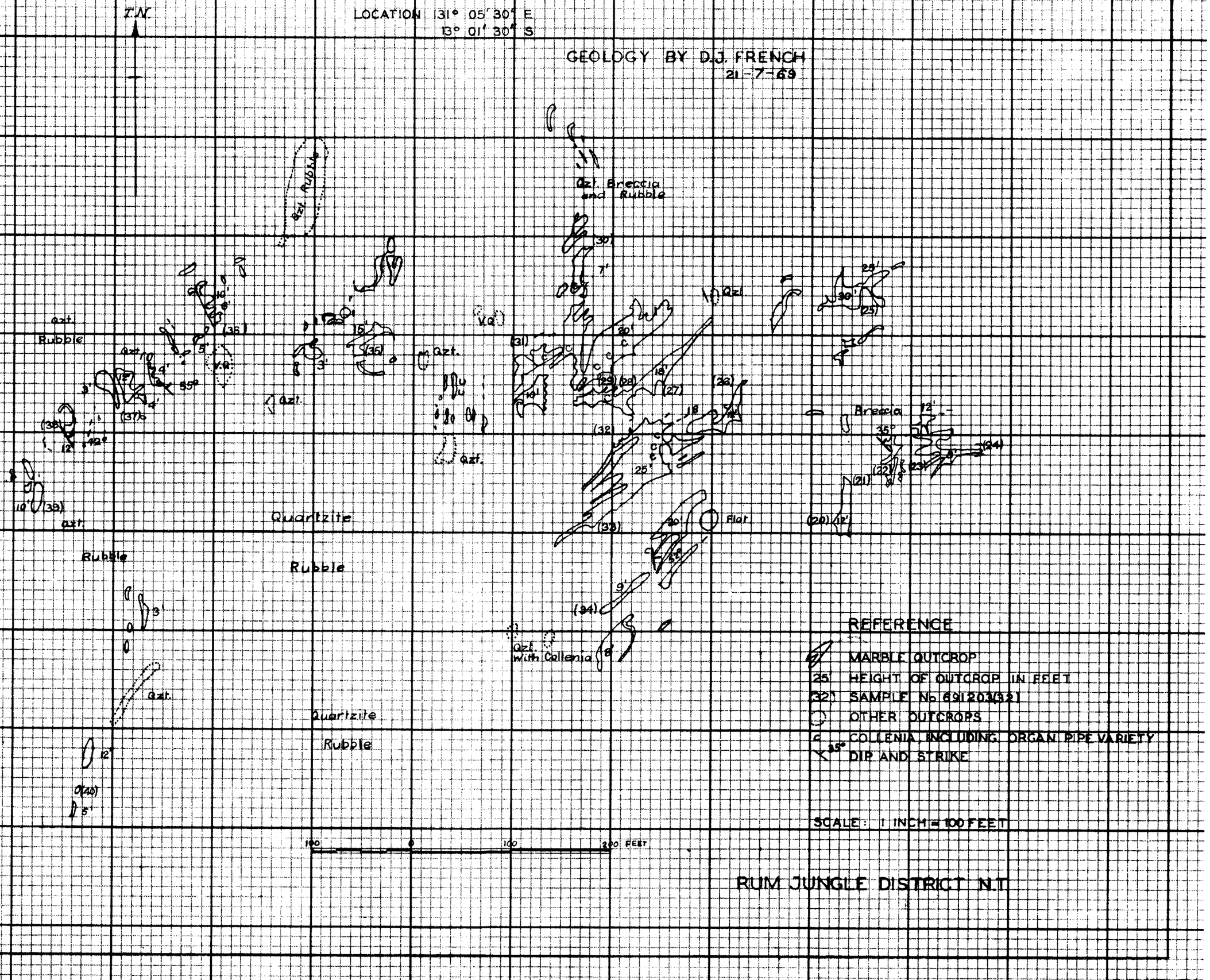
D055 - 373

PLATE 25

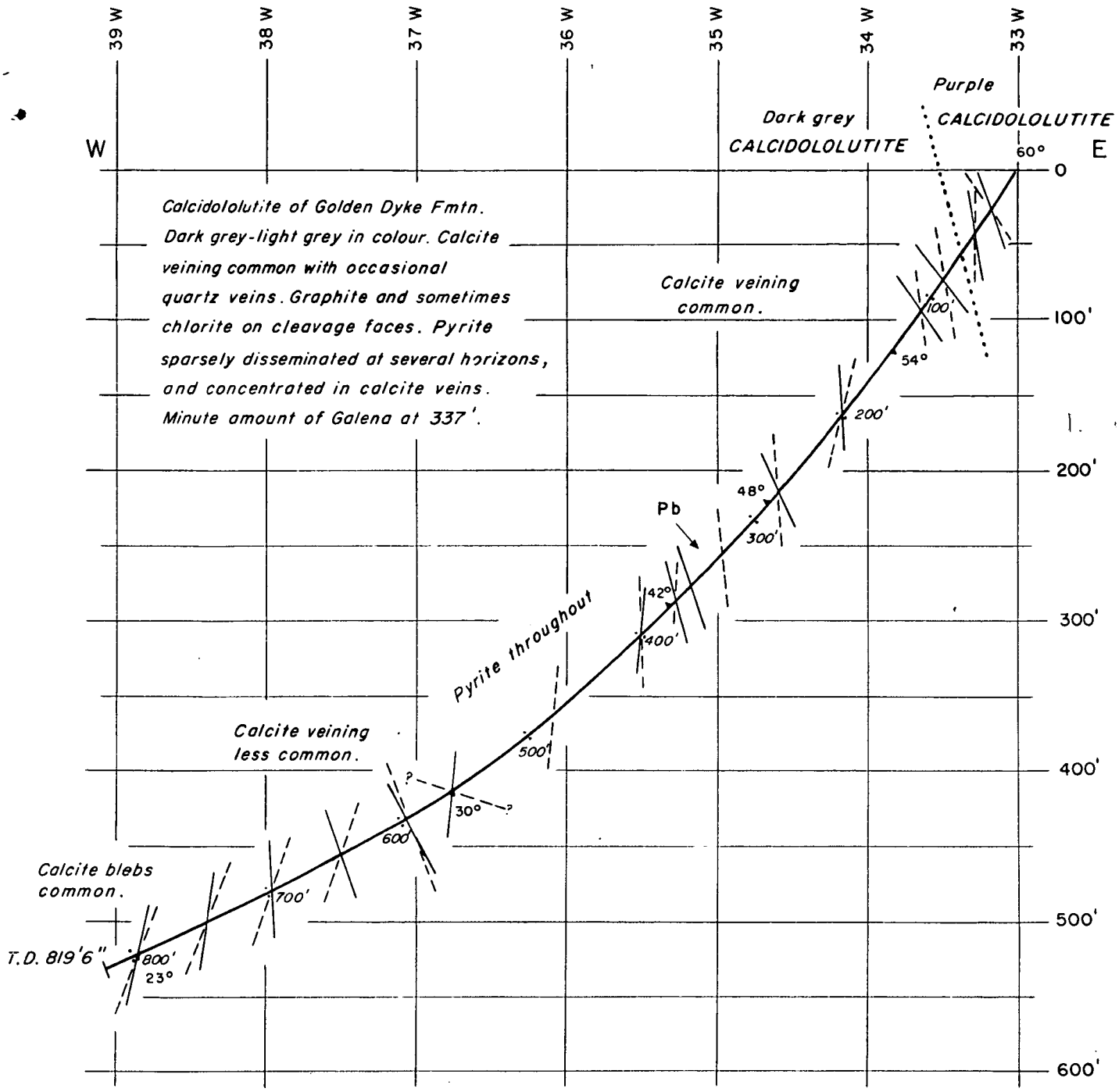
CELIA MAGNESITE LOCALITY

LOCATION 131° 05' 30" E
13° 01' 30" S

GEOLOGY BY D.J. FRENCH
21-7-69



RUM JUNGLE DISTRICT N.T.



Tropari Surveys:

150'	54°
290'	48°
400'	42°
600'	30°
800'	23°

300' Depth of core

45° Depression of hole

Dip of bedding

Dip of cleavage

Rock boundary

Pb Galena

SECTION 236 S
Rum Jungle East Grid
AREA 44 EXTENDED
D.D.H. 68-6.

100 50 0 100 200 feet

D52/A8/333

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT AREA 44 EXTENDED REMARKS RUM JUNGLE DISTRICT, N.T.

HOLE No. DDH 68-6 CO-ORDINATES 236 S 33 W R.L. GROUND DEPTH 819'

LOCATION ANGLE FROM HORIZONTAL -60° DIRECTION W

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
0'							
Weathered buff coloured shale, slightly ferruginous. Occassional fragments of grey quartzite.		NX		10			
22'							
DOLO/CALCILUTITE, purple with green bands 1/16". Quartz, chlorite and red iron-staining on cleavage faces. Occassional limonite on bedding. Grey calc. slate bands 1'-7'. Becoming light grey below 40'			40° opp. (45°) 50° opp. (54°)	21		*position of the larger slate bands.*	
50'				60			
		59°3"					
Purple with shale bands and rubbly beds.		BX	30°				
65'5"				83			
Quartzite vein with slate fragments.							
DOLO/CALCILUTITE, dark grey with occasional calcite veins.			20° (45°) opp.	96			
100'							
111'4" Aragonite (?) vein 4"							
116' Minor pyrite associated with calcite. Graphite smears on cleavage surfaces.				99			
			25-30° (45°) opp.				
150'				98			
Calcite veins < 1/16" and calcitic blebs, both associated with pyrite.							
				92			
Quartz / Magnesite ? vein.				97			
200'							

DRILL NO.

TYPE

CASING IN HOLE DURING DRILLING

EXPLANATION (40°) cleavage 40° bedding } (from core normal)

DRILLER

COMMENCED

COMPLETED

REFERENCES opp. : in opposite sense.

D52/A8/336(1)

HEAD OFFICE

LOGGED BY RSN

DRAWN BY

CHECKED BY

SHEET 1 OF 5

DRAWING NO.

