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PRELIMINARY REPORT ON COMPILATION OF GEOLOGICAL GEOCHEMICAL AND RADIOMETRIC DATA FROM THE CENTRAL PORTION OF THE HUNDRED OF GOYDER, NORTHERN TERRITORY

by

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Note: The author of this preliminary report is no longer an officer of the Bureau of Mineral Resources. He resigned before completing the report and we cannot locate originals of plates 6i, 10b, 10c, 10o, 10p, 10r. Plates 19, 21, 22, which are not listed, were with the manuscript and have been included. No plate 18 exists as far as can be ascertained.

The report is being issued as it stands because it is felt that it contains much useful information which should be made available to others working in the area.

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INTRODUCTION

During 1966 and 1967, a compilation was undertaken of all the available geological geochemical and subsurface radiometric data resulting from exploration and mining activities by Territory Enterprises Pty. Limited, the Bureau of Mineral Resources and the Australian Mining and Smelting Co. Limited, carried out in the central portion of the Hundred of Goyder, Rum Jungle area, Northern Territory.

The area covered by this compilation extends from the vicinity of Mount Fitch to south of Castlemaine Hill and comprises 17 map sheets on a scale 400 feet to 1 inch. Another six sheets which contain very little information are not included with this preliminary report.

A full evaluation of data, and their correlation with geophysical results, still remains to be done, but this preliminary report has been prepared to draw attention to areas in which further work is required and to make the results obtained to date available in a convenient form to other organizations concerned with exploration of this area..

METHOD OF COMPILATION

The Rum Jungle compilation was based on a series of maps established by B.M.R. geologists carrying out the phosphate investigations during 1962 - 1964 (see Fig.1.). The series are based on T.E.P. Ltd mine grid and consist of 1:4800 map sheets each representing an area of 8000 x 1200 feet. Blocks of one hundred 1:4800 sheets have been given a letter symbol (e.g. E.) and each 1:4800 sheet of the block has been numbered (e.g. E-63). The bottom left hand corner of block E has been placed at the origin of T.E.P. Ltd. mine grid.

A near-surface geological map was compiled for each of the 17 - 1:4800 sheets showing the positions of the local grids, diamond drill holes and costeans. Additional sheets were also prepared showing sub-surface radioactivity and distribution of copper, lead, zinc, cobalt, nickel, molybdenum and vanadium anomalies. Composite sheets showing the geology and the main geochemical and subsurface anomalies have been prepared for this report together with notes on preliminary assessments and recommendations.

SOURCES OF COMPILED DATA

The information used in this compilation has accumulated since 1950 from prospecting and mining operations in the central portion of Hundred of Goyder by Territory Enterprises Pty. Limited, Bureau of Mineral Resources and the Australian Mining and Smelting Co. Limited. Compiled data was derived from:

(a) surface mapping by B.M.R. and T.E.P. Ltd geologists:

(b) auger drilling and subsurface radiometric and geochemical surveys by B.M.R. and T.E.P. Ltd.

(c) diamond and percussion drill core logs recorded by T.E.P. Ltd, A.M.& S. and B.M.R.

(d) plans and sections of open cuts and prospects prepared by T.E.P. Ltd., A.M.& S., and B.M.R.

The area was examined in field during the compilation and additional mapping and geochemical sampling was carried out where required.

NOTES ON COMPILATION OF 1:4800 SHEETS WITH PRELIMINARY ASSESSMENT AND RECOMMENDATIONS FOR FURTHER EXPLORATION

NOTES ON COMPILATION OF E31 and E32, RUM JUNGLE, NORTHERN TERRITORY

(Plates 1 and 2)

HISTORY OF EXPLORATION

1. Airborne surveys by B.M.R. and T.E.P. Limited detected radiometric anomalies in Mount Fitch North area (Daly, 1957, Livingstone, 1959, Wood and McCarthy, 1952).

2. In 1954 T.E.P. Limited carried out a regional costeaning programme, followed by waggon, rotary and churn drilling.

3. In 1961 B.M.R. carried out surface radiometric and electromagnetic surveys (Douglas, 1962).

4. In 1962 T.E.P. Limited drilled seven diamond drill holes in the area (Spratt, 1962).

5. One diamond drill hole was drilled by T.E.P. Limited in 1963 (Spratt, 1963).

6. In 1963 B.M.R. Carried out an auger drilling survey (Pritchard and French, 1963).

7. In 1965 T.E.P. Limited re-drilled part of the 1963 B.M.R. survey area enclosed by 48900N - 51700N, 10500E-11100E (Mount Fitch No.1 local grid).

8. In 1966 seven diamond drill holes were drilled by T.E.P. Limited to test the geochemical and radiometric anomalies outlined by the 1965 T.E.P.Ltd. survey.

9. In 1966 T.E.P. Limited carried out surface mapping and small scale auger drilling west of Mount Fitch North area (Marjoribanks, 1967).

GEOLOGY

Most of the exploration has been carried out along the Coomalie Dolomite - Golden Dyke Formation contact between 49000N - 55000N (Mount Fitch No.1 local grid). The stratigraphic sequence as derived from diamond drill holes, auger drilling surveys and surface mapping in the area appears to be as follows:

Golden Dyke Formation	4.	sericitic slate
	3.	black sericitic slate silicified black slate.
	2.	quartz sandstone, quartzite, silicified black slate
	1.	black slate, chloritic slate.
Coomalie Dolomite		tremolitic dolomite, silicified dolomite, chert.
Geostons Formation		arkosic schist, arkosic conglomerate
		_____ unconformity
Rum Jungle Complex		granite, gneiss.

The dolomite-slate contact strikes northerly and appears to dip west at about 30°. However, the dip of the schistosity in the slates ranges from 10° - 90°. Berkman (1966) has noted that "a number of fault zones, probably striking north-south, have been identified in the drillholes".

Crossbedded arkose and quartzite of the Beestons Formation underlie the Coomalie Dolomite to the east and overlie the granite of the Rum Jungle Complex.

SURFACE RADIOMETRIC ANOMALIES

The 1963 B.M.R. auger drilling survey (Pritchard and French, 1965) outlined several radiometric anomalies in Coomalie Dolomite and two radiometric anomalies in Golden Dyke Formation near its contact with the Coomalie Dolomite. In their report, Pritchard and French indicated that 0.015 radiometric units are equivalent to 0.044 mR/Hr.

Six auger drill holes were drilled in August 1967 to check two of the anomalies and a Harwell type ratemeter No.60 was used to probe the holes for radioactivity. The ratemeter was calibrated to read in mR/Hr and was checked in a test hole before and after the drilling carried out in the area. Variations in the calibration of the instrument were negligible.

Anomalies were drilled as follows:

(a) A radiometric anomaly of .015 units (.044"mR/Hr") was outlined by the 1963 B.M.R. survey in the Golden Dyke Formation at one-foot depth. The anomaly is elongated along 11000E between 50200N and 51600N (Mount Fitch No.1 local grid). A similar anomaly of .012 units was also outlined in weathered rock in the same locality. Three auger drill holes were drilled to check this anomaly.

Mount Fitch No.1 local grid		Maximum Value in weathered rock.	
		1967	1963
50800N	11000E	.018 mR/Hr	.015 units
50800N	10800E	.015 "	.015 "
51200N	11000E	.020 "	.020 "

The radiometric readings obtained in 1963 and 1967 compare reasonably well. However, it is unlikely that the .015 units of the 1963 B.M.R. survey are equivalent to .044 mR/Hr.

(b) The 1963 B.M.R. survey outlined a radiometric anomaly around 52200N 13200E (Mount Fitch No.1 local grid). Three auger drill holes were drilled to check this anomaly.

Mount Fitch No.1 local grid		Maximum Values in weathered rock.	
		1967	1963
52000N	13200E	.010 mR/Hr	.007 units
52000N	13400E	.011 "	.008 "
52200N	13200E	.014 "	.013 "

Again the 1963 and 1967 radiometric values appear to be comparable. Three diamond drill holes were drilled in the vicinity of the radiometric anomaly at 51200N 10800E, but no uranium mineralization was recorded. Another two diamond drill holes were drilled near an anomaly at 53600N 11400E, but only trace uranium mineralization was encountered in one of the holes (DD590, 79' - 82'; 0.21 lbs. U_3O_8/ton).

It seems therefore, that the radiometric anomalies outlined by the 1963 B.M.R. survey are of low intensity and do not warrant any further testing for uranium mineralization.

GEOCHEMICAL ANOMALIES

Two geochemical anomalies of moderate to high intensity occur within the area covered by E31. The anomalies are summarized below:

	Locality (Mount Fitch No.1) local grid			
I.	49400N	10860E	-	5000 ppm.Cu, 700 ppm. Ni.
	49600N	11000E	-	1500 ppm.Pb,
	49000N	10400E	-	3000 ppm.Pb.
II.	51200N	10800E	-	5000 ppm.Pb.

T.E.P. Limited re-drilled the area enclosed by 48900N - 51700N, 10500E - 11100E (Mount Fitch No.1 local grid) and relocated copper and lead mineralization in the same general area as those obtained from the 1963 B.M.R. survey. The maximum copper and lead values from the T.E.P. Limited survey were lower and cobalt and nickel values were higher than those obtained from the B.M.R. survey.

Anomaly II coincides with a radiometric anomaly which was mentioned in a previous section in this report, has been drilled by three diamond drill holes without recording any mineralization.

Anomaly I has not been drilled and some further testing in this area may be warranted. T.E.P. Limited have drilled seven diamond drill holes north of this anomaly, but only minor base metal mineralisation has been intersected by these holes (DD854 - trace galena at 158'; DD855 - 229'6" - 233'8", 4'2" x 1.2% Cu). Berkman (1966) has stated that further diamond drilling is proposed by T.E.P. Limited south of the existing diamond drill holes possibly near anomaly 1.

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NOTES ON COMPILATION OF SHEETS E41 (Plate 3a), and E42 (Plate 4).

HISTORY OF EXPLORATION.

In 1950, B.M.R. geologists investigated the geology in Mount Fitch Prospect area and found secondary uranium mineralization in dolomite near an old copper prospecting shaft (Tamblyn's Shaft). The uranium mineralisation was tested by costeans, two shallow shafts and three diamond drill holes. (Ward 1953).

2. In 1953 T.E.P. Ltd extended exploration activities westwards over the Golden Dyke Formation. Four diamond drill holes and many rotary, churn and waggon drill holes were drilled. Costeaning and stripping of the overburden were carried out to provide geological information regarding ore distribution. (Thomas, 1956, 1958).

3. In 1954 B.M.R. made a geophysical survey over the Mount Fitch Prospect (self potential and electromagnetic). (Langron, 1956).

4. The 1958 B.M.R. geochemical sampling survey covered the Mount Fitch Prospect area (Haldane and Debnam, 1959).

5. In 1961 T.E.P. Ltd made an assessment of uranium mineralization at Mount Fitch Prospect. (Mellor, 1961).

6. In 1963 B.M.R. - carried out -

(a) an auger drilling subsurface radiometric and geochemical survey which included the Mount Fitch Prospect area and (Pritchard & French, 1965) -

(B) drilled ten diamond drill holes and nine rotary drill holes to test the copper mineralization in dolomite at Mount Fitch Prospect (Pritchard and French, 1965).

(c) carried out electromagnetic, magnetic and surface radiometric surveys over the Golden Dyke Formation - Coomalie Dolomite contact. (Ashley, 1965).

7. In 1963 two minor investigations were carried out in the area:

(a) Williams (1963) examined the structural environment at Mount Fitch Prospect for T.E.P. Ltd.

(b) Rhodes (1965) investigated the metasediment - granite relationships in the area.

8. In 1964 B.M.R. drilled one diamond drill hole to test a geochemical anomaly but did not reach the target area. (Prichard, 1964).