GD130

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT AREA 44 EXTENDED REMARKS RUM JUNGLE DISTRICT, N.T.

HOLE No. DDH 68-6 CO-ORDINATES 236 S. 33 W R.L. GROUND DEPTH 819'

LOCATION ANGLE FROM HORIZONTAL -60° DIRECTION W

DESCRIPTION OF CORE	R.L. CASING / DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
200' *DOLO/CALCILUTITE, massive, dark grey. Pyrite on cleavage and disseminated faces.*	BX	50° (60°)	91			
Chlorite on cleavage faces.			100			
250' 253' *6" zone of massive finely crystalline pyrite assoc. with calcite veining.*			97			
Massive dark grey calci/dololutite with calcite veins <1". Pyrite disseminated throughout. Graphite and occassional chlorite on cleavage faces.		25° (45°) opp.				
300' 302' *Massive quartz vein, 15".*			100			
316' *2' zone of contorted, fractured calcilutite, extensively calcite-veined.*		(40°)				
337' *Calcite veins <1" containing pyrite and disseminated galena.*						
350'		25° 30° (45°) opp.	98			
Pyrite more definitely associated with, and restricted to, bands of calcite blebs // bedding, e.g. 401', 406'.			95			
400'						

DRILL NO.

TYPE

DRILLER

COMMENCED

COMPLETED

CASING IN HOLE DURING DRILLING

EXPLANATION

(45°) cleavage
25° bedding
} (from core normal)

REFERENCES opp. : in opposite sense.

D52/A8/336(2)

HEAD OFFICE

LOGGED BY RSN

DRAWN BY

CHECKED BY

SHEET 2 OF 5

DRAWING NO.

GD130

EJ

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT AREA 44 EXTENDED REMARKS RUM JUNGLE DISTRICT, N.T.

HOLE No. DDH 68-6 CO-ORDINATES 236 S 33 W R.L. GROUND DEPTH 819'

LOCATION ANGLE FROM HORIZONTAL -60° DIRECTION W

DESCRIPTION OF CORE	R.L. CASING / DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
400'						
DOLO/CALCILUTITE *Occasional calcite veining.* *Graphite and occasional pyrite on cleavage faces.*	BX	45° (43°) opp.	100			
450'						
Disseminated pyrite associated with veins and blebs of calcite.						
474'3"-487', *Intensely fractured calcilutite with extensive calcite veining. Graphite plentiful on all fracture surfaces. Pyrite increases downwards to form aggregates in calcite blebs. Chlorite common on cleavage faces.*		(45°)	90			
500'			100			
Pyrite in fracture zones <1".			99			
547'. *1" vein rich in pyrite.* 549'-564'. *Fracture zone with graphite.*			95			
550'						
564'3". *1" vein rich in pyrite.*			98			
582'. *1/2" vein rich in pyrite.*		35° (45°) opp.	100			
600'						

DRILL NO. ....
TYPE ....
DRILLER ....
COMMENCED ....
COMPLETED ....

CASING IN HOLE DURING DRILLING

EXPLANATION
(45°) cleavage } (from core normal)
35° bedding }

REFERENCES opp. : in opposite sense.

D52/A8/336(3)

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT AREA 44 EXTENDED REMARKS RUM JUNGLE DISTRICT, N.T.

HOLE No. DDH 68-6 CO-ORDINATES 236 S 33 W R.L. GROUND DEPTH 819'

LOCATION ANGLE FROM HORIZONTAL -60° DIRECTION W

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
606'. 6" intensive pyrite mineralization in 2' crush zone.		BX	2° (8°) opp.				
Occasional disseminated pyrite.							
Calcite veining becoming less abundant.			10° (45°) opp.	100			
Rock becoming lighter in colour; carbonate content increasing.							
692'6". 4" quartz band.			18° (45°) opp.				
720'6". 4 1/2" quartz band. Rock becoming darker in colour.							
733'6"-735'6". Quartz/calcite vein with pyrite.							
736'3". 1' calcite/quartz band with pyrite aggregates <1" diameter.			35° (45°) opp.	98			
				100			
780'. 1' lighter band with blebs of calcite < 1/10" diameter.			15°	97			
Calcite blebs common.							

DRILL NO. ..... TYPE .....

CASING IN HOLE DURING DRILLING

EXPLANATION (45°) cleavage, 10° bedding } (from core normal)

REFERENCES opp: in opposite sense.

DRILLER ..... COMMENCED ..... COMPLETED .....

D52/A8/336(4)

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT AREA 44 EXTENDED REMARKS RUM JUNGLE DISTRICT, N.T.

HOLE No DDH 68-6 CO-ORDINATES 236 S 33 W R.L. GROUND DEPTH 819'

LOCATION ANGLE FROM HORIZONTAL -60° DIRECTION W

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFTS CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
800'							
DOLO/CALCILUTITE, *dark grey. Occasional bands <1/2" of aggregated pyrite.*		BX		100			
Total depth 819'6"							
Tropari Surveys: 150' 54° 290' 48° 400' 42° 600' 30° 800' 23°							
Electrical and radiometric logs run. Core scraped for spectrographic analyses.							

DRILL NO ..... TYPE .....

DRILLER ..... COMMENCED ..... COMPLETED .....

EXPLANATION

CASING IN HOLE DURING DRILLING

REFERENCES

D 52/A8/336(5)

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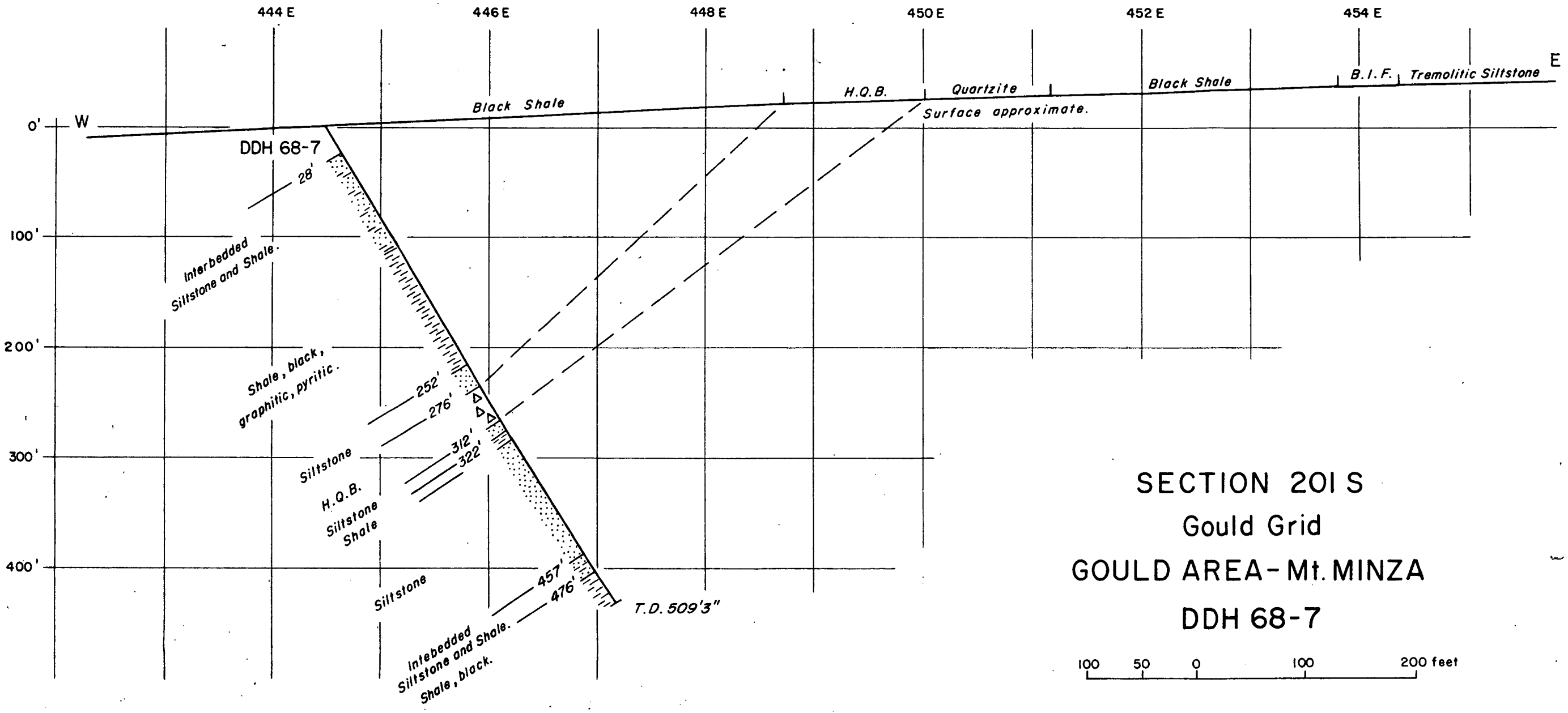

Acid tube container lost down hole - attitude of hole not known.

SECTION 201 S
Gould Grid
GOULD AREA - Mt. MINZA
DDH 68-7

100 50 0 100 200 feet

Surface geology after Shatwell, 1966.

D 52/A 8/334

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT GOULD AREA REMARKS RUM JUNGLE DISTRICT, N.T.

HOLE No. 68-7 CO-ORDINATES 201 S 444·5 E Gould Grid R.L. GROUND Length 509' 3"

LOCATION Mt. MINZA ANGLE FROM HORIZONTAL -60° DIRECTION Grid E.

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	RECOVERY %		REMARKS	ASSAYS
0							
No core recovery.		NQ 2 1/8"		Nil			
28'							
30'9" *as below*							
Thinly interbedded SILTSTONE, cream to grey, hard, siliceous, some soft, porous; and SHALE, dark grey to black, some carbonaceous;				98	5°		
Cleavage not well developed - apparently along bedding.							
Beds 1/8" - 2'.							
Red hematite staining along fractures and beds.							
Rare minor cherty quartz interbeds.							
100' 100'		BQ 1 7/16"					
SILTSTONE, cream to grey-green, well-bedded, beds 1/8 - 1" thick.				97	2°		
Hard, siliceous, argillaceous.							
122'3"							
Cavity				Nil			
126'3"							
SHALE, black, carbonaceous, siliceous, hard, graphitic, pyritic.				98	0-5°		
Gen. massive, rare thin interbeds of grey siliceous lutite < 1/4" thick.					30° (70°) same		
Pyrite often in beds assoc. with quartz, also disseminated.							
Graphite dissem. and along fractures, slickensides.							
Cleavage not well developed.				36	0° (45°)		
Radioactivity averages 0·08 mR/Hr. over interval, reaches peaks of 0·12 mR/Hr.				96	30° (>0°) same		
200'							

DRILL NO.

TYPE Mindrill w/L.

DRILLER M. Laska

COMMENCED

COMPLETED

EXPLANATION

CASING IN HOLE DURING DRILLING

1" = 20'

REFERENCES

10° Bedding
(30°) Cleavage
} measured as angle to core normal.

same = Same sense.

D52/A8/337-(1)

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D52/B7-340A

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT GOULD AREA REMARKS RUM JUNGLE DISTRICT, N.T.

HOLE No. 68-7 CO-ORDINATES 201 S 444·5 E Gould Grid R.L. GROUND Length 509'3"

LOCATION Mt. MINZA ANGLE FROM HORIZONTAL −60° DIRECTION Grid E.

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	CORE RECOVERY %		REMARKS	ASSAYS
SHALE as above, black, hard, siliceous, carbonaceous, graphitic, pyritic.		BQ 1 7/16"		99	30°		
				60			
229' SILTSTONE, pink, massive, silic.				100			
233' SHALE as above.				97			
252' SILTSTONE, pink to yellow-brown, grey, hard, siliceous, argillaceous; gen. bedded. Some mottled red-brown.				99			
275'6" HEMATITE QUARTZITE BRECCIA: Coarse angular fragments of white to light grey cherty or sugary quartz in a fine red-brown hematitic silty matrix. Minor chlorite occurs in irregular blobs, veinlets, and stringers.				99	40-45°		
312' SILTSTONE or FINE SANDSTONE, cream to grey, silic. and argillaceous.				99			
322' SHALE, black, hard, silic., occasional minor siliceous grey interbeds.		AQ 1 1/16"		100			
332' SILTSTONE, shaly, light to medium grey with abundant brick-red staining along fractures and sub-parallel to bedding. Bedding not distinct, cleavage not well developed. Rock is siliceous and argillaceous but yields no effervescence with HCl. Pyrite is rare.				100			
From 370-415 ft. rock is massive and homogeneous, with little ferruginous staining.							

DRILL NO

TYPE Mindrill W/L

DRILLER M. Laska

COMMENCED

COMPLETED

EXPLANATION

CASING IN HOLE DURING DRILLING

1" = 20'

REFERENCES

10° Bedding
(31°) Cleavage
} measured as angle to core normal.

D52/A8/337(2)

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D52/87-341A

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT GOULD AREA — REMARKS RUM JUNGLE DISTRICT, N.T.

HOLE No 68-7 — CO-ORDINATES 201 S 444·5 E Gould Grid — R L GROUND Length 509'3"

LOCATION Mt. MINZA — ANGLE FROM HORIZONTAL -60° — DIRECTION Grid E

DESCRIPTION OF CORE	R.L. CASING / DEPTH SIZE OF CORE	LOG	CORE RECOVERY %		REMARKS	ASSAYS
400'						
SILTSTONE as above, shaly, grey, gen. massive, some ferruginous staining along fractures and bedding.	AQ 1 1/16"		100	30-40°		
At about 435 ft., rock becomes predominantly red-brown.						
457'						
Thinly interbedded SHALE, black, carbonaceous, and SILICEOUS LUTITE, light grey, massive (siliceous dololutite ?)			100	20°		
476'						
SHALE, black, carbonaceous, siliceous, graphitic, pyritic. Massive except for minor pyritic beds.			100	20°		
500' 499'						
SHALE as above with minor cherty quartz veins (?) along bedding.			99			
509'3" TOTAL DEPTH						
Electrical and Radiometric logs run.						
Core scraped for spectroscan.						
Stratigraphy: 0 - 509'3" Pld.						
Surveys: None Acid tube container lost down hole.						

DRILL NO ...
TYPE Mindrill W/L
DRILLER M. Laska
COMMENCED ...
COMPLETED ...

EXPLANATION
CASING IN HOLE DURING DRILLING
1" = 20'

REFERENCES
10° Bedding
(37°) Cleavage
} measured as angle to core normal.
~~D52/A8/337~~(3)

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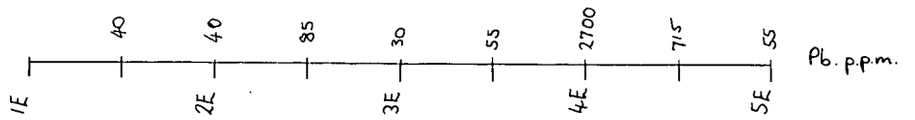
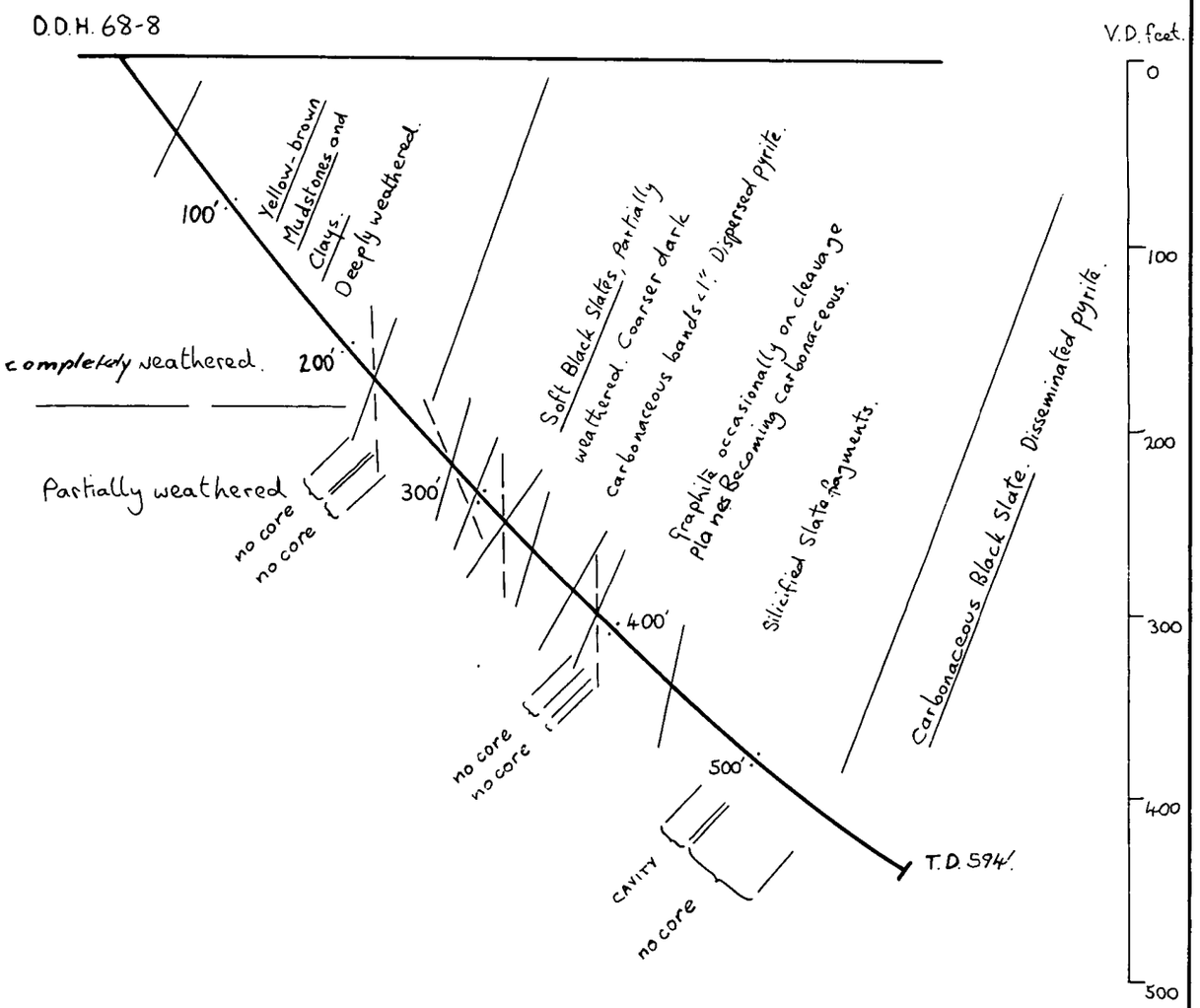
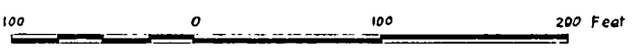




No Acid Bottle or Tropari surveys due to collapse of hole; Dip of hole projected from general pattern of 68-9, 16N 1E.

KEY: 100' Depth of hole.
Dip of bedding.
Dip of cleavage.
SCALE: 1" : 100'.

GOLDEN DYKE FORMATION THROUGHOUT.



SECTION 68-8.	
ACACIA AREA.	SCALE 1 inch : 100 feet.
CO-ORDINATES 24N 1E ACACIA GRID.	BEARING OF SECTION 90°T.