9. In 1965 T.E.P. Ltd auger drilled the Golden Dyke Formation in the south eastern part of the area covered by E41.

10. In 1966 T.E.P. Ltd carried out reconnaissance geological mapping and surface radiometric survey over the western part of E41 sheet area. (Marjoribanks 1967).

11. T.E.P.Ltd are currently engaged in testing uranium mineralization at Mount Fitch Prospect (Berkman, 1966).

GEOLOGY

Six Lower Proterozoic formations, all striking north-west to north, occur in the area covered by E41 and E42. From west to east that include the Burrell Creek Formation, Golden Dyke Formation and the Coomalie Dolomite. The Acacia Gap Tongue underlies the Golden Dyke Formation south of Mount Fitch Prospect. Underlying the Coomalie Dolomite and in contact with the Rum Jungle Complex to the east are the Crater Formation south of 44400N (Mine Grid) and the Deeston's Formation in the north.

Tan coloured slates at 44000N 10500E (Mine grid) were included in the Burrell Creek Formation by Mellor (1961), but are tentatively placed in the Golden Dyke Formation in the compilation of E41.

A generalised sequence is shown in the stratigraphic table.

	ferruginous breccia (ferricrete, laterite)
BURRELL CREEK FORMATION	quartz, sericite and chlorite slate, greywacke
GOLDEN DYKE FORMATION	sericite slate, schist; black slate, schist; chlorite slate, schist; cherty carbonaceous schist.
ACACIA GAP TONGUE	pyritic quartzite, quartzite, black slate, sericite slate.
COOMALIE DOLOMITE	dolomite, chloritic dolomite, tremolite schist.
CRATER FORMATION	quartzite, arkosic quartzite, "hematite boulder conglomerate".
DEESTON'S FORMATION	crossbedded arkose and quartzite, conglomerate.
UNCONFORMITY	
RUM JUNGLE COMPLEX	sheared granite, granite gneiss

RADIOMETRIC ANOMALIES

The B.M.R. auger drilling survey in 1963 outlined several subsurface radiometric anomalies overlying Coomalie Dolomite and Golden Dyke Formation in the vicinity of Mount Fitch Prospect. In this report the peak values of these radiometric anomalies are grouped into three sub-areas where they are associated with geochemical anomalies (Geochemical anomalies I, II and III.)

	MOUNT FITCH No.1 Local grid		radiometric units
I.	44200N	11400E	0.120
	44200N	11600E	0.120
	43800N	11350E	0.100
	43800N	11550E	0.090
	43100N	12000E	0.080
	42900N	11900E	0.075
	42600N	12000E	0.065
	42500N	11950E	0.060
II.	44300N	11000E	0.048
	44200N	10800E	0.048
III.	47000N	11600E	0.040
	46800N	11400E	0.040

An isolated spot value of 0.160 radiometric units was recorded at 45200N 11600E. Two small surface radiometric anomalies were also recorded near this locality by the geophysical branch of the B.M.R. (Ashley, 1965).

GEOCHEMICAL ANOMALIES

The 1963 B.M.R. auger drilling survey also outlined a number of geochemical anomalies in Mount Fitch Prospect area, some of which were first located by the 1958 B.M.R. geochemical survey.

A large copper anomaly (Anomaly I) trends roughly north-south and overlies the Coomalie Dolomite between 42400N and 44800N (Mount Fitch No.1 local grid). Maximum values of +5000 ppm. Cu occur at both ends of this anomaly.

West of the slate-dolomite contact and Anomaly 1, a smaller copper anomaly (Anomaly II) occurs within the Golden Dyke Formation. A third copper anomaly (Anomaly III) occurs over the Coomalie Dolomite, some 2000 feet north of Anomaly I.

Smaller cobalt, nickel and vanadium anomalies are associated with all three of the copper anomalies. Lead is conspicuously absent from these geochemical anomalies but small anomalies of lead occur south-west of Anomaly I (1500 ppm. Pb at 42200N, 11800E; 1000 ppm. Pb at 42800N, 10600E).

ANOMALY I

Mount Fitch No.1 local grid		Cu pppm.	Co ppm.	Ni ppm.
44800N	11600E	5000	500	-
44600N	11700E	5000	-	-
44500N	11600E	5000	-	-
44400N	11600E	5000	-	-
44200N	11450E	-	-	1000
44300N	11450E	5000	-	-
44200N	11600E	-	800	-
44200N	11450E	5000	-	-
44100N	11500E	5000	-	-
44100N	11700E	5000	-	-
43800N	11500E	-	700	-
43800N	11600E	-	-	500
43500N	11700E	-	2000	-
43200N	11400E	-	1000	
42800N	11900E	5000	-	2000
42800N	11700E	-	-	1000
42700N	12200E	5000	-	-
42600N	12050E	-	2000	-
42700N	12250E	5000	-	-
42500N	12200E	5000	1000	-
42500N	12050E	-	1000	1000

ANOMALY II

44600N	10800E	2000	500	-
44000N	10400E	1000	-	-
43000N	10400E	-	500	-
43600N	10800E	1000	-	-
43200N	10800E	700	-	-
43000N	10800E	700	-	-

ANOMALY III

47000N	11400E	1000	500	-
47000N	11200E	-	-	500
46800N	11400E	1000	500	-
46200N	10600E	1000	-	-
46200N	11000E	1000	-	-

MINERALIZATION

The uranium mineralization at Mount Fitch Prospect has been discussed by Mellor (1961) and is currently being tested by T.E.P.Ltd. In 1963 B.M.R. carried out further drilling and evaluation of the adjacent copper mineralization south-west of the Mount Fitch uranium prospect (Pritchard and French. 1965). Only a brief summary of the B.M.R. work is given here.

The main geochemical anomaly (Anomaly I) has been drilled throughout its length and uranium and supergene copper mineralization have been encountered at the northern end of this anomaly. Pritchard and French (1965) stated that inferred reserves of 100,000 tons of 2% Cu may be present in this part of the anomaly. The best intersections of copper and uranium mineralization as recorded by Pritchard and French are:

R142	0 - 65'	65' x 2.9% Cu
DG22	14 - 50'	36' x 0.9% Cu
	55 - 63'	8' x 1.2% Cu
	63 - 65'	2' x 1.8 lbs. U_3O_8/ton
	68 - 80'	12' x 1.4 lbs. " "
	109'6 -113'	3'6 x 2.3% Cu

Further assays carried out by T.E.P: Ltd on core from DG23 revealed a total of 45 feet of 1-2 lbs. U_3O_8/ton.

High radioactivity has also been recorded between 167 - 173' in DG36. If this section has not already been checked for mineralization, radiometric assaying over this part of the core is recommended.

Gossanous outcrops occur further south near the centre of Anomaly I, and the highest grade of copper mineralization was recorded in diamond drill hole DG.27 (122'6" - 128'6"). Low grade supergene copper mineralization was also recorded in the southern part of the main geochemical anomaly.

Sporadic copper mineralization extends down-dip from the geochemical anomaly and was intersected in diamond drill holes as follows.

D.G.28	251' - 255'	4' x 1.9% Cu
	353' - 356'	3' x 3.3% Cu
D.G.30	590' - 600'	10' x 1.1% Cu
D.G.31	655' - 660'	5' x 4.2% Cu

Some of the copper mineralization within the dolomite appears to occur in the vicinity of the Coomalie Dolomite - Crater Formation contact. It is further noted that slight increases in radioactivity occur in the underlying Beestons Formation (DG22 Plate 3c) and in the Crater Formation (DG26 Plate 3b).

The early T.E.P. Ltd drilling and costeaning in vicinity of anomaly II revealed sporadic uranium and copper mineralization. More detailed assessment of this area is required and further drilling may be recommended.

Geochemical anomaly III and the associated subsurface radiometric anomalies have not been tested. Deeper auger drilling is recommended.

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NOTES ON COMPILATION OF SHEETS E51 and E61

(Plates 5, 8).

HISTORY OF EXPLORATION

1. In 1964 B.M.R. made:

   (a) a reconnaissance auger drilling subsurface radiometric and geochemical survey in the eastern part of E61 area and in south-eastern part of E51 area. (Dodson and Shatwell, 1965).

   (b) carried out surface radiometric, magnetic and electromagnetic survey over the same area. (Ashley, 1966).

2. In 1965 T.E.P. Limited made an auger drilling subsurface radiometric and geochemical survey over the north-eastern part of the area covered by E51 (part of Mount Fitch No.1 local grid).

3. In 1966 T.E.P. Limited made another auger drilling subsurface radiometric and geochemical survey over the south-eastern part of the area covered by E61 (Finniss - Anabranch local grid, - Berkman, 1966).

4. In 1966 T.E.P. Limited also carried out surface mapping and made a reconnaissance surface radiometric survey west of 9000E (mine grid): - (Marjoribanks, 1967).

GEOLOGY

Most of the area covered by the two sheets is occupied by the Golden Dyke Formation, and its contact with the overlying Burrell Creek Formation trends northerly.

Apart from vein quartz, outcrops are scarce in the area, and subsurface information from auger holes at the time of compilation was only available from the eastern part of the area covered by the two sheets. The predominant rock types encountered here have been described as sericite slate, quartz-sericite slate, and amphibolite.

No detailed structural information was available, but the regional dip of the sequence is probably westerly.

SUBSURFACE RADIOMETRIC AND GEOCHEMICAL DATA

E51

No significant geochemical anomalies were encountered in the area covered by this sheet. The maximum geochemical values obtained from the B.M.R. and T.E.P. Ltd surveys in the area to the end of 1966 were: -

Locality (approximate mine grid).		
33800N	11200E	60 ppm Cu
35800N	11280E	200 ppm Pb
33400N	12000E	250 ppm Zn
37000N	10200E	60 ppm Co
39300N	11550E	200 ppm Ni
37000N	10000E	12 ppm Mo

Maximum radiometric values to the end of 1966, were -

33400N	10800E	0.036 mR/Hr
34200N	11200E	0.036 mR/Hr

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A cluster of small geochemical anomalies occur in the south-eastern corner of the area covered by the sheet. The anomalies occur in the vicinity of a black slate band trending north-easterly. Maximum geochemical values from the 1964 B.M.R. and the 1966 T.E.P. Ltd. surveys are as follows:

Locality (mine grid)		
24200N	10000E	400 ppm. Cu
25200N	4400E	1740 ppm. Pb
25000N	11800E	250 ppm.Ni
28200N	10400E	200 ppm. Co
24200N	10200E & 10600E	60 ppm. Mo
30600N	11800E	800 ppm. Zn.

The 1964 B.M.R. auger drilling survey encountered anomalous radioactivity in a number of holes in which the radiometric values were increasing with the depth of the hole. However, the maximum depth probed in some of these holes was only 2 feet.

A radiometric anomaly was outlined by the 1964 B.M.R. survey along traverse 27400N between 10000E and 13000E. Maximum value reached was 0.055 mR/Hr at 27800N 10800E (mine grid). However, the 1966 TEP Ltd., Finnis - Anabranch survey did not confirm any anomalous radioactivity in this particular area. Furthermore, in September, 1967, the radiometric background at the surface was checked along traverses 27400N and 27800N between 10000E and 13000E, and anomalous radioactivity was not encountered.

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NOTES ON COMPILATION OF SHEET E52

RUM JUNGLE, N.T.

(Plate 6)

History of Exploration

1. Airborne radiometric and aeromagnetic surveys were carried out in the area by B.M.R. and T.E.P. Ltd as follows:

   (a) In 1951 - B.M.R. airborne scintillometer survey (Wood and McCarthy 1952)

   (b) In 1956 - T.E.P. Ltd low level airborne scintillometer survey.

   (c) In 1957 - B.M.R. airborne scintillometer and aeromagnetic survey (Livingstone 1959, Daly 1957)

2. During 1954-1955, T.E.P. Ltd carried out a regional costeaning programme along the dolomite-slate contact and discovered uranium mineralization south of Mt. Burton. The overburden was stripped and some of the ore was excavated. Later diamond and churn drilling were undertaken to define the orebody in depth.