D52/B7-527A

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT... RUM JUNGLE
HOLE No.... 68-8 ..... CO-ORDINATES 24N 1E ..... REMARKS.... DEPTH 594'
LOCATION ACACIA AREA. ..... R L GROUND .....
ANGLE FROM HORIZONTAL.... 50° DIRECTION EAST

DESCRIPTION OF CORE	R.L. CASING / DEPTH SIZE OF CORE	LOG	CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
0						
COMPLETELY WEATHERED YELLOW-BROWN ROCK and GREY CLAYS. Bedding 20-30° from core normal.	N		NIL		WEATHERED.	
100						
180' WEATHERED ROCK. FAWN MUDSTONES AND CLAYS. Iron-stained in parts. 190'-207' recovered as sludge.	B	62				
200						

DRILL NO.....
TYPE ~~MINDRILL~~ WIRELINE.....
DRILLER.... FARNOR.....
COMMENCED.. 31/10/68.....
COMPLETED.. 25/1/69.....

CASING IN HOLE DURING DRILLING

EXPLANATION 1" : 20'. 75° - bedding to core normal (35)° - cleavage

REFERENCES

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT. RUM JUNGLE. REMARKS. DEPTH. 594'.
HOLE No. 68-8. CO-ORDINATES 24N. 1E. R.L. GROUND
LOCATION ACACIA AREA. ANGLE FROM HORIZONTAL 50° DIRECTION EAST.

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
200'							
YELLOW-BROWN MUDSTONES and CLAYS.		B. A.	60 (45)	50	WEATHERED.	Sludge samples collected at: 200', 210', 220', 225', 230', 235', 240', 245', 250', 255', 260', 265', 270'.	
219'6"							
221'9" BLUE SHALE BAND.							
YELLOW-BROWN MUDSTONES and CLAYS.							
235'							
Sandy slurry returned.				NIL			
No core							
249'							
250' FAWN MUDSTONES.				90.			
No core				NIL			
260'							
BLACK SLATES. Weathered and soft. Coarser carbonaceous bands <1".			58 (20)				
300'			65	87	PARTIALLY WEATHERED.		
Pyrite occurs from 320' as finely disseminated bands along bedding, and occasionally on cleavage faces.			80 (45)				
			60				
355'6"							
BLUE MUDSTONES and SLATES recovered as sandy slurry. 359'9"				10			
BLACK SLATES. Weathered and soft. Carbonaceous bands <1".							
369'. Calcite vein ⅛".			75				
376'3"				90			
GREY SLATES. Coarser; pyrite common. 378'9"							
BLACK SLATES Soft. Coarser darker carbonaceous bands <½".							
394'6"			70 (45)				
400' No core, Blue muds returned.				NIL			

DRILL NO.
TYPE NINDRILL WIRELINE
CASING IN HOLE DURING DRILLING

EXPLANATION 60 Bedding to core normal.
1" : 20' (45) Cleavage " "

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DRILLER FARNOR
COMMENCED 31/10/68
COMPLETED 25/1/69

REFERENCES

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: RUM JUNGLE. REMARKS:

HOLE No: 68-8 CO-ORDINATES: 24N 1E R L GROUND:

LOCATION: ACACIA AREA ANGLE FROM HORIZONTAL: 50° DIRECTION: EAST

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
400′							
No core Blue mud returned.		A		NIL			
404′ BLACK SLATE. Soft. Coarser carbonaceous bands <½″.				20			
414′ No core				NIL			
419′ BLACK SLATE. Soft. Graphite on cleavage faces.				80			
440′ Coarse dark carbonaceous bands <1″, with associated pyrite.			60 (50)				
460′ Black slate becoming carbonaceous.				40			
485′ 5″ of silicified Black slate recovered.							
489′ CAVITY.				NIL			
500′							
505′ Soft slate fragments recovered					PARTIALLY WEATHERED		
No core				5		GOLDEN DYKE FMTN. throughout. Radiometric log run. No major anomalies recorded. No Tropari or Acid Bottle surveys due to collapse of hole. Core scraped for Spectroscan.	
545′ CARBONACEOUS BLACK SLATE. Coarse, with disseminated pyrite.				20			
TOTAL DEPTH 594′							

DRILL NO:

TYPE: MINDRILL WIRELINE

CASING IN HOLE DURING DRILLING

EXPLANATION: 1″: 20′ — 60 Bedding to core normal. (50) Cleavage

REFERENCES

DRILLER: FARNOR

COMMENCED: 31/10/68

COMPLETED: 25/1/69

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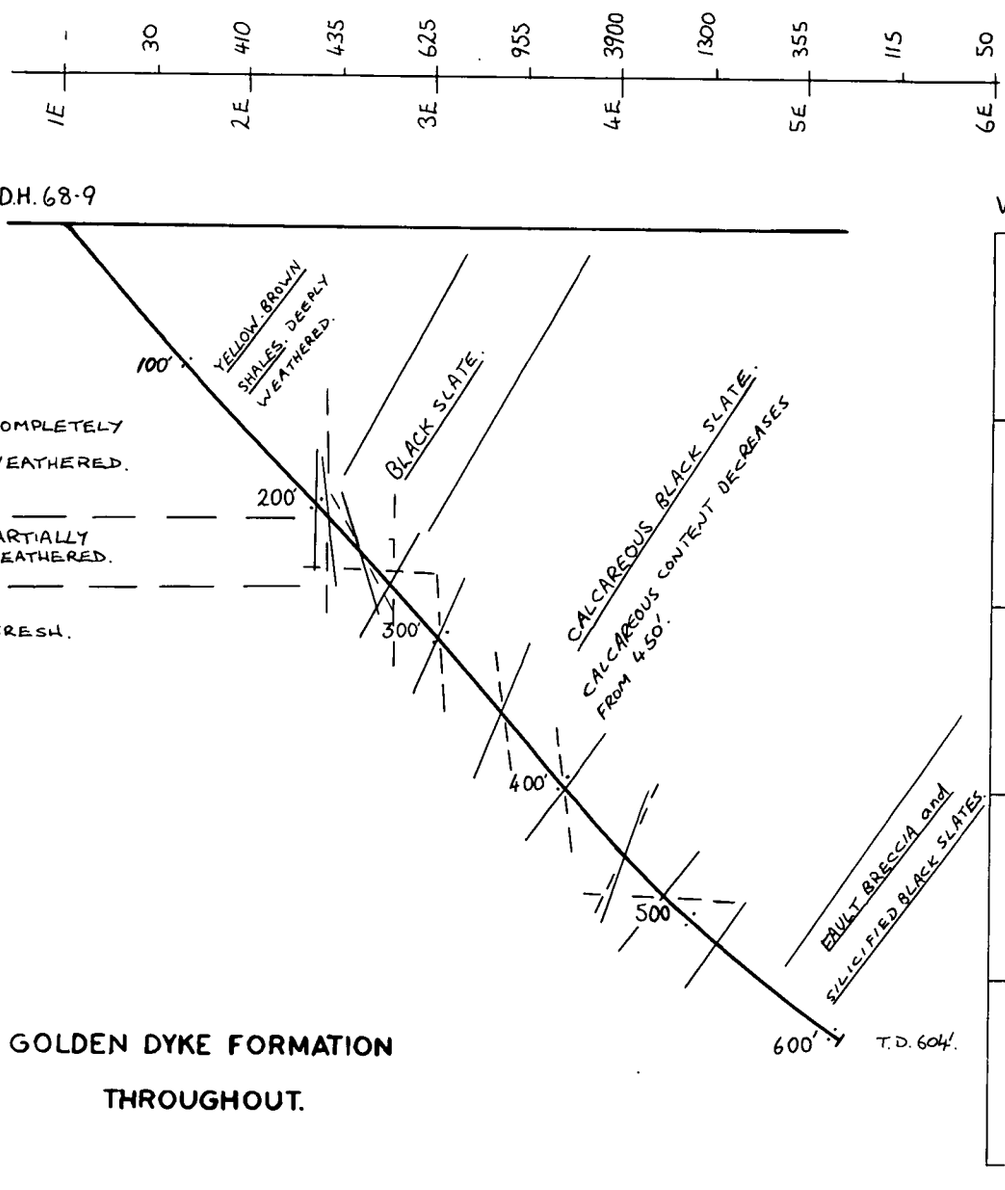

SECTION D.D.H. 68-9.	
ACACIA AREA.	SCALE 1 inch : 100 feet.
CO-ORDINATES 16N 1E ACACIA GRID.	BEARING OF SECTION 90°T.

D52/187-5026A

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT . . . RUM JUNGLE . . . . . REMARKS . . . . . .

HOLE No . . . . 68-9 . . . . . CO-ORDINATES . . 16N 1E . . . . . ACACIA GRID . . . . . R L GROUND . . . . . .

LOCATION . . . ACACIA AREA . . . . . ANGLE FROM HORIZONTAL . . . 50° . . . DIRECTION EAST . .

DESCRIPTION OF CORE	R.L. / CASING	DEPTH / SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
0							
NO CORE. Completely weathered rock; yellow, yellow-brown, probably lutite.		N		NIL	COMPLETELY WEATHERED.		
100							
194' BLACK SLATE and LIGHT BROWN SHALES. iron-stained in patches and bands.			46°	93			
200							

DRILL NO . . . . . TYPE . . MINDRILL . WIRELINE . . .

CASING IN HOLE DURING DRILLING

EXPLANATION 1" : 20'

46° - Bedding to core normal (45°) - Cleavage

DRILLER . . . FARNOR . . . . . COMMENCED . . 16/11/68 . . . . . COMPLETED . 29/12/68 . . . . . .

REFERENCES

ss. - same sense.
os. - opposite sense.