3. During October-November 1958 uranium and copper ore at Mt. Burton was mined.

4. In 1958 B.M.R. carried out a shallow sampling geochemical survey along the dolomite-slate contact and outlined copper and lead anomalies north of Mount Burton open cut. (Haldane and Debnam 1959)

5. T.E.P. Ltd drilled 7 diamond drill holes and 3 churn drill holes during the period 1958-1959 to test the geochemical anomalies outlined by the 1958 B.M.R. survey.

6. In 1963 B.M.R. made an auger drilling geochemical and subsurface radiometric survey along the Dolerite Ridge Extended and Mount Fitch No.2 local grids - both north of Mount Burton open cut. (Pritchard and French 1965)

7. In 1963 B.M.R. carried out an electromagnetic, radiometric and magnetic survey along the Dolerite Ridge Extended, Mt Fitch No. 1 and Mt Fitch No. 2 local grids. (Ashley 1965)

8. In 1963 Williams (1963) examined the structure at Mt. Burton open cut and Rhodes (1965) investigated the sediment - granite relationship in the Rum Jungle Area.

9. In 1964 B.M.R. carried out auger drilling geochemical, subsurface radiometric and geophysical surveys along the Triangle grid which touches the Western margin of E52 sheet area. (Dodson and Shatwell 1965, Ashley 1966.)

10. In 1964 B.M.R. drilled four diamond drill holes in the area covered by E52 to test anomalies outlined by the 1963 geophysical survey. (Prichard 1964).

11. In 1965 T.E.P. Ltd auger drilled and carried out geochemical and subsurface radiometric surveys over parts of Dolerite Ridge Extended and Mount Fitch No. 1 local grids.

12. In 1967 compilation of the 1963 B.M.R. geochemical and subsurface radiometric surveys redefined the copper, lead and radiometric anomalies.

13. In 1967 T.E.P. Ltd made a shallow geochemical check survey and commenced diamond drilling to test the anomalies outlined in the B.M.R. compilation. (see 12, above)

14. In August 1967, nine auger drill holes were drilled to check the radiometric anomalies.

Geology

The Archaean granite and gneiss basement occurs in the north-eastern half of the area covered by E52, and four Lower Proterozoic formations, all striking north-westerly, occur in the south-western half of the sheet. These are from east to west: TheCrater Formation, Coomalie Dolomite, Acacia Gap Tongue, and Golden Dyke Formation. North of Mount Burton open cut the Acacia Gap Tongue is enclosed within the Golden Dyke Formation and generally is not in direct contact with the Coomalie Dolomite. The contacts between the various formations, including the basement, and offset by north-east trending faults.

The stratigraphy in the area is considered to be as follows:

Post-Lower Proterozoic	ferruginised sediments, ferricrete, ferruginous breccia, laterite
GOLDEN DYKE FORMATION	black slate, amphibolite, sericitic slate
ACACIA GAP TONGUE	quartzite, pyritic quartzite, black slate, sericite schist and slate.
GOLDEN DYKE FORMATION	amphibolite, black slate.
COOMALIE DOLOMITE	2. tremolite schist, tremolite chlorite schist, talc schist, dolomite, minor chert, amphibolite (?)
	1. dolomite, chloritic dolomite, talc schist, calcareous shale, kaolinitic schist, residual brown soil.
CRATER FORMATION	arkose, "hematitic boulder conglomerate", quartz-mica schist.

----------unconformity----------

RUM JUNGLE COMPLEX	quartz-feldspar mica schist (sheared granite), granite, gneiss.

Near the granite-sediment contact there are quartz-feldspar-mica schist outcrops, some of which appear to grade into granite. These rock types have been described by Pritchard and French (1965) and Williams (1963) as being a sheared granite, but on the B.M.R. Rum Jungle special map, appear to be included with the Crater Formation. It is possible that these rocks represent part of the Lower Proterozoic weathering profile of the granites.

Further field mapping in the area in 1966 revealed a small body of iron-rich sediments in direct contact with granite at 21900 E 33750 N (Mine Grid) These sediments are similar to the hematitic boulder conglomerate of the Crater Formation. However, the contact appears to be intrusive rather than an unconformity and these sediments may be Archaean in age.

Williams (1963) examined the structure at Mount Burton open cut and concluded that probably three phases of folding had taken place as follows:

(a) The axes of the oldest folding (F_1) plunge west-south-west at approximately 40° and produced a foliation trending north-north west.

(b) Minor folding with horizontal axes trending north-north-west.

(c) A third fold generation (F_3) with fold axes plunging at about 45° south-west.

It has been noted that while north of 37000N (Mine Grid) the Acacia Cap quartzite ridge is generally less than 400 feet in width, at 35500N there are two quartzite ridges and the combined width exceeds 1200 feet.

The main rock type in the outcrop is massive quartzite which appears to dip south-west at about 80°. Arcuate trends of quartzite outcrops were encountered at 36200 N 13800 E with arcs open to the south. However no reliable dips or lineations could be found to confirm possible isoclinal folding.

Subsurface Radiometric Anomalies

The 1963 B.M.R. auger drill survey outlined several radiometric anomalies overlying the Coomalie Dolomite and the Golden Dyke Formation at Burton Creek Prospect. The maximum radiometric values within some of these anomalies were above .072 units ranging up to .125 units (10600 N 13400 W Dolerite Ridge Ext. local grid).

In August 1967 nine auger drill holes were drilled in the area to check the northern four of the 1963 B.M.R. anomalies at the following localities.

TABLE 1.

Mount Fitch No. 2 local grid		Maximum values in weathered rock	
		1967	1963
36075 N	14800 E	.009 mR/Hr	not drilled
36075 N	15000 E	.031 "	.085 units
36075 N	15400 E	.019 "	.085 "
36075 N	15600 E	.017 "	.040 "
36075 N	15800 E	.010 "	.075 "
35475 N	15800 E	.010 "	.080 "
35275 N	15600 E	.010 "	.090 "
35275 N	16000 E	.009 "	.080 "
35275 N	16200 E	.012 "	.080 "

Anomalous radioactivity was only encountered in one auger hole (36075 N 15000E). The readings in the hole increased steadily from .011 mR/Hr at the surface to a maximum of .031 mR/Hr at the maximum depth of 26 feet. It is probable that the maximum radioactivity was not reached in this hole and deeper drilling around this locality is recommended.

Apart from this auger hole in the Golden Dyke Formation, the remainder of the holes drilled in August 1967 into the Coomalie Dolomite did not support the high readings recorded in the 1963 B.M.R. survey.

A surface radiometric survey was also made by the B.M.R. in 1963 (Ashley 1965). This survey outlined a small area of anomalous radioactivity at 10800 N 13800 W (Dolerite Ridge Ext. local grid) with a maximum value of about .025 mR/Hr. A check surface radiometric survey in September 1967 confirmed a low radioactive anomaly in the same area with a maximum value of about .020 mR/Hr. However, no significant surface radioactivity was encountered above the 1963 subsurface anomalies further north.

It is probable that subsurface radiometric anomalies may be associated with the geochemical anomalies in the area. The surface radioactivity outlined in 1963 and 1967 occur close to the maximum subsurface value of .125 units at 10600 N 13400 W. However, the location of any such subsurface anomalies could not be reliably deduced from the 1963 B.M.R. subsurface radiometric data.

In order to establish any sub-surface radiometric anomalies, it is recommended that the area enclosed within 34275 N/36075N, 15000E/16500E should be auger drilled on a 200'x200' grid. Blast hole drilling may be required in the western part of this area, due to quartzite outcrops. Excluding the localities already drilled, the anticipated total number of holes required is 52.

Two churn drill holes (C310,C311) have been drilled near the dolomite-slate contact west of the surface anomaly mentioned previously. No uranium mineralization above 0.2lbs U_3O_8/ton was recorded in either of these holes.

Further south, about 200 feet north of Mount Burton open cut, uranium mineralization was intersected in two T.E.P. Ltd drill holes (Plate 6)

DD 345 158'-197'; 39' x 1.5lbs U_3O_8/ ton.
CD 298 145'-175'; 30' x 0.57lbs U_3O_8/ ton.

Another hole about 1400 feet north-west of the open cut also intersected low grade uranium mineralization. (Plate 6).

DD 350 497'-500.5'; 3.5' x 0.7 lbs U_3O_8/ ton

Although it is conceivable that uranium mineralization has been missed, none of the other drill holes between DD 345 and DD 350 encountered any significant radioactivity.

Uranium and copper mineralization is known to extend below the floor of Mount Burton open cut. However, most of this mineralization is of low grade and does not seem to extend beyond 250 feet below the original surface level.

At the south-eastern edge of Mount Burton open cut uranium and copper mineralization were intersected in a T.E.P. Ltd churn drill hole.

CD 295 45' - 95' ; 50' x 5.64% Cu
130' -180' ; 50' x 1.21lbs U_3O_8 / ton
205' -220' ; 15' x 0.55lbs U_3O_8/ ton.

The only other hole intersecting mineralization was

CD 290 60' - 65'; 5' x 0.60% Cu.

Geochemical Anomalies

The 1963 B.M.R. auger drilling survey also outlined intense copper and lead anomalies along the dolomite-slate contact north of Mount Burton open cut. The 400 ppm contours of lead and of copper extend from about 35200N to 36200N (T.E.P.Ltd mine grid) and in the northern part of the anomalies these contours are not closed off to the west. The peak geochemical values for both copper and lead are concentrated in two small areas (anomalies 1 and 2). Less intense anomalies of nickel, cobalt and vanadium are also associated in both areas.

A third, much smaller geochemical anomaly occurs further east in dolomite (anomaly 3)

TABLE II

Anomaly 1 / Co-ordinates (Mt Fitch No 2 local grid)		
		Cu. ppm
15500E	34875N	5000
15600E	34875N	5000
		Pb. ppm
15600E	34875N	5000
		Co. ppm
15500E	35075N	200
15500E	34875N	200
15600E	34875N	200
15700E	34875N	200
		Ni. ppm
15500E	35075N	1000

Anomaly 2.

Co-ordinates (Dolerite Ridge Extended local grid)		
		Cu. ppm
14000W	10600N	5000
13900W	10600N	5000
		Pb. ppm
13800W	10600N	5000
		Co. ppm
13700W	10600N	200
13800W	10600N	200
13900W	10600N	200
14100W	10600N	200
		Ni. ppm
13900W	10600N	700
13800W	10600N	700
		V. ppm
13900W	10600N	500

Anomaly 3.

(Mt Fitch No 2 local grid)

13300E 35275N 1000 ppm Cu, 3000 ppm Pb, 1000 ppm Ni, 700 ppm Co.

In September 1967 some 28 mattock samples were collected west of the existing geochemical anomalies between traverses 34875N and 36075N (Mount Fitch No 1 local grid). The samples were analysed for Cu,Pb,Zn,Ni and Co using atomic absorption spectrograph method. The results are outlined in Table 111.

TABLE 111

Sample No	Locality Mt Fitch No 1 local grid.	Cu	Pb	Zn	Ni	Co	(in ppm)
7123051	36075N 14200E	35	25	18	12	25	
52	36075N 14400E	35	30	20	15	35	
53	36075N 14320E	40	40	30	20	40	
54	36075N 14600E	40	30	45	30	80	
55	36875N 14800E	40	45	35	18	40	
56	35875N 14200E	40	20	20	15	25	
57	35875N 14400E	25	30	40	18	40	
58	35875N 14550E	20	40	20	15	35	
59	35875N 14600E	35	35	20	25	50	
60	35875N 14800E	40	50	15	15	25	
61	35775N 14400E	20	25	18	12	30	
62	35675N 14600E	15	20	10	8	15	
63	35675N 14800E	25	45	25	18	35	
64	35675N 15000E	65	190	30	20	35	
65	35475N 14600E	15	15	12	10	15	
66	35475N 14800E	25	35	25	15	25	
67	35475N 15000E	60	160	30	18	20	
68	35275N 14600E	15	20	20	12	15	
69	35275N 14800E	30	20	20	15	20	
70	35275N 15000E	30	40	25	15	30	
71	35075N 14600E	15	10	8	8	10	
72	35075N 14800E	15	10	30	8	20	
7123073	35075N 15000E	15	40	15	10	15	
74	35075N 15200E	110	1000	40	20	35	
75	34875N 14800E	24	20	50	12	30	
76	34875N 15000E	20	45	40	12	25	
77	34875N 15200E	60	570	45	18	35	
7123078	34875N 15400E	390	2500	100	90	85	

It is evident from the geochemical values of the mattock samples that the geochemical anomalies do not extend on to the quartzite ridge to the west. Anomalous copper and lead values were only encountered on traverses 34875N and 35075N, east of 15000E. However, the mineralized sequence may extend down dip to the west under the quartzite ridge. It is recommended that any such extension should be tested by waggon drilling the area within 15000 E - 15600E, 34275N - 34875N to at least a depth of 100 feet.

Two bottom-hole samples taken from the 1967 auger drill holes in the northern part of the geochemical anomalies were also submitted for geochemical analyses. The results of these determinations are listed below.

Sample No.	Locality Mount Fitch No 1 local grid	Cu	Pb	Zn	Ni	Co
		(in ppm)				
67123007	36075N 15000E	270	100	550	90	200
67123009	36075N 15400E	1380	100	450	440	390

In March 1967, T.E.P. Ltd were notified of the high copper and lead values obtained in the 1963 B.M.R. survey. The company set out to check these values and collected 21 shallow depth hand auger samples from the area covered by geochemical anomalies 1 and 2. These samples were analysed by atomic absorption spectrograph method and the results obtained tend to confirm and exceed the copper and lead values obtained by the B.M.R. (1963) survey. The T.E.P. Ltd results have been listed in Table IV

TABLE IV

T.E.P. Ltd analyses of hand auger samples (Analyses by Atomic Absorption Spectrograph).

Co-ordinates (Mount Fitch No 2 local grid)	Cu.ppm	Pb.ppm
15200E 35075N	600	900
15400E 35075N	1000	700
15500E 35075N	2700	4700
15500E 34875N	4000	5200
15600E 34875N	3500	20600
(Dolerite Ridge Ext) local grid		
14100W 10800N	200	500
14000W 10800N	200	2100
13900W 10800N	100	2600
13800W 10800N	600	2000
13700W 10800N	1000	3300
14100W 10600N	400	100
14000W 10600N	500	1200
13900W 10600N	200	1500
13800W 10600N	400	2900
13700W 10600N	200	800
14200W 10400N	5000	2600
14000W 10400N	400	900
13800W 10400N	500	900
14000W 10200N	200	400
13800W 10200N	200	900
13800W 10200N	50	200

T.E.P. Ltd also analysed drill cuttings from this area for copper and lead. The results obtained were generally anomalous, although no ore grade mineralization was encountered. The highest values obtained are as follows.

CD 310	55' - 775';	22.5' x 1.12% Pb
CD 180	25' - 30';	5' x 1.55% Cu

A list of the complete results of the T.E.P. Ltd analyses from these and other holes are provided in table V.

TABLE V.

ASSAYS BY ATOMIC ABSORPTION SPECTROGRAPH METHOD DONE BY T.E.P.L. MARCH 1967

...um drill samples

C.D. 180	Cu %	Pb%
0-5'	0.23	0.19
5-10'	0.27	0.15
10-15'	0.34	0.22
15-20	0.35	0.13
20-25	0.48	0.07
25-30	1.55	0.13
30-35	0.57	0.11
36-40	0.63	0.11
40-45	0.56	0.09
45-50	sample missing	
50-55	0.11	TR
55-60	0.07	TR
60-65	0.04	TR
65-70	0.03	TR
70-75	0.01	TR
75-80	0.03	TR
80-85	TR	TR
85-90	sample missing	
90-95	TR	TR
95-100	0.01	TR
100-105	0.01	TR
105-110	0.02	TR
110-115	0.01	TR
115-120	0.01	TR
120-125	TR	TR
125-130	TR	TR

TR = < 0.01%

C.D. 181		
0-5	.01	.01
10		
15	.01	.03
20	.01	.02
25	.02	.02
30	.11	.16
35	.07	.19
40	.13	.16

C.D. 181 (cont)	Cu %	Pb%
45	.15	.14
50	.04	.08
55	.07	.16
60	.08	.31
65	.11	.32
70	.17	.47
75	.18	.49
80	.12	.35

C.D. 310

0 - 2'6"	0.06	0.13
- 5'	0.04	0.08
7'6"	0.04	0.09
10'	0.05	0.16
12'6"	0.64	0.53
12'6"	0.12	0.15
15'	0.17	0.13
17'6"	0.23	0.18
20'	0.38	0.32
22'6"	0.46	0.31
25'	0.39	0.30
27'6"	0.27	0.27
30	0.17	0.24
32'6"	0.17	0.17
35	0.15	0.10
37'6"	0.25	0.20
40'	0.27	0.18
42'6"	0.25	0.20
45'	0.22	0.14
47'6"	0.24	0.16
50	0.24	0.15
52'6"	0.34	0.34
55'	Sample missing	
57'6"	0.67	1.60
60	0.63	2.25
62'6"	0.45	0.89
65'	0.48	0.70
67'6"	0.50	1.02
70'	0.54	0.92
72'6"	0.60	1.00
75'	0.50	0.90
77'6"	0.59	0.76
80'	0.67	0.37
82'6"	0.50	0.37

C.D. 310 (cont)

	Cu %	Pb%
85'	0.47	0.41
87'6"	0.60	0.21
90'	0.45	0.29
92'6"	0.49	0.55
95'	0.49	0.42

T.E.P. ASSAYS DONE IN 1955.

C.D. 179

	16./ton U_3O_8	% Cu	% Pb
0 - 5'	0.14	0.14	0.2
5 -10'	0.17	0.21	0.1
10-15'	0.24	0.25	
15 -20'	0.19	0.79	0.1
20 -25'	0.1	0.57	0.1
25 -30'	0.12	0.47	0.1

C.D. 298

125-130'	0.11
130-135'	0.11
135-140'	0.06
140-145'	0.20
145-150'	0.53
150-155'	0.43
155-160'	0.66
160-165'	0.66
165-170'	0.41
170-175'	0.74

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NOTES ON COMPILATION OF E62 RUM JUNGLE NORTHERN TERRITORY

(Plate 9.)

HISTORY OF EXPLORATION

1. The prospects at Dolerite Ridge and West Finniss areas were indicated by (a) the 1951 B.M.R. high level airborne survey (Wood and McCarthy, 1952);

(b) the 1956 T.E.P.Ltd. low level airborne survey (Spratt, 1962),

(c) the 1957 B.M.R. low level airborne survey (Livingstone, 1959).

2. Prior to 1960, T.E.P. Ltd. investigated the slate-dolomite contact between Browns Prospect and Mount Burton with regional costeaning and some limited churn drilling.

3. In 1958, B.M.R. covered parts of the area with shallow depth geochemical sampling (Haldane and Debnam, 1959).

4. During the period 1960 - 1964, T.E.P. Ltd. drilled six diamond drill holes at West Finniss prospect and some 27 diamond drill holes in the Dolerite Ridge - Dolerite Ridge East areas. (Spratt, 1962, 1963).

5. In 1963 - 1964 T.E.P. Ltd. drilled nine diamond drill holes in the northern section of the slate-dolomite contact and five diamond drill holes in the southern section of the slate-dolomite contact between Mount Burton Open Cut and Browns' Prospect. (Spratt, 1964).

6. In 1961 and 1962 deeper geochemical sampling and subsurface radiometric surveys were carried out by B.M.R. in the West Finniss and Dolerite Ridge areas. (Runton and Shields, 1963a, b).

7. In 1962, Runton made a geochemical soil sampling survey in Rum Finniss area (Oldershaw, 1963).

8. In 1963, B.M.R. made a geochemical and subsurface radiometric auger drilling survey in Browns' S.W. and Dolerite Ridge East areas. (Yeaman and Pritchard, 1965).

9. In 1964 B.M.R. made -

(a) a reconnaissance auger drilling subsurface radiometric and geochemical survey in the western half of the sheet area. (Dodson and Shatwell, 1965).

(b) carried out surface radiometric, magnetic and electromagnetic surveys in the same area. (Ashley, 1966).

10. In 1964 B.M.R. drilled two diamond drill holes in the area to test electromagnetic and magnetic anomalies outlined in 9(b).

11. In 1965 T.E.P.Ltd carried out auger drilling in the extreme north-western part of the sheet area, north of the West Finniss prospect.

12. In 1966 T.E.P. Ltd did some additional auger drilling in the Finniss-Amlbranch area covering part of the 1964 B.M.R. auger drill survey in the south-western part of the sheet area. (Berkman, 1966).

GEOLOGY

Three formations, all striking north-west, occur in the area covered by E62. These are, from east to west, the Coomalie Dolomite, Acacia Gap Tongue and Golden Dyke Formation. A generalised stratigraphic sequence is as follows:

GOLDEN DYKE FORMATION	5.	sericitic slate, black slate, amphibolite
	4.	greywacke (?)
	3.	black slate
	2.	chloritic slate — dolerite
	1.	biotite-calcite slate, quartz-biotite schist, chlorite talc schist.
ACACIA GAP TONGUE		quartzite (pyritic), black slate
COOMALIE DOLOMITE		dolomite, tremolitic dolomite.

In the north-east corner of the sheet area a major shear zone trends north-easterly. South of this shear zone the Golden Dyke Formation and the Acacia Gap Tongue trend east and north-easterly. The Acacia Gap Tongue in this area occurs within the Golden Dyke Formation and apparently is not in direct contact with the Coomalie Dolomite.

The Dolerite within the Golden Dyke Formation is intrusive.

RADIOMETRIC ANOMALIES

It has been stated in the reports on the 1961 and 1963 B.M.R. surveys that the original radiometric readings recorded in the field, and which have been used for compilation, were too low (Ruxton and Shields, 1963; Yeaman and Pritchard, 1965). Ruxton and Shields have doubled their values and Yeaman and Pritchard have multiplied their results by a factor of 2.0 to 3.5 to give an equivalent value in mR/Hr.

The highest recorded radiometric readings obtained from the 1961 and 1963 B.M.R. surveys are as follows:

	Co-ordinates (Dolerite Ridge) local grid (1961 survey)	Recorded reading	"Corrected" reading
1.	00N 15400W	0.036	0.072 mR/Hr
	(Brown's S.W.) local grid (1963 survey)		
2.	1000S 13800W	0.031	0.062 mR/Hr
3	00S 14800W	0.028	0.052 mR/Hr

In August 1967 two auger holes were drilled in Brown's S.W. area to check on the 1963 radiometric values recorded in the field.

(Brown's S.W.) local grid	Maximum Value in weathered rock 1967	1963
00S 14800W	029 mR/Hr	.028 units
200S 14800W	020 mR/Hr	.025 units

The radiometric values obtained from the two holes in 1967 are comparable to the original values recorded in the field in 1963 at the same localities. On the evidence from these two holes it seems that there is no need to alter the original radiometric values recorded in 1963. More holes however, are required to confirm this.

The 1961 values were not checked.

The radiometric anomaly at 00N 15400W (Brown's S.W. local grid) was diamond drilled by T.E.P. Ltd (D551), but no uranium mineralization was encountered in this hole.

The highest radiometric readings recorded by the 1964 B.M.R. survey are as follows:

	Co-ordinates (T.E.P.Ltd. Mine Grid)		
1.	26200N	14600E	0.058 mR/Hr
2.	27400N	12800E	0.052 mR/Hr

Part of the area covered by the 1964 B.M.R. survey (23200N - 29200N, 9000E - 14600E; T.E.P. Ltd Mine grid) was redrilled by T.E.P.Ltd. in 1966. Only moderate radiometric anomalies were recorded by the T.E.P.Ltd. survey; some of these tend to coincide with the B.M.R. anomalies.