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT: RUM JUNGLE — REMARKS:

HOLE No: 68-9 — CO-ORDINATES: 16N 1E ACACIA GRID — R.L. GROUND:

LOCATION: ACACIA AREA — ANGLE FROM HORIZONTAL: 50° — DIRECTION: EAST

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
200'		N		2½	WEATHERED		
BLACK SLATE. Soft, weathered. Occasional leached limonite bands to 203', at 80° to core normal. Pyrite on cleavage faces. Very broken ground.		B	40 (45)	20	PARTIALLY WEATHERED.		
240' Coarse dark carbonaceous bands <¼". Associated disseminated pyrite.			32 (20°)ss				
250'			(40) os	95			
Gradational. Calcite content increasing.			75				
270'				100			
CALCAREOUS BLACK SLATE. Calcite veining ⅛". Disseminated pyrite. Graphite on cleavage faces. Very minor galena at 278' associated with ⅛" calcite veining and pyrite.			70 (45)				
300' Coarse Carbonaceous bands <1" with pyrite.				65	FRESH.		
			70 (40-45)				
				96			
			80-90 (45)				
400'							

DRILL NO:

TYPE: MINDRILL WIRELINE

DRILLER: FARNOR

COMMENCED: 16/11/68

COMPLETED: 29/12/68

CASING IN HOLE DURING DRILLING

EXPLANATION: 1" : 20'. 40° - Bedding to core normal. (45) - Cleavage " "

REFERENCES: ss. - same sense. os. - opposite sense.

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SHEET 2 OF 4

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GD130

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT. RUM JUNGLE. REMARKS.

HOLE No 68-9 CO-ORDINATES 16N 1E. ACACIA GRID R L GROUND

LOCATION ACACIA AREA. ANGLE FROM HORIZONTAL 50° DIRECTION EAST.

DESCRIPTION OF CORE	R L. CASING	DEPTH SIZE OF CORE	LOG	CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
400′							
CALCAREOUS BLACK SLATE. Calcite veining ⅛″. Disseminated pyrite. Graphite on cleavage. Carbonaceous bands <1″.		B	80	75	FRESH.		
450′ Calcareous content decreases. Broken ground around 450′.			64 (66)				
			68				
			80 (45) os	95			
500′							
			75				
536′. Pyrite as haloes around small (⅛″) Carbonaceous blebs.							
550′ Pyrite commonly associated with calcite veins.							
559′9″ Isolated Chalcopyrite crystal (4mm). 6″ of 50% Pyrite at 562′.							
563′ FAULT ZONE. FAULT BRECCIA. Deeply weathered, soft iron-stained; Matrix yellow/brown.				25	WEATHERED.		
596′ SILICIFIED SLATE. Dark grey/brown. 600′					FRESH.	Secondary (weathered) sulphides.	

DRILL NO.

TYPE MINDRILL WIRELINE.

CASING IN HOLE DURING DRILLING

EXPLANATION 1″:20′ 80-Bedding to core normal. (66)-Cleavage.. .. ..

REFERENCES ss - Same sense. os - opposite sense.

DRILLER FARNOR

COMMENCED 16/11/68

COMPLETED 29/12/68

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT .... RUM JUNGLE ..... REMARKS .....

HOLE No .... 68-9 ..... CO-ORDINATES .... 16N 1E ACACIA GRID. ..... R L GROUND .....

LOCATION ... ACACIA AREA ..... ANGLE FROM HORIZONTAL ... 50 ... DIRECTION EAST.

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
600'							
SILICIFIED SLATE. Dark grey/brown. Broken ground.		B		25	FRESH	Secondary oxidized sulphides	
T.D. 604'.							
GOLDEN DYKE FORMATION THROUGHOUT.							
Tropari survey: 480' 41° 090							
Acid Surveys: 200' 45° / 300' 48° / 400' 50° / 600' 38° } corrected.							
Electric and Radiometric Logs run. No major anomalies recorded.							
Core scraped for Spectroscan.							

DRILL NO .....
TYPE .... MINDRILL WIRELINE.
DRILLER .... FARNOR .....
COMMENCED .. 16/11/68 .....
COMPLETED . 29/12/68 .....

CASING IN HOLE DURING DRILLING

EXPLANATION 1" : 20'

40° Bedding to core normal.
(45°) Cleavage .. .. ..

REFERENCES

ss - same sense.
os - opposite sense.

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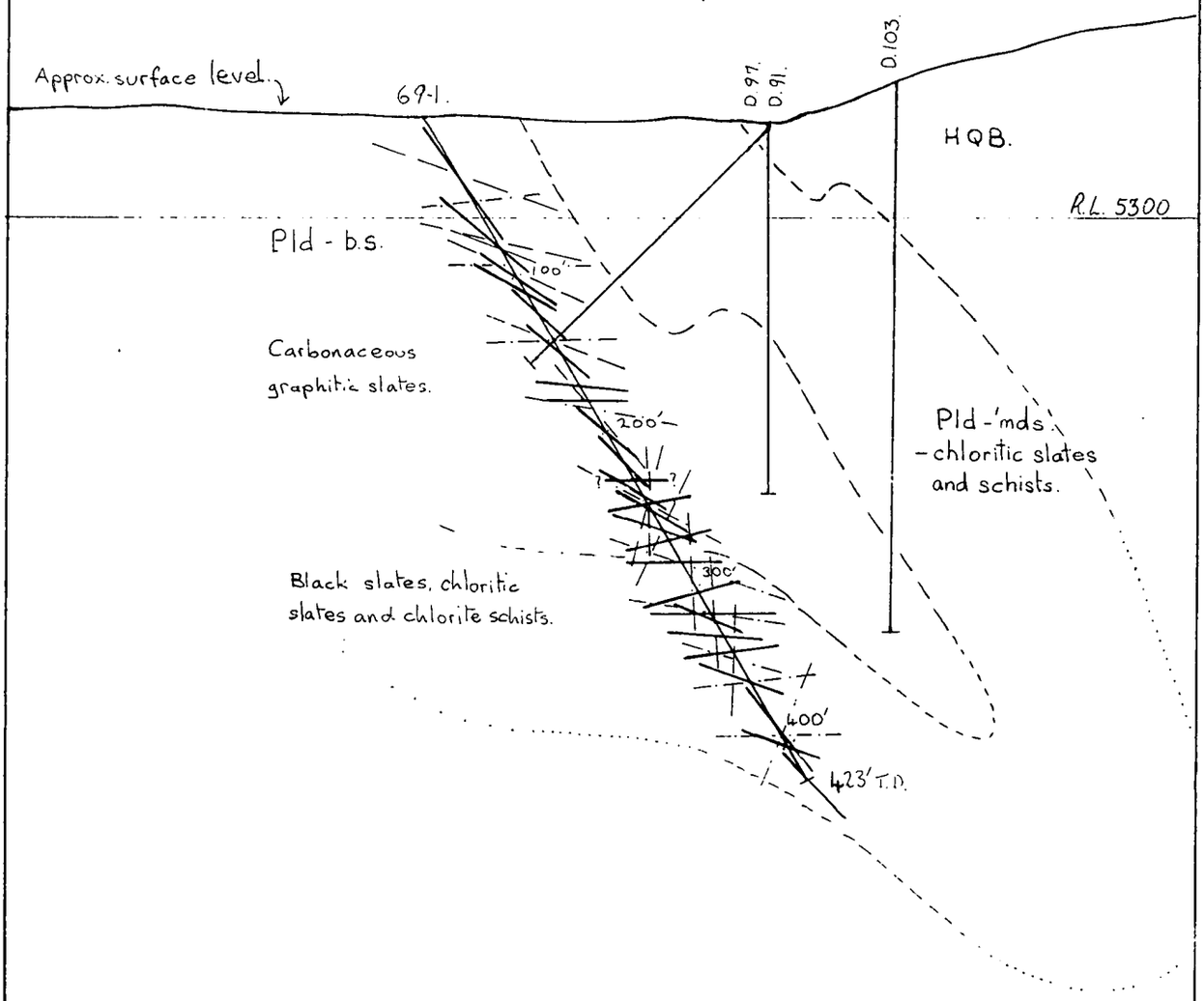

KEY

- Direction of bedding.
- Two directions of cleavage: Regional. Axial Plane.
- 100 Depth of hole in feet.
- Lithological boundary, becoming less probable.

ACID SURVEYS.

Depth: 200' Corrected reading: 59°.
" 400' " " 60°.

100 0 100 200 Feet

SECTION D.D.H. 69-1.	
WHITE'S EXTENDED.	SCALE 1 inch = 100 feet.
CO-ORDINATES N 30208 E 33560 MINE GRID.	BEARING OF SECTION 90°T.
	GEOMETRY OF HOLE: -60° EAST.

D52/87-528A

C.S.N. 11/3/69

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT. RUM JUNGLE DISTRICT. REMARKS.

HOLE No. 69-1 CO-ORDINATES 30205N. 33367E. MINE GRID. R.L. GROUND DEPTH 423'

LOCATION WHITES EXTENDED. ANGLE FROM HORIZONTA. 60° DIRECTION EAST.

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
NO CORE. WEATHERED RED/GREY ROCK.				NIL			
31'	NX.		80-90 (50)		WEATHERED.		
WEATHERED BLACK SLATES. red. ferruginous on bedding and cleavage. cleavage irregular.				90			
			70-90	60			
61'6" Massive quartz vein, 1". Ferruginous film in vugs and on fractures.				70			
65'			80 (25)	50			Radiometric: peak at 62'10" (< x 6 background)
BLACK SLATES. CARBONACEOUS, graphite on cleavage. Pyrite common as disseminated bands < ⅛" on cleavage. and as fine bands and blebs on bedding < ½". Cleavage becomes regular from 90'.				80		75'-76'3" pale yellow radioactive crumbly material - secondary mineralization.	45'-76'3" < x 3 background.
			70	95			
			45-60 (45)				
			45-50 (35,55,45)	80			
100' Chlorite blebs on cleavage.	NXWL		65 (0-5, 55)				
			60 (55)				
115½'. Minor chalcopyrite occurs.			80 (70)				
			65ss (55)		FRESH.		
			90				
			(25) (50)				
150'3". 2" Quartz vein with pyrite.				90			
			75 65os (40)				
			10-40				
			70 (40-50)				
180'3". 6" slump zone. Pyrite and quartz along bedding.			30 (40)				
			50 (40, 80)				
188'3". 40% pyrite in 6" quartz vein.							
			80-90 (50)				
			70				

DRILL NO.

TYPE ... MINDRILL. WIRELINE.

CASING IN HOLE DURING DRILLING

EXPLANATION 1" : 20'

80 - Bedding to core normal.
(50) - Cleavage to core normal.
os - opposite sense.
ss - same sense.