Of all the drill holes drilled within the area covered by the sheet, only one diamond drill hole has recorded uranium mineralization in excess of 0.5 lbs. U_3O_8/ton (DD 741 - 162' - 164'; 2' x 0.58 lbs U_3O_8/ton).

GEOCHEMICAL ANOMALIES

Only small geochemical anomalies of low and moderate intensity occur within the area covered by E62. The anomalies tend to occur in the following areas:

(a) along the southern part of the dolomite - slate contact from Browns S.W. to Mount Burton open cut;

(b) in the area around 24800N 21400E (mine grid) where the subsurface dolomite -slate contact may occur at shallow depth;

(c) in the area west of the Finniss River.

The anomalies are summarised below:

Anomaly 1. - Co-ordinates (Dolerite Ridge) local grid		25000N 21400E (mine grid)
400S	15400W	700 ppm Cu
300S	15300W	300 ppm Ni, 550 ppm. Zn.
(Browns S.W.) local grid		
200S	15200W	1500 ppm. Pb
400S	15400W	1500 ppm. Pb, 700 ppm. Cu.
Anomaly 2. - (Browns S.W.) local grid		25400N 22100E (mine grid)
400N	14400W	700 ppm. Cu, 500 ppm.Ni, 500 ppm.Co.
600N	14400W	700 ppm.Cu
00N	14600W	500 ppm.Ni
200S	14600W	500 ppm.Cu 500 ppm.Ni.

Anomaly 3 (Brown's S.W.) local grid	25300N	23200E (mine grid)		
200S 13800W			500 ppm. Ni	
200S 13400W			500 ppm. Cu	
Anomaly 4 (Brown's S.W.) local grid	24100N	22000E (mine grid)		
1200S 15400W			700 ppm. Cu	300 ppm. Ni.
Anomaly 5 (Rum Finniss) local grid	25600N	15600E (mine grid)		
3000N 20300W			700 ppm. Pb	
2600N 20300W			700 ppm. Pb.	
Anomaly 6 (Triangle and Finniss-Anabranch areas.) mine grid	24400N	14000E (mine grid)		
24600N 13800E				500 ppm.Zn
24400N 14000E		340 ppm.Cu.	800 ppm. Pb,	870 ppm.Zn
Anomaly 7 (Triangle and Finniss Anabranch areas) mine grid	24800N	12600E (mine grid)		
25000N 12600E			500 ppm.Pb.	
25000N 12400E			250 ppm.Cu	
24800N 12600E			540 ppm.Zn.	
Anomaly 8 (West Finniss) local grid	29600N	13400W (mine grid)		
8400N 18600W			520 ppm.Zn	
8200N 18600W			410 ppm.Cu	

Anomalies 1 and 3 have been drilled by T.E.P. Ltd (D552 and D781 respectively) without encountering any mineralization. However, vertical diamond drilling at 400S 15400W (Brown's S.W. local grid) is tentatively recommended to test the geochemical anomalies in the vicinity of the main shear zone.

Anomaly 5 was outlined during a localised shallow sample survey by Ruxton (1963). A weak copper anomaly was also originally outlined by the 1958 B.M.R. survey in the same area (Haldane and Debnam, 1959). However, two auger hole samples in the anomalous area, collected during the 1964 B.M.R. survey gave only low geochemical values.

In August 1967 a mattock sample was collected from each of the localities where Ruxton obtained anomalous lead values. Atomic absorption spectrograph analyses of these samples gave slightly anomalous lead values.

Sample No.	Rum Finniss local grid		Cu	Pb	Zn	Ni	Co
7123079	2600N	20300W	80	325	100	18	30
80	2800N	20300W	80	180	130	30	55
7123081	3000N	20300W	75	290	100	25	60

Two surface samples were also collected from a ferruginous outcrop at 25600N 15600E (mine grid) which has been shown as a "gossan" on some of the T.E.P. Ltd maps. No anomalous geochemical values were encountered.

Sample NO.	Dolerite Ridge local grid		Cu	Pb	Zn	Ni	Co
67123048	2000N	1600W	90	30	4	40	95
67123049	2180N	1500W	50	25	80	15	55

The small copper anomalies 2 and 4 have not been tested.

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Notes on Compilation of E53 (Plate 7), E63 (Plate 10a), E73 (Plate 13)

SUMMARY OF EXPLORATION HISTORY

Following the initial discovery of uranium minerals at Rum Jungle in late 1949, prospecting and mining operations were developed by the B.M.R. during the period 1950-1952.

At the end of 1952 an agreement to work the uranium deposits was arranged by the Commonwealth with Consolidated Zinc Proprietry Limited. A subsidiary company (Territory Enterprises Pty Ltd) was formed by Consolidated Zinc to carry out prospecting and mining activities at Rum Jungle and elsewhere in the Hundred of Goyder.

TEP Ltd took over the mining operations at Rum Jungle in January 1953 and by the end of 1958 the extraction of the uranium-copper-lead orebody at White's and the uranium orebody at Dyson's was completed (Thomas 1956, 1958).

Prospecting activities after 1958 by TEP Ltd, the Australian Mining and Smelting Company and the Bureau of Mineral Resources are briefly summarized as follows:

1. TEP Ltd continued diamond, churn and waggon drilling in the Embayment Area in search of uranium and basemetal mineralization.

2. In 1958 BMR made a shallow-depth geochemical sampling survey (Haldane and Debnam, 1959)

3. In 1963 the Australian Mining and Smelting Company commenced development of a copper orebody at Intermediate Prospect. The mining of this orebody was completed by October 1965 (Berkman, 1966a).

4. In 1963 BMR made a localised auger drilling geochemical and subsurface radiometric survey over the original copper orebody at Intermediate Prospect (Pritchard, 1964).

5. During the period 1962-64 BMR investigated phosphate mineralization in the Buckshee-Powerplant area, at White's East Prospect and near Dyson's open cut (Pritchard et al., 1963, 1966).

6. In 1963 BMR made an auger drilling subsurface radiometric and geochemical survey in Browns SW area enclosed within 00N-2000S, 11000W-16600W (Brown's SW local grid) (Yeaman and Pritchard, 1965).

7. In 1964 TEP Ltd.:
   (a) auger drilled the area south-east of the 1963 BMR Brown's survey to Giant's Reef Fault and south-west to the railway line.
   (b) made a reconnaissance auger drilling survey over the northern part of the Embayment Area (Spratt, 1964).

8. In 1966 TEP Ltd made a combined auger drilling and waggon drilling subsurface radiometric and geochemical survey over a small area north-east of Dyson's Open cut (Berkman, 1966b).

9. In 1966 the Australian Mining and Smelting Company Limited commenced a vertical shaft at Brown's Prospect to test the lead-copper mineralisation in depth.

The 400 foot : 1 inch sheets of E53, E63 and parts of E62 and E73 cover the "Embayment Area" which comparises a triangular area of folded and faulted metasediments elongated in a north-east direction. It is bounded by the Rum Jungle Complex along the Giant's Reef Fault Zone on the south-east side; by the Rum Jungle-Crater Formation unconformity along the northern side; and the North Australian Railway forms an arbitrary boundary of this area to the south-west.

GEOLOGY AND STRUCTURE

The embayment structure was interpreted by the early T.E.P. Ltd geologists as a complex synclinal structure, consisting of a number of subsidiary synclines and anticlines. It was thought that the structure had been deformed by dragfolding due to movements along the Giant's Reef Fault Zone (Thomas, 1956). Thomas (1958) further specified that dragfolding was the major tectonic feature in the eastern part of the embayment.

Later Williams (1963) rejected dragfolding as a major factor in the formation of the embayment, and suggested that the embayment structure was formed by refolding of originally north-south trending isoclinal folds and of the Rum Jungle Complex itself. He also suggested that the Giant's Reef Fault Zone may represent a climax of the deformation which produced the refolding in the Embayment Area.

Although refolding of the metasediments and the Rum Jungle Complex may have taken place to form the embayment, it appears that dragfolding did occur in the eastern part of the Embayment Area.

The stratigraphic sequence as encountered in the Embayment Area is as follows:

TERTIARY ?

ferruginised sediment, ferruginised breccia, laterite, ferricrete.

LOWER PROTEROZOIC	Golden Dyke Formation	Graphitic and carbonaceous slate, sericitic slate, talcose slate, chloritic slate, "augen" slate, chloritic and talcose mudstone, amphibolite.
	Masson Formation Acacia Gap Tongue	black pyritic slate, sericitic slate, pyritic quartzite.
	"Castlemaine Beds" (Pritchard et al, 1966)	hematitic quartz breccia, hematitic siltstone, hematitic sandstone, dolomite.
	Coomalie Dolomite	dolomitic limestone, dolomite, tremolitic dolomite.
	Crater Formation	quartzite, arkose, slate, "hematitic boulder conglomerate".
	UNCONFORMITY	
ARCHAEAN	Rum Jungle Complex	sheared granite, leucocratic granite, coarse granite, granite gneiss.

The structure in the south-eastern half of the Embayment Area consist of a complex synclinal wedge of tightly folded and disrupted slates, schist and amphibolites of the Golden Dyke Formation and pyritic quartzites and black slates of the Acacia Gap Tongue. The wedge tapers to the north-east and deepens to the south-west. The maximum depth of the Golden Dyke Formation within this wedge is probably attained between Brown's Prospect and the contact with the underlying Coomalie Dolomite, which forms the base of the wedge to south-west.

The slate-dolomite contact along the north-western margin of the wedge is often brecciated and a major shear zone, also trending north-east, occurs within the slate close to the contact. Most of the base metal and/or uranium mineralization encountered at White's East, White's, Intermediate, and Brown's prospects and open cuts occurs within the belt covering this north-western slate-dolomite contact and the main shear zone.

Pyritic quartzites and black slates of the Acacia Gap Tongue underlie the Golden Dyke Formation on the south-eastern side of the wedge. The Acacia Gap Tongue is in turn underlain by the Coomalie Dolomite to the south-east.

The Golden Dyke Formation forming the tip of the wedge in the area between White's East prospect and Dyson's Open cut has apparently been dragfolded southwards due to movements along the Giant's Reef Fault Zone. In this part of the area the Acacia Gap Tongue has broken away from the Golden Dyke Formation to form an arcuate subsidiary syncline around the tip of the wedge. Most of the early discoveries of uranium mineralization in this area were located on the north-western side of this subsidiary syncline which

also affects the "Castlemaine Beds" and the Coomalie Dolomite.

The north-western two-thirds of the Embayment area is occupied by the Coomalie Dolomite which encloses the "Castlemaine Beds" at Buckshee and Powerplant phosphate prospects.

The Crater Formation, at the base of the metasedimentary sequence in the Embayment Area, is confined to the northern edge of the embayment. Here it occurs in direct contact with a sheared granite (quartz-feldspar-mica schist).

(Plate 10a)

Surface and Subsurface Radiometric Surveys

No significant radiometric anomalies have been outlined outside the known areas of uranium mineralization in the Embayment area. A systematic surface radiometric survey carried out by T.E.P. Ltd about 1958 along the 1958 Geochemical baseline confirmed anomalous radioactivity at Dyson's White's East, White's and at a locality east of Brown's Prospect at 300N 7700W (1958 Geochemical local grid). All of these anomalies have been extensively drilled and the associated uranium orebodies at Dyson's and White's have been excavated.

Later auger drill surveys at Brown's South-West (BMR 1963, TEP Ltd 1964 surveys) and the Embayment North auger drill survey (TEP Ltd 1964) failed to encounter any significant radioactivity.

Another BMR auger drill survey at Buckshee at 31500N 26600E (Mine Grid) outlined two small radiometric anomalies associated with phosphate mineralization.

More recently in 1966 the T.E.P. Ltd carried out combined auger and waggon drilling north of Dyson's Open cut. Radiometric anomalies up to five times background were outlined along the western slate-dolomite contact. T.E.P. Ltd were in process of testing this anomaly with diamond drilling early in 1967.

GEOCHEMICAL ANOMALIES

Apart from the original copper mineralization at Intermediate open cut and the lead-copper mineralization at Brown's Prospect, no significant basemetal anomalies were detected by the geochemical surveys. The 1958 B.M.R. shallow sampling geochemical survey outlined an intense copper anomaly over the Intermediate and Brown's prospects and another intense Anomaly of lead over Brown's prospect. The south-western extension of the lead anomaly was closed off by the 1963 B.M.R. auger drill survey. A line of small disconnected nickel anomalies was

also outlined between 11200W 1800S and 12600W 2200S (1958 Geochemical local grid). The 1963 B.M.R. auger drilling survey outlined anomalies of copper, cobalt and nickel over the original Intermediate copper prospect, and the 1964 T.E.P. Ltd Embayment North auger drill survey encountered anomalous copper values at the southern end of traverse 26800E (approximate mine grid) in the vicinity of Brown's Prospect.

The anomalies are summarised below.

LEAD ANOMALIES

1958 B.M.R. Geochemical survey

1958 Geochemical local grid		
8000W	800N	4800 ppm
9600W	400N	4800 ppm
9600W	00N	3600 ppm

1963 B.M.R. Brown's S.W. survey

Brown's S.W. local grid		
11000W	200S	1500 ppm

1966 T.E.P. Ltd Dyson's North Survey

Dyson's North local grid		
316N	349E	620 ppm
327N	344E	2250 ppm (on E 53)

COPPER ANOMALIES

1958 B.M.R. Geochemical Survey

1958 Geochemical local grid		
8000W	400N	2200 ppm

1963 B.M.R. Intermediate Survey

Intermediate Local grid		
6200W	300N	5000 ppm
6200W	400N	5000 ppm
6300W	400N	5000 ppm
6300W	500N	5000 ppm

1964 T.E.P. Ltd Embayment North Survey

Approximate mine grid		
26800E	28400N	400 ppm
26800E	28800N	400 ppm

1966 T.E.P. Ltd Dyson's North survey

Dyson's North local grid		
313N	354E	374 ppm
314N	350E	344 ppm
315N	348E	359 ppm

COBALT AND NICKEL ANOMALIES

1958 Geochemical local grid		1958 B.M.R. Geochemical Survey
8800W	1200N	350 ppm Co
4800W	800N	400 ppm Ni

Brown's S.W. local grid		1963 B.M.R. & T.E.P. Ltd Brown's S.W. Survey
11600W	2200S	250 ppm Co
11200W	1800S	500 ppm Ni
12600W	2200S	400 ppm Ni
13000W	3400S	400 ppm Ni (on E 73)

Intermediate local grid		1963 B.M.R. Intermediate Survey
6300W	400N	2000 ppm Co
6200W	400N	500 ppm Ni
6300W	400N	
6300W	500N	

Approximate mine grid		1964 T.E.P. Ltd Embayment North Survey
28800N	26800E	1000 ppm Co, 600 ppm Ni

Four rock samples were collected from the Giant's Reef Fault zone at 28540N 32240E (mine grid) where the fault is exposed in an erosion channel. The samples were analysed for Cu, Pb, Zn, Co and Ni but no anomalous values were present. The results are tabulated below.

Sample No.	Cu	Pb	Zn	Co	Ni
66127001	10	25	15	<5	<5
66127002	10	10	12	5	<5
66127003	8	10	15	<5	15
66127004	50	12	75	20	30

All samples taken from the same locality (28540N/32240E mine grid)

No subsurface geochemical or radiometric surveys, have been carried out along the slate-dolomite contact on the south-eastern side of the Golden Dyke Formation between 7000W and 11000W (1958 Geochemical local grid). It is tentatively recomended that a reconnaissance auger drilling survey is made over this slate-dolomite contact to test for any subsurface radiometric or geochemical anomalies in the area. Some of the traverses should be extended to the metasediment - granite contact to test for any radioactivity in the Crater Formation.

URANIUM AND BASEMETAL MINERALIZATION

A longitudinal section (Plate 10b) showing the slate-dolomite contact was drawn along the 1960 geophysical baseline between 00 and 12000W. Between 00W - 3300 west, the plane of the section has been displaced 300 feet to the south-east to include areas of uranium mineralization at White's East prospect and Dyson's open cut. A longitudinal projection showing projected intersections of uranium, copper and lead mineralization in diamond drill holes was also prepared along the same planes (Plate 10c).

A gradational succession in the type of mineralization encountered at the various prospects in the embayment is evident from this longitudinal projection. Uranium mineralization predominates at Dyson's; grading into uranium, copper and lead at White's; copper and lead at the Intermediate; and lead and copper at Brown's. It is of interest to note that the same sequence is also repeated in cross section at Whites, where uranium mineralization is succeeded towards south-east by zones of copper and lead mineralization. This could suggest the possibility that the uranium, copper and lead mineralization represent three separate zones, which converge at White's open cut, but diverge vertically at both ends of the longitudinal projection.

The mineralization at some of the open cuts is discussed briefly in the following sections.

COPPER, LEAD AND URANIUM MINERALIZATION BETWEEN BROWN'S PROSPECT AND WHITE'S OPEN CUT

Copper and Lead mineralization is known to occur in depth between Brown's Prospect and White's Open Cut. The best intersections in diamond drill holes occur between 800-1000 feet below the surface (Plate 10e and f), but the grade appears to fall off up the dip of the slate-dolomite contact to the north-west. Closer to the surface, sporadic uranium mineralization is also evident at the slate dolomite contact and the maximum grade intersected has been recorded in D 143 (504.3' - 507.4'; 1.1' x 36.4 lbs U_3O_8/ton. - plate 10d).

In depth, the copper and lead mineralization persist along the strike of the structure to the south-west, but the grade of the mineralization is generally lower between the Intermediate open cut and Brown's Prospect.

Sporadic copper and some lead mineralization has also been recorded in some of the diamond drill holes to the north-east, where it occurs at 500-600 feet below the original surface at White's Open Cut (Plates 10j, 10k).

WHITE'S OPEN CUT

Sporadic uranium mineralization has been intersected in diamond drill holes below the floor of White's open cut. It occurs as small high grade patches within the Main Shear zone and two vertical holes (D's 322 and 323) intersected weak uranium mineralization south of the main shear zone (Plates 10j, 10k). Low grade uranium mineralization was also encountered in DD's 343 and DD 346, again south of the Main Shear zone.

Diamond drilling is recommended to test for uranium mineralization along the southern slate-dolomite contact between 3500W to 4500w, 00S to 100S, at a depth of 500 to 700 feet below the original surface level at White's Open Cut.

DYSON'S OPEN CUT

The original uranium mineralization near surface at Dyson's was located in puggy black slates dipping at 30°-40° to the east. The ore was localised along two faults (the Thrust Fault and the West Fault) and restricted to the area between those two faults. The ore and the two faults were thought to be terminated to the south-east by another fault (Main Fault) at a depth of 500-700 feet. The vertical displacement of the Main Fault is of the order of 600 feet with the south-east block thrown down (Thomas 1956).

Continuation of the uranium mineralization has not been established on the south eastern (downthrow) side of the Main Fault. However this has not been tested thoroghly in depth. It is possible that the slate-dolomite contact flattens north-west of the Main Fault which would not be detected by the deep vertical holes drilled within the calte (D181 Plate 10a, DD184 Plate 10f). Inclined diamond drill holes of the order of 1000 feet would be required to test slate dolomite contact at a depth of 800-900 feet below the Dyson's open cut.

On the longitudinal projection (Plate 10c) a shoot of uranium mineralization of sporadic grade occurs below Dyson's open cut and appears to plunge south-west. The mineralization in this area is localised along the slate-dolomite contact and appears to decrease in grade towards the Main Fault (Plate 10r), the most south-westerly intersection of this mineralization being recorded in DD 314 (Plate 10p). However, the slate-dolomite contact was not intersected in this hole. Further south-east, diamond drilling along the slate-hematitic quartzite breccia contact failed to intersect any uranium mineralization to a vertical depth of 440 feet (Plate 10o). However, the zone of mineralization, as projected along the longitudinal section (10e), would appear on the cross section (Plate 10o) some 700 feet below the surface. This projection is subject to the assumption that the uranium mineralization extends this far and that the plunge of the mineralized zone is constant. Diamond drilling of the order of 900 feet would be required to test the slate-dolomite contact for uranium mineralization underlying the hematitic quartzite breccia in the area between Dyson's open cut and White's East prospect.

E 53 (Plate 7)

Two auger drilling surveys occur within the area covered by E 53. These are:

(a) 1964 T.E.P. Ltd Embayment North auger drilling survey

Maximum geochemical values obtained from this survey are as follows:

300	ppm	Cu
300	ppm	Pb
400	ppm	Ni
80	ppm	Co
300	ppm	V
400	ppm	Zn
25	ppm	Mo

No significant radioactivity was encountered during this survey.

(b) 1966 T.E.P. Ltd Dyson's North auger drilling survey

A subsurface sample from dolomite at 327N/344E (Dyson's North local grid) showed 274 ppm Cu, 2250 ppm Pb, and 1430 ppm Zn.

Some further testing of this anomaly appears to be warranted.

E 73 (Plate 13)

The 1964 T.E.P. Ltd Brown's S.W. auger drilling survey covers a small area in the north-western part of the sheet area.

Geochemical assays of auger samples gave 400 ppm Ni at 13000W 3400S, and 250 ppm Ni at 12000W 3800S (Brown's S.W. local grid). No other anomalous geochemical values were obtained by the survey in this area.

Slight increases in radioactivity (about twice background) were recorded in dolomite near the Crater Formation at 11000W 3400S and 13000W 3800S.

No recommendations for further work can be made at this time.

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Notes on Compilation of Sheet E71

Rum Jungle, N.T.
(Plates 11a,11b)

History of Exploration

1. In 1962 auger drilling, geochemical and subsurface radiometric surveys were carried out at Area 55 West West by the B.M.R. (area centered at 22200 N. 11200 E, T.E.P. Ltd. mine grid) (Ruxton and Shields, 1963).

2. In 1964 T.E.P. Ltd. drilled 12 diamond drill holes in Area 55 West West (referred by T.E.P. as Area 55 West).

3. In 1964 B.M.R. carried out (a) a reconnaissance auger drilling, geochemical and subsurface radiometric survey in the eastern part of the sheet area, (Dodson and Shatwell, 1965) (b) electromagnetic, magnetic and surface radiometric surveys were carried out in the same area, (Ashley, 1966).

4. In 1965 T.E.P. Ltd. drilled six diamond drill holes in the south-eastern part of the sheet area to test geochemical anomalies found by the 1964 B.M.R. survey.

5. In 1966 T.E.P. Ltd auger drilled part of the area covered by the 1964 B.M.R. survey between the T.E.P. Ltd mine grid co-ordinates 16400 N - 20400 N and 9000 E - 11400 E (referred by T.E.P. Ltd as Triangle North Area) and checked the geochemical anomalies outlined by the 1964 B.M.R. survey.

6. In 1966 T.E.P. Ltd carried out surface mapping west of the 1964 B.M.R. survey (Majoribanks, 1967).

General

Exploration has been mainly concentrated on the Triangle North Area and Area 55 West West, both near the Golden Dyke Formation - Coomalie Dolomite contact. On this sheet, the slate - dolomite contact strikes northerly and dips to the west for most of its length; in the north the contact swings north-east and forms the western limb of the anticlinal structure on sheet E72.

The Burrell Creek Formation - Golden Dyke Formation contact lies approximately 6,500 feet to the west of the slate-dolomite contact, and strikes northerly.