DRILLER ... FARNOR.

COMMENCED ... 23/1/69.

COMPLETED ... 26/2/69.

REFERENCES

HEAD OFFICE

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT. RUM JUNGLE DISTRICT. REMARKS.

HOLE No. 69-1 CO-ORDINATES 30205 N. 33367 E. MINE GRID. R.L. GROUND DEPTH 423'

LOCATION WHITES EXTENDED. ANGLE FROM HORIZONTAL 60° DIRECTION EAST.

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS

200

CARBONACEOUS SLATE. black and graphitic, with pyrite mainly along bedding as hair-like bands or small blebs <2m.m. Massive pyrite often occurs with quartz in areas of contorted bedding.

228'. 10% pyrite in 6" contorted zone.

210 220 230 240 250

256'6". Talc smear.

260

267'9". 4" quartz vein with 20% pyrite.

270 270'. Talc on cleavage.

278'5"

280 CHLORITE SCHISTS. pyrite common along cleavage. <½" bands. Talc at 280'.

287'

290 BLACK SLATES. Talcose. Pyrite veining <½" and massive <1" in areas of contorted bedding. Minor quartz veining parallels cleavage. Occasional very minor haematite. Chlorite appears from 298'.

300

308'9". Becoming schistose.

310

317'6"

319'3" CHLORITE SCHIST.

320 322'. CHLORITIC BLACK SLATES. Graphitic.

323'9" CHLORITE SCHIST. Minor chalcopyrite.

CHLORITIC BLACK SLATES. Graphite on cleavage. Pyrite parallels bedding, <3" in areas of contorted bedding. Minor chalcopyrite.

330 340 350

360

363'9"

CARBONACEOUS SLATE. black and graphitic. Very broken, often with crumbly appearance. Pyrite <¼" often associated with quartz veining, <⅛".

370 380 390

400

NWL

B.

90 (35)
85 (40)
90 (65)
30? (45)
80-90 (50)
85 os (70)
22? (60)
30? (75)
60 os (55. 90)
0-20 (60)
40 os (45)
30 (60)
0-25 (55) (40)
40 (40 os, 50 ss)
20-40 os (50-70)
10
(50)
15 (70)
(45)
0-10.
30 (45)
(60)
70 os (65)
40
10-20 os (60)
0-20
30
40-60 (30)
80-90 (40-50)
80-90 (20-30) (40)
65 (15)
60-85 (60)

90 90 92 90 80 85 80 90 90

FRESH.

DRILL NO.

TYPE ... MINDRILL WIRELINE.

DRILLER FARAOR

COMMENCED ... 23/1/69.

COMPLETED ... 26/2/69.

CASING IN HOLE DURING DRILLING

EXPLANATION 1" : 20'.

90 Bedding to core normal. (35) Cleavage to core normal. os opposite sense. ss same sense.

REFERENCES

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DRAWING NO.

GD130

6/3/69 EJ

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: RUM JUNGLE DISTRICT. REMARKS: MINE GRID. R L GROUND: DEPTH 423'.
HOLE No: 69-1. CO-ORDINATES: 30205 N 33367 E. ANGLE FROM HORIZONTAL: 60° DIRECTION: EAST.
LOCATION: WHITES EXTENDED.

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
400							
CARBONACEOUS SLATE. black and graphitic. Carbon decreases from 403'.		B.	(40)	90	FRESH.		
410 411'3" fragments indicate cave-in. 411'4"			90(60)		WEATHERED		
CHLORITE SCHISTS. Dark green and red in colour. Weathered from 411'4" to 412'6"			(30-60)	80	FRESH.		
420 Total Depth 423'.						Tailings encountered at 423'. Drilling stopped.	
430						Radiometric log run:	
						Acid bottle survey: 200' - 59° 400' - 60°	

DRILL NO.....
TYPE ...MINDRILL. WIRELINE...
DRILLER ...FARNOR.....
COMMENCED ..23/1/69.....
COMPLETED ..26/2/69.....

CASING IN HOLE DURING DRILLING

EXPLANATION 1" : 20'. 90 bedding to core normal, (40) cleavage to core normal.

REFERENCES

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT RUM JUNGLE DISTRICT N.T. REMARKS DEPTH 535'

HOLE No 69-2 CO-ORDINATES 33855E 30320N MINE GRID R.L. GROUND

LOCATION DYSONS EXTENDED ANGLE FROM HORIZONTAL -70° DIRECTION 120° T.

DESCRIPTION OF CORE	R.L. CASING / DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
0						
INTERBEDDED PURPLE/PINK SILICIFIED QUARTZ SANDSTONE AND GREY/YELLOW LIMONITE STAINED MUDSTONES (Weathered)						
Partings at 30° to core normal.						
40' HEMATITE QUARTZ BRECCIA Broken and weathered to 56'-3" Quartz frargments often drawn out. Chlorite on fracture surfaces Quartz fragments < 3" Partings at 50° to core normal.			NIL			
Weathered 68' to 71' Broken from 71'			88			
Parting at 30° to core normal.						
Partings at 60° to core normal, with chlorite.						
100 Boundary 40° to core normal.						
102' RED SILICIFIED QUARTZ SANDSTONE Quartz veins < 1/8" Chlorite on fractures			90		Partings at 25° and 90° to core normal	
110' HEMATITE QUARTZ BRECCIA			80			
Parting at 75° to core normal						
132' RED SILICIFIED QUARTZ SANDSTONE			95		Parting 40° to core normal	
134'6" gradationary (1') HEMATITE QUARTZ BRECCIA Chlorite on fractures.			90			
151' RED SILICIFIED QUARTZ SANDSTONE Fractured. Fine quartz veining.			95			
159' HEMATITE QUARTZ BRECCA			90			
190'-210' Quartz fragments > 50% of rock.						
200						

DRILL NO

TYPE MINDRILL WIRELINE

CASING IN HOLE DURING DRILLING

EXPLANATION 1 inch = 20 feet

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DRILLER FARNOR

COMMENCED 12-3-69

COMPLETED 29-8-69

REFERENCES

SHEET 1 OF 3

DRAWING NO

GD130

EJ

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT RUM JUNGLE DISTDRICT N.T. REMARKS DEPTH 535'

HOLE No. 69-2 CO-ORDINATES 33855 E 30320 N R.L. GROUND

LOCATION DYSONS EXTENDED ANGLE FROM HORIZONTAL -70° DIRECTION 120° T

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
200'							
HEMATITE QUARTZ BRECCIA Parting 35° to core normal				90			
218'							
RED SILICIFIED QUARTZ SANDSTONE Occasional bands H.Q.B < 6" Partings 30° and 0° to core normal				80			
246'6"							
HEMATITE QUARTZ BRECCIA 258' - 262' Quartz fragments > 50% of rock				65			
266'6"							
RED SILICIFIED QUARTZ SANDSTONE Occasional bands H.Q.B < 6"				68		Parting 45° to core normal	
276'							
HEMATITE QUARTZ BRECCIA				65			
300'							
300' - 315' Quartz fragments > 60% of rock				Nil			
Partings 45° to core normal				85			
Chlorite as 30% of matrix 353' - 354'							
356'6"							
RED SILICIFIED QUARTZ SANDSTONE				100		Parting 25° to core normal	
361'6"							
HEMATITE QUARTZ BRECCIA Chlorite on 'cleavage'.				96			
				8			
400'				90			

DRILL NO.

TYPE MINDRILL WIRELINE

CASING IN HOLE DURING DRILLING

EXPLANATION 1 inch = 20 feet

DRILLER FARNOR

COMMENCED 12-3-69

COMPLETED 29-8-69

REFERENCES

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT RUM JUNGLE DISTRICT N.T REMARKS DEPTH 535'

HOLE No 69-2 CO-ORDINATES 33855 E 30320N MINE GRID R.L. GROUND

LOCATION DYSONS EXTENDED ANGLE FROM HORIZONTAL -70° DIRECTION 120°T

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
400' HEMATITE QUARTZ BRECCIA				90			
406'7" RED SILICIFIED QUARTZ SANDSTONE Minor quartz veining.				96			
418' HEMATITE QUARTZ BRECCIA Bands red silicified quartz sandstone < 2'						Partings 0-30° to core normal	
Quartz fragments much larger (≈4") from 432' to 490'.				95			
469'10" Good contact between sandstone and H.Q.B. at 10° to core normal. (1 inch sst. band)							
479'2" Sandstone band 25° to core normal.							
486' CHLORITE HEMATITE QUARTZ BRECCIA Chlorite as 10-80 % of matrix				85		Partings 40-45° to core normal.	
493'6" SOFT HEMATITE CLAYSTONE. fragments soft Hematite quartz breccia, hematitic silt and quartz sand. 500'				35		Silt and sand returned	
Total Depth 535' Hole abandoned due to difficult drilling conditions.							
600'							

DRILL NO

TYPE MINDRILL WIRELINE

DRILLER FARNOR

COMMENCED 12-3-69

COMPLETED 29-8-69

CASING IN HOLE DURING DRILLING

EXPLANATION 1 inch = 20'feet

REFERENCES

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SHEET 3 OF 3

DRAWING NO

GD130

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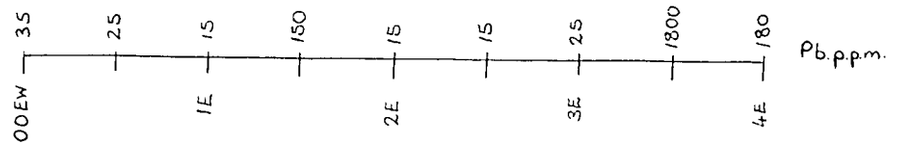