Triangle North Area

The lithological succession deduced from diamond drill cores and auger cuttings is as follows:

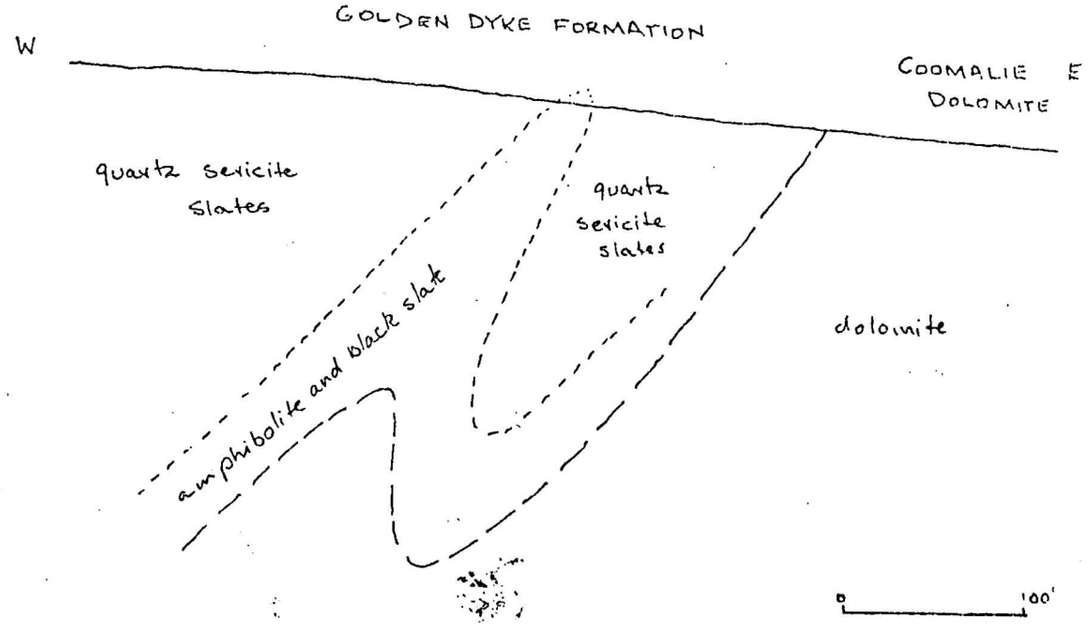
GOLDEN DYKE FORMATION	6. quartz sericite slate 5. amphibolite and black slate 4. quartz sericite slate 3. black pyritic slate, amphibolite, dolomitic sericite slate
COOMALIE DOLOMITE	2. biotitic dolomite 1. tremolitic dolomite, pyritic dolomite

Lithological units 5 and 6 are subject to the interpretation of the structure in the area. It is possible that the Golden Dyke Formation

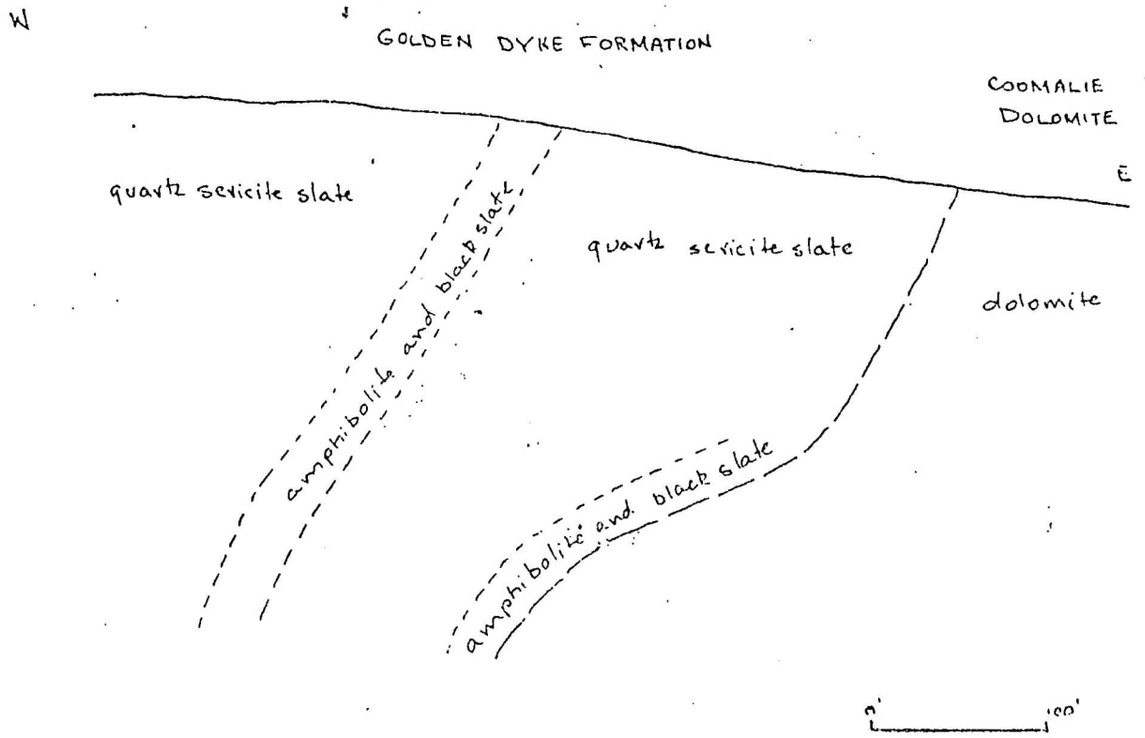
near the slate-dolomite contact has been isoclinally folded with the axial plane of the fold dipping to the west. If this interpretation is correct, it is possible that the amphibolites and the black slates encountered in the diamond drill holes near the base of the Golden Dyke Formation (unit 3) are stratigraphically equivalent to similar rock types found close to the surface, but further west of the slate-dolomite contact (unit 5).

Two possible interpretations of the structure are illustrated below.

1. Assuming Isoclinal Folding



2. Assuming all sequences dipping west



Subsurface Radiometric Anomalies

Five small radiometric anomalies were detected by the 1964 B.M.R. survey in soil and weathered rock overlying both the slate and dolomite. All of the anomalies are elongated north-south and occur in a zone trending west-north-west which crosses the slate-dolomite contact roughly at right angles.

The localities of the anomalies and the peak values are outlined below.

Locality		Peak Value (mR/hr)
18200 N	11600 E	.036
18600 N	11000 E	.081
18600 N	10400 E	.044
18600 N	10000 E to 19400 N - 9800E	.160 .046
18200 N	9400 E	.064

The 1966 T.E.P. Ltd survey outlined low radiometric anomalies in the same area with a more pronounced north-westerly trend. The maximum intensity was recorded at 18800 N 11000 E showing 371 counts per second. Other peak readings were at:

18000 N	10400 E	102 C/S
18000 N	9800 E	109 C/S
19200 N	10000 E	209 C/S
19600 N	9000 E	104 C/S
20000 N	9800 E	100 C/S

1000 C/S $\triangleq$ 1lb U_3O_8 / ton.

The T.E.P. Ltd survey did not record any anomalously high readings around the maximum reading of the B.M.R. survey at 18600 N 10000 E.

The anomalies at 18600 N, 10000 E and 18600 N, 11000 E were tested by DD816 and DD817 respectively. Only "small increases in radioactivity" were recorded in these diamond drill holes.

Geochemical Anomalies.

The area was first auger drilled by the B.M.R. in 1964 and the auger samples were analysed by optical emission spectrograph method by A.M.D.L. Later, B.M.R. carried out its own optical emission spectrograph analyses on 13 of the auger samples to check the A.M.D.L. values and obtained much lower results. The area was redrilled by T.E.P. Ltd. in 1966; this time the auger samples were analysed by atomic absorption spectrograph, and some of the original A.M.D.L. values from the 1964 B.M.R. survey were also checked. The check values were again invariably lower than the original A.M.D.L. values.

The 1966 T.E.P. Ltd auger drill survey re-established anomalies in the same general area as the B.M.R. survey. However, these anomalies are less extensive and the individual values are generally lower.

The two surveys outlined two main zones of geochemical anomalies in the area.

The largest of the two zones (Anomaly I) extends from 17600 N to 20000 N and occurs in Coomalie Dolomite near the slate dolomite contact. High copper, zinc, nickel and cobalt values predominate in this anomaly (see table showing Peak values).

Anomaly I — Overlies Coomalie Dolomite

Locality	Cu. ppm
17800 N 11000 E	1000 (1400) (BMR check 400 ppm)
18400 N 11000 E	(720)
18400 N 11400 E	(700)
19000 N 11400 E	1200 (BMR check 200 ppm)
	Ni. ppm
19800 N 11000 E	2000
17800 N 11000 E	5000 (BMR check 1500 ppm)

Locality	Pb. ppm
18400 N 10800 E	(350)
	Zn. ppm
19200 N 10800 E	(1420)
18400 N 10800 E	(3250)
17800 N 10800 E	3000
	Co. ppm
18200 N 11000 E	400
17800 N 10800 E	400

Anomaly II — Overlies Golden Dyke Formation

Locality	Cu. ppm
19200 N 10200 E	(490)
17600 N 10200 E	(490)
17000 N 10200 E	1000 (220)
16800 N 10000 E	(335)
	Ni. ppm
19800 N 10000 E	500
21400 N 10200 E	500
17400 N 10200 E	500
16600 N 10200 E	600

Locality	Pb. ppm
20000 N 10000 E	(540)
19200 N 10000 E	(780)
19000 N 19800 E	500
	Zn. ppm
16600 N 10200 E	6000
17400 N 10200 E	2000
19400 N 10200 E	(1000)
19800 N 10000 E	5000
21400 N 10200 E	6000
	Co. ppm
17400 N 10200 E	250

Anomaly III & IV — Overlies Coomalie Dolomite

III Locality	Cu. ppm
20400 N 12000 E	500
	Ni. ppm
20200 N 11800 E	2500
20600 N 11800 E	2500
	Co. ppm
20600 N 11800 E	250
	Zn. ppm
20200 N 11800 E	2000

IV Locality	Cu. ppm
16200 N 11200 E	1000
	Ni. ppm
16600 N 12000 E	2500
	Co. ppm
16600 N 12000 E	1000
	Zn. ppm
16200 N 11800 E	700

Note: T.E.P. auger sample analyses by atomic absorption spectrograph method in brackets.

However, diamond drilling has only revealed trace mineralization in DD 823 (Galena between 220'-222') and in DD 817 (0.2% Cu between 475'.5'-478').

The 1964 B.M.R. survey also outlined a narrow belt of copper, zinc, nickel, lead, and cobalt anomalies in the Golden Dyke Formation extending from 16000 N to 20400 N (Anomaly II). The 1966 T.E.P. Ltd survey shows a much less continuous zone in the same area. The existing diamond drill holes in this area do not adequately test the T.E.P. Ltd lead, copper, zinc

and radiometric anomaly centered at 19200 N 10000 E and an additional diamond drill hole is recommended. Peak values within the anomaly are:

Pb	780 ppm	19200 N 10000 E
Zn	1000 ppm	19600 N 10200 E
Cu	450 ppm	19200 N 10200 E
Radiometric	209 C/S	19200 N 10000 E

The proposed diamond drill hole should be collared at 19200 N 9700 E, depressed 55° due east to test the radiometric, lead and zinc anomaly at 200'-300' and the copper anomaly at 300'-350' below the surface. The length of the proposed hole is 400'.

The 1964 B.M.R. survey outlined two areas of anomalous values of Cu, Zn, Ni, and Co, around 20200 N 11800 E (Anomaly III) and around 16600 N 11600 E (Anomaly IV). Both anomalous areas occur in Coomalie Dolomite.