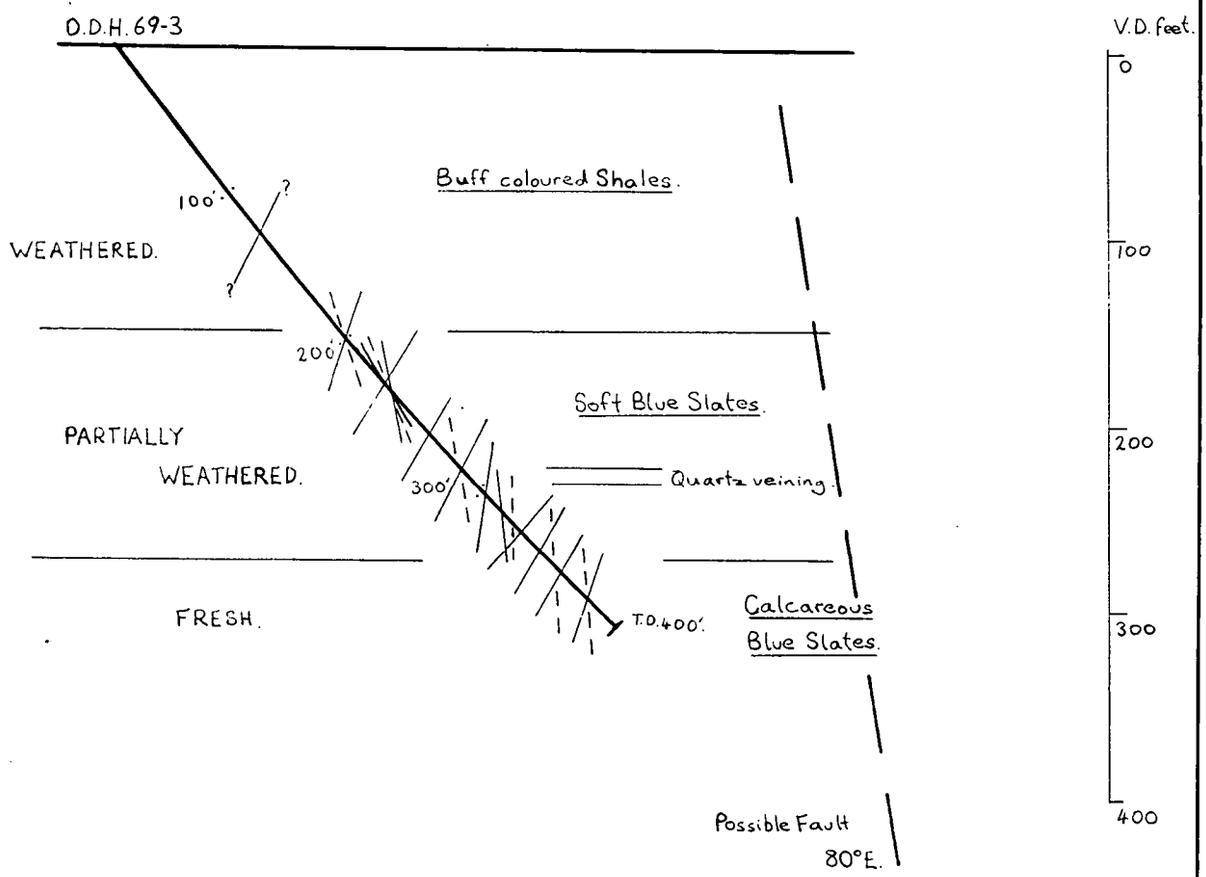

No acid bottle or Tropari Surveys due to loss of rods down hole. Dip of hole projected from general pattern of 63-9, 16N1E.

Projected depth was ~650'.
Target depth not tested.

KEY: 100' Depth of hole.
Dip of bedding.
Dip of cleavage.

SCALE: 1": 100'

GOLDEN DYKE FORMATION
THROUGHOUT

SECTION 69-3

ACACIA AREA.	SCALE 1 inch: 100 ft.
CO-ORDINATES 30N 00EW ACACIA GRID.	BEARING OF SECTION 90°T.

D53/87-530A

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: RUM JUNGLE DISTRICT. REMARKS:

HOLE No: 69-3 CO-ORDINATES: 30N 00EW. ACACIA GRID. R.L. GROUND:

LOCATION: ACACIA AREA. ANGLE FROM HORIZONTAL: 50° DIRECTION: E

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
NO CORE. RED/YELLOW SOILS.				NIL			
7'							
WEATHERED ROCK returned as buff and yellow mudstones, silts and shales. No bedding or cleavage apparent.		N		65			
23'							
NO CORE. Light red-brown muds returned.				NIL		Samples taken at: 75' 85' 95' 105' 115' 125'	
125'9"							
SOFT IRON-STAINED SHALES. Yellow and pale reds. Vague parting 20-35°				93			
133'9"							
NO CORE. Brown silts returned.				NIL		Samples taken at: 145' 155' 165' 175' 185' 195'	
196'							
BUFF COLOURED SHALES. Weathered.		B		90			

WEATHERED.

DRILL NO:

TYPE: MINDRILL WIRELINE

DRILLER: FARNOR

COMMENCED: 15/3/69

COMPLETED: 1/4/69

CASING IN HOLE DURING DRILLING

EXPLANATION

30 Bedding to core normal.
(65) Cleavage to core normal.
ss same sense
os opposite sense.

REFERENCES

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GD130 17/6/69

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT . . . . . RUM JUNGLE DISTRICT. . . . . REMARKS . . . . . .

HOLE No . . . . . 69:3. . . . . CO-ORDINATES . . 30N 00E W. . ACACIA GRID. . . . R.L. GROUND . . . . . .

LOCATION . . . . . ACACIA AREA. . . . . ANGLE FROM HORIZONTAL . . . . 50° . . DIRECTION E. . .

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
200							
BUFF SHALES. Streaked iron staining.			B.				
205'6"			30 (65) ss	90	WEATHERED		
PARTIALLY WEATHERED BLUE SLATES. Fine grained, with coarser darker carbonaceous bands < ½" common. Pyrite (weathered) and graphite appear at 210'; Pyrite (fresh) at 214'. Pyrite on bedding, graphite on cleavage faces.			35 (60) ss				
			10 (80-90)	80			
			<10 (75)	55			
Core broken from 211'-265'.			20 (70)				
			60 (60) os				
240' Carbonaceous bands < 1".			80-90 (70)				
246' Miniature faulting. Displacement of beds 1½". Plane of faults 60° to core normal.				15	PARTIALLY WEATHERED.		
			15				
			35				
			45				
268' Miniature faulting. Throw 2". Plane 60° to c.n. Carbonaceous bands < 3".			(60-65)				
275' Flexed ¼" carb. bands. Iron staining.			25	90			
276'			30				
277' CREAM SLATES. Carb. bands retain colour.			20 (45)				
278'6" MASSIVE QUARTZ VEIN: 16½".			25	25	WEATHERED		
281' GREY SLATE. Schillerized. Weathered pyrite.			30	100	FRESH.		
20" MASSIVE QUARTZ VEIN recovered. 1" vein weathered pyrite. Minor fresh pyrite.			40	100	WEATHERED		
294'			55				
				15	FRESH		
WEATHERED SLATES. Cream mudstones and Limonite-stained shales with weathered pyrite.							
300				25	WEATHERED		
305'							
Light brown silt returned. Darker (carbonaceous?) horizon.				14			
315'			(60)				
PARTIALLY WEATHERED BLUE SLATES.			10				
Very broken to 351'.							
Pyrite on cleavage.			0-10				
			(70)				
				30	PARTIALLY WEATHERED.		
340' Miniature faulting. ½" displacement. Carbonaceous bands < ½".			<20				
348' Fine pyrite and quartz streaked along cleavage.			10-20 (30) os?				
			10-15				
			40				
360'			15				
CALCAREOUS BLUE SLATES. Fresh. Darker in colour.			(30) os? (60) ss	91			
			15-25 (60)				
			30 (70)	2			
				NIL			Core scraped for Spectroscan.
Radiometric Log run to 384'. No major anomalies recorded						GOLDEN DYKE FORMATION THROUGHOUT.	No Tropari or Acid Bottle Surveys due to collapse of hole.
T.D. 400'.							
400							

DRILL NO . . . . . TYPE . . MINDRILL . WIRELINE . . CASING IN HOLE DURING DRILLING

DRILLER . . . FARNOR . . . . . COMMENCED . 15/3/69. . . . . COMPLETED . 1/4/69. . . . . GD130

EXPLANATION SS same sense; OS opposite sense. 30 Bedding to core normal.

REFERENCES (65) Cleavage to core normal. C.N. core normal.

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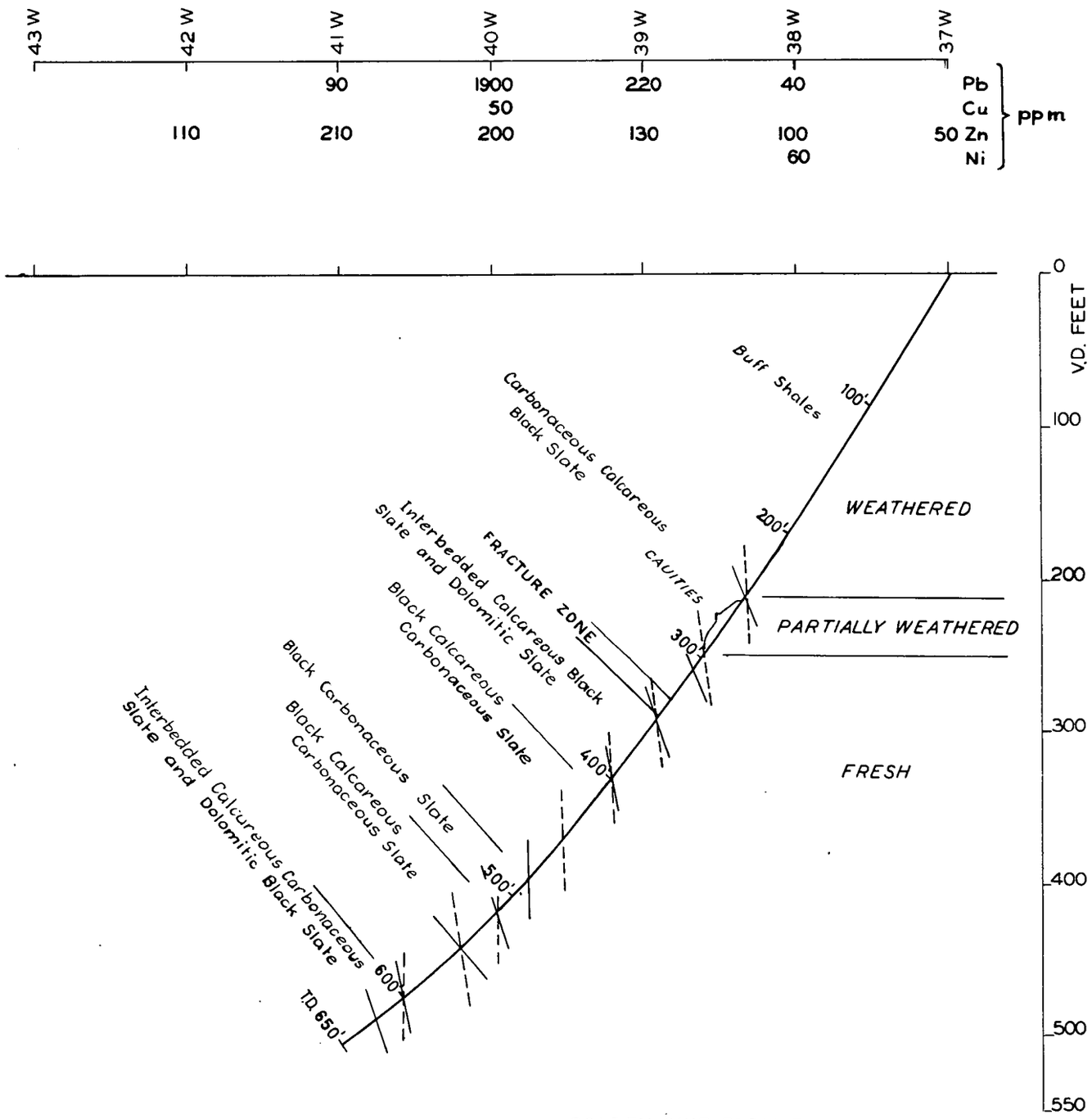
17/4/69.



GOLDEN DIKE FORMATION THROUGHOUT

D.D.H. 69-4A
COLLAR 256·5 S 37W – 60° GRID WEST
ACID BOTTLE SURVEY
200 – 58°
400 – 57°
620 – 37°

REFERENCE

100' DEPTH OF HOLE

DIP OF BEDDING

DIP OF CLEAVAGE

RUM JUNGLE DISTRICT N.T.
SECTION 256·5 S
RUM JUNGLE EAST GRID
D.D.H. 69-4A
AREA 44 EXTENDED

SCALE: 100 FEET TO 1 INCH

100' 50' 0 100' 200'

P.H.F.

D52/37-531A

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT RUM JUNGLE DISTRICT N.T. REMARKS DEPTH 650' 69-4 REDRILLED

HOLE No 69-4a CO-ORDINATES 256S 37W RUM JUNGLE EAST R.L. GROUND

LOCATION AREA 44 EXTENDED ANGLE FROM HORIZONTAL 60° DIRECTION W

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
0							
Core not requested				nil			
Soft completely weathered light brown/buff porous shales and muds					WEATHERED		
100							
200							

DRILL NO

TYPE MINDRILL WIRELINE

DRILLER FARNOR

COMMENCED 9-7-1969

COMPLETED 5-8-1969

EXPLANATION

CASING IN HOLE DURING DRILLING

1 inch = 20 feet

30° bedding to core normal

(50°) cleavage to core normal

ss same sense

os opposite sense

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SHEET 1 OF 4

DRAWING NO

GD130

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT RUM JUNGLE DISTRICT N.T. REMARKS DEPTH 650' 69-4 REDRILLED

HOLE No. 69-4a CO-ORDINATES 256 S 37 W RUM JUNGLE EAST R.L. GROUND

LOCATION AREA EXTENDED ANGLE FROM HORIZONTAL 60° DIRECTION W

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
200'							
core not requested		NQ		NIL		WEATHERED	
240' SOFT SHALE. Buff colour, soft and porous			35-40 (90)	64			
274' CARBONACEOUS SLATE soft porous calcareous in parts							
252' BUFF and BLACK SLATE porous, low recovery. Quartz fragments and 2" band of ironstone recoverd at about 256'. Soft mud returned from 260'-265'		BQ	35-40 25(55)	38 cav.		PARTLY WEATHERED	
279' CARBONACEOUS BLACK SLATE				35			
283' 284'6" SOLID BLACK SLATE 2° porous Ca bands			35-40 os (60) as	20			
CARBONACEOUS CALCAREOUS BLACK SLATE, some calcite veins < 1/8" fresh pyritic blebs occur below 293'			45(50)os 35(70)os	97			
300'			35(60)ss	55			
			35 (45-50)os				
326' A 6" band solid black carbonaceous slate, non calcareous			45(40)as				
			30(30os)				
334' 5" Crush zone 6" Calcite and graphitic slate and carbonaceous slate. Red iron staining		EQ	30(45)os				
338' FRACTURE ZONE. Extensive Calcite/Dolomite veining in crushed graphitic slate and calcareous slate. Red iron staining in frac.							
345' CALCAREOUS BLACK SLATE. Calcite veining < 1/8" Pyrite in calcite blebs			40-45	96		FRESH	
365' INTERBEDDED CALCAREOUS BLACK SLATE. AND DOLOMITIC SLATE. Calcite veining < 1/8". Pyrite in calcite blebs.							
380' CALCAREOUS BLACK SLATE. Graphitic on cleavage faces. Calcite veins < 2" and calcite blebs // bedding containing pyrite. Veining less common from 387'6" Pyrite blebs increase to < 1/2" in calcite blebs and bands // bedding			45(55)os			Graphite is more apparent in areas of extensive calcite veining.	
400'							

DRILL NO.

TYPE MINDRILL WIRELINE

DRILLER FARNOR

COMMENCED 9-7-1969

COMPLETED 5-8-1969

EXPLANATION

CASING IN HOLE DURING DRILLING

REFERENCES

35° bedding to core normal

(90°) cleavage to core normal

ss same sense

os opposite sense

// parallel

cav. cavity

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SHEET 2 OF 4

DRAWING NO.

GD130

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT RUM JUNGLE DISTRICT N.T. REMARKS 650' 69-4 REDRILLED

HOLE No 69-4a CO-ORDINATES 256 S 37 W RUM JUNGLE EAST R.L. GROUND

LOCATION AREA 44 EXTENDED ANGLE FROM HORIZONTAL 60° DIRECTION W

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
400'							
402' CALCAREOUS SLATE INTERBEDDED DOLOMITIC BLACK SLATE AND CALCAREOUS CARBONACEOUS SLATE Calcite veins less common: < 2" with associated pyrite in calcite blebs. Graphitic on cleavage faces.			45(70)os 45(50)os 50(20)os				
445' BLACK CALCAREOUS CARBONACEOUS SLATE. Numerous calcite blebs 1/10" - 2" with pyrite. Graphite and sometimes chlorite on cleavage.			45 45(40)os	98			
485' BLACK CARBONACEOUS SLATE Slightly calcareous. Calcite veining with pyrite mainly in calcite blebs.			40 20-25				
500'				75			
535' BLACK CALCAREOUS CARBONACEOUS SLATE. Carbon content low.			10-20 (45)ss 5-15				
542' Clear compositional banding from 542'. Calcite rich bands			0-10 (40)	97			
565' INTERBEDDED BLACK SLATE AND CALCAREOUS SLATE.							
575' BLACK CALCAREOUS CARBONACEOUS SLATE.							
581' Broken band 5". Pyrite and possibly chalcopyrite ≈ 5%			10-40 20-40 (40)				
595' INTERBEDDED CALCAREOUS CARBONACEOUS SLATE AND DOLOMITIC BLACK SLATE.							
600							

DRILL NO

TYPE MINDRILL WIRELINE

DRILLER FARNOR

COMMENCED 9-7-1969

COMPLETED 5-8-1969

EXPLANATION

CASING IN HOLE DURING DRILLING

1 Inch = 20 Feet

REFERENCES

45° bedding to core normal

(70) cleavage to core normal

ss same sense

os opposite sense

HEAD OFFICE

LOGGED BY R.S.N.

DRAWN BY P.H.F.

CHECKED BY

SHEET 3 OF 4

DRAWING NO

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT RUM JUNGLE DISTRICT N.T. REMARKS 650' 69-4 REDRILLED

HOLE No 69-4a CO-ORDINATES 256 S 37 W RUM JUNGLE EAST R.L. GROUND

LOCATION AREA 44 EXTENDED ANGLE FROM HORIZONTAL 60° DIRECTION W

DESCRIPTION OF CORE	R.L. CASING	DEPTH SIZE OF CORE	LOG	LIFT & CORE RECOVERY %	SAMPLES	REMARKS	ASSAYS
600' INTERBEDDED CALCAREOUS CARBONACEOUS SLATE AND DOLOMITIC BLACK SLATE. Calcite veining more common from 599' to 614'. Fractured from 611' to 613' Calcite blebs with pyrite common. Calcite veining rare from 614'			10-30 10-25 10-20 30 20	98			
650' Total depth 650'						Radiometric logs and S.P. and Resistivity logs run to 650' Acid Bottle Survey at: 200' corrected 58° 400' " 57° 620' " 37° Core scraped for spectroscan	
GOLDEN DYKE FORMATION THROUGHOUT							
700'							

DRILL NO.

TYPE MINDRILL WIRELINE

DRILLER FARNOR

COMMENCED 9-7-1969

COMPLETED 5-8-1969

EXPLANATION

CASING IN HOLE DURING DRILLING

1 Inch = 20 Feet

REFERENCES

10° bedding to core normal

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SHEET 4 OF 4

DRAWING NO.

GD130