The 1966 T.E.P. Ltd survey also located a high lead value (520 ppm) at 16400 N 9000 E in sericite slates of the Golden Dyke Formation. This anomaly has not been closed off to the west, and some additional auger drill holes are recommended to test its extension to the west.

Area 55 West West

The probable sequence as derived from diamond drill cores and auger cuttings is outlined below.

GOLDEN DYKE FORMATION	6. sericitic slate 5. chloritic slate 4. black carbonaceous & graphitic slate, sericitic slate 3. calcite biotite slate, talc biotite slate, talc chlorite sericite schist and mylonite. 2. amphibolite, black slate
COOMALIE DOLOMITE	1. biotite dolomite, dolomite, talc dolomite, actinolitic limestone, minor black pyritic quartz biotite slate.

Thin sections of the amphibolite and sericite slate have been made for T.E.P. Ltd by A.M.D.L. From these thin sections the amphibolite in DD 712 was described as a quartz-plagioclase-hornblende hornfels and the quartz-sericite slate in DD 715 and DD 718 was described as a quartz-feldspar-biotite-muscovite schist.

The overall dip of the sequence appears to be north-westerly. However the structure is more complex due to local faulting and folding. Structure contours of the Golden Dyke Formation - Coomalie Dolomite contact suggest that the axes of the principal fold direction plunges north-north-west while a second generation of folds appear to trend east-north-east. No surface map of this area was available for compilation.

Subsurface Radiometric Anomalies

Two small radiometric anomalies occur in weathered rock near 253W 16N (1958 geochemical grid). The maximum reading recorded in the area is at 4.6 N 258 W (0.120 mR/hr at 68' depth).

No significant uranium mineralization was encountered in any of the diamond drill cores in the area. The only section assayed for uranium mineralization is from DD 711 (0.18 lbs U_3O_8 /ton between 105'-110')

Geochemical Anomalies

A chemical analysis of a composite sample from three small quartzose outcrops at 253W 16N gave 16.9% Pb and 4.22% P_2O_5 (samples submitted by Ruxton). Auger samples contained 3000 ppm Pb at 253 W 16 N, and 700 ppm Pb at 260 W 10 N. However, lead mineralization was only noted in two diamond drill holes in this area:

DD720 - 202'-214'; 12' x 1.9 Pb in quartz, black slate and green slate breccia.

DD717 - 190'-216'; trace pb noted by HNO_3 - KI test.

In spite of these disappointing results, costeaning of the surface lead-rich zones is recommended to establish the full extent and grade of the occurrence.

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Notes on Compilation of Sheet E72

Rum Jungle, N.T.
(Plate 12a)

History of Exploration

1. Radiometric anomalies were located in the area by the 1951 B.M.R. high level airborne radiometric and aeromagnetic survey, (Wood and McCarthy 1952). Areas 55 and 55 West were detected by this survey.

2. T.E.P. Ltd tested Area 55 by 2 costeans, 2 diamond drill holes and 8 churn drill holes.

3. A T.E.P. Ltd. low level airborne survey in 1956 relocated Area 55 West.

4. B.M.R. 1957 low level airborne survey picked up radiometric anomalies at Area 55 and north-east of Area 55A. (Livingstone 1959).

5. Shallow geochemical sampling by B.M.R. in 1958 (Haldane and Debnam 1959), located copper anomalies at Areas 55, 55B, 55 West; lead anomalies at Areas 55, 55B, 55 West; nickel at Areas 55, and 55 West.

6. In 1959-1960, A.M. & S drilled 4 diamond drill holes and costeaned Area 55.

7. Geophysical surveys were carried out by B.M.R. in 1960 and 1962 (Douglas, 1962,1963).

8. Deeper geochemical sampling was carried out by B.M.R. in 1961 and 1962 by auger drilling (Ruxton and Shields, 1963a,b).
These surveys confirmed the anomalies found in 1958 geochemical survey.

9. In 1963 induced polarisation test surveys were undertaken by B.M.R. (Eadie,1963).

10. In 1962-1965 T.E.P. Ltd. diamond drilled Areas 55, and 55 West, but not 55 B.

11. In 1963 Pritchard and Yeaman examined the area from Browns S.W. to south-west of Area 55. (B.M.R. Record 1964/150 and 1965/113).

12. In 1964 B.M.R. carried out a reconnaissance geochemical survey over adjoining areas (Dodson and Shatwell, 1965); and an electromagnetic, magnetic and surface radiometric survey (Ashley, 1966).

13. In 1965 R.N. Spratt (T.E.P.Ltd geologist) made an assessment of the copper-lead mineralization at Area 55.

General Geology.

A faulted synclinal structure west of Area 55 and an anticline at Area 55 West form the major features in the area. Structure contours of the Golden Dyke Formation - Coomalie Dolomite contact suggest that the axial plane of the syncline trends north-easterly; the plunge is not known. Lineations observed by Yeaman and Pritchard at Area 55 plunge in a north-westerly direction at approximately 40°-60°. It is not known whether the movement along the Giant's Reef Fault zone played any part in the development of the structure.

Different geological successions along the dolomite - slate contact have been established, at the various prospects, these have been briefly summarised below.

AREA 55

This prospect has been dealt with in some detail by P.W. Pritchard (1964). A generalised sequence is as follows:

GOLDEN DYKE FORMATION	sericitic slates carbonaceous slates talcose greenschist (includes talcose sericite schist, talcose and biotite chlorite schist, various dolomitic biotite talc schists and slates)
COOMALIE DOLOMITE	tremolitic quartzites tremolitic schists and dolomites micaceous rocks.

The prospect appears to occupy the eastern limb of a faulted synclinal structure. It is not known whether this "syncline" is in part an original sedimentary structure or a wholly tectonic one. Near the base of this structure, (i.e. towards S.W.), the greenschist lenses out, but reappears further north-west in the same stratigraphic position.

Radiometric Anomalies

Radiometric anomalies are located at

(1) 4s/10w to 6s/12w: radiometric anomaly in weathered rock; maximum reading is 0.132 mR/Hr at 5s/11w and is approximately equivalent to 1.7lbs U_3O_8 /ton.

(2) 8S/8W to 10S/12W: maximum at 10S/12W - 0.084 mR/Hr.

The anomalies have been tested by a number of diamond and churn drill holes. Only "slight" increases in radioactivity have been recorded. No further exploration can be recommended at this stage of compilation.

South-west of Area 55, three small radiometric anomalies are centred at

(3) 26S/8W:- 0.036 - 0.072 mR/Hr.

(4) 28S/2W:- 0.036 - 0.048 mR/Hr.

(5) 32S/10W:-0.036 - 0.084 mR/Hr.

(only radiometric contours available, maximum values could not be found.)

Drilling in this area has revealed uranium mineralization in excess of 0.5lbs U_3O_8 / ton in six holes. The highest values are:-

DD713 - 21bs U_3O_8 / ton at 172'
DD727 - 59'-77'; 18' x 1.9lbs U_3O_8/ ton.

Further north-east T.E.P.Ltd found 4' x 3.5 lbs U_3O_8 /ton, between 168'-172' in DD714 (16S/9W). Yeamon (1965) states that a leached limonite-malachite outcrop at 16.7S/8W is in line with the intersection of mineralization in DD714 projected parallel to the lineation. A small radiometric anomaly at 18S/8W may also be associated with this intersection in the drill hole.

Geochemical Anomalies

The most intense of the copper and lead anomalies are located around 6S/8W where values of +5000 ppm for both metals were obtained. The 400 ppm lead contour is confined to the northern part of the area, but the 400 ppm copper contour extends south-west along the slate-dolomite contact to 26S.

Associated with the copper and lead anomalies are a cluster of cobalt, nickel, vanadium and molybdenum anomalies which continue south-west beyond the copper anomaly to 32S, and extend north-east to Area 55B.

Diamond and churn drilling has outlined a zone of lead-copper mineralization, about 400 by 200 feet in horizontal extent, which partly underlies the intense lead anomaly but is offset to the north-west of the peak of the copper anomaly.

Several of these holes have encountered high base metal values including:-

		Cu%	Pb%	
DDA 4	41' - 91';	50' x 0.6	6.9	Analyses
	142' - 157';	15' x 2.6	0.5	by B.M.R.
DD 818	75' - 120';	45' x 1.6	9.5	Analyses
	120' - 150';	30' x 0.5	17.8	by
	150' - 185';	35' x 1.1	5.8	T.E.P.Ltd.
DD 811	170' - 213';	43' x 1.5	22.8	Analyses
	223' - 233';	10' x 0.6	5.0	by
	248' - 273';	25' x 1.3	7.2	T.E.P.Ltd.
DD 819	85' - 105';	20' x 0.9	11.1	Analyses
	305' - 320';	15' x 6.1	0.1	by T.E.P.Ltd.

However, current T.E.P.Ltd, assessment appears to regard the mineralised zone as not being a mineable body under present conditions, and no independant B.M.R. calculations of average grades and tonnages have been made, apart from a preliminary assessment by Pritchard (1964), based on less information than is now available.

This mineralization does not continue or could not be traced to the north-east trending fault at 4S/14W. This fact does not favour the existence of major mineralization at Area 55B.

Two churn drill holes (CD 154 and CD 158) penetrated the peak area ofthe copper anomaly, but only 0.78% Cu was recorded in CD 158 at 55-60'.

In the remainder of thearea, only sporadic trace copper and lead mineralization has been recorded in drill holes.

Areas north-east of AREA 55A.

Information from diamond drill cores and from churn and auger drill cuttings suggest that the sequence is:-

COLDEN DYKE FORMATION	sericitic slate black carbonaceous slate ± chloritic slate, 'amphibolite'
COOMALLIE DOLOMITE	tremolitic dolomite.

Two high copper values in chloritic schist were recorded at

34S/32W
36S/32W 1500 ppm Cu.

The anomaly appears to follow a north-east trending fault. Deep auger drilling, say 24 auger holes on a 100 x 100 foot grid, is tentatively recommended.

AREA 55B (Plate 12b)

Subsurface in formation as obtained from auger cuttings suggests that the sequence is:

GOLDEN DYKE FORMATION	sericitic slate carbonaceous slate chloritic slate
COOMALIE DOLOMITE	yellow brown and red silt and sand (presumably weathered arenaceous dolomite and calcareous shale)

Yeaman and Pritchard (1965) have recorded the occurrence of muscovite and possibly lepidolite or phlogopite between 00W/14N and 4W/16N. Tin and beryllium were recorded in geochemical analyses from this locality and they suggest that these elements were introduced by acidic pegmatites which were intruded into the Coomalite Dolomite, but not into the Golden Dyke Formation.

The sequence here appears to dip to the north-west, and may form the eastern limb of a northerly trending syncline.

The prospect is bounded on the north by a north-easterly trending fault (interpreted from a slingram real component anomaly) and to the south by an inferred north-easterly trending fault.

Subsurface Radiometric Anomalies

A weak radiometric anomaly at 12N/16W with average readings of about 0.024 mR/Hr is the only radiometric observation noted as being of interest by Ruxton and Shields in 1962. They concluded that no more exploration for uranium warranted in this area.

Geochemical Anomalies

Copper and lead values recorded in 1962 geochemical survey were as follows:-

Locality (Area 55 local grid)		Pb ppm	Cu ppm	Ni ppm
8N	12 W	5000	5000	300
8N	14 W	150	500	200
6N	12 W	2000	300	

A vanadium anomaly lies just north-west of the copper-lead anomaly and extends from 4N to 13N. The maximum values are 500 ppm at 12N/14W and 12N/16W.

The anomalous values of copper and lead lie west of a low arcuate ridge with outcrops of quartzite and silicified slate which trends from 7N,11W to 10N, 12W. The foliation planes dip outwards from the structure and one set of lineations plunge north-west at 40°. A ferruginised rubble zone gossaneous in part, occurs on the western limb of the arcuate structure. Assuming that the lineation measured is a "b" lineation, it is possible that the outcrops form a north-west plunging structure with gossan on thewestern limb..

A surface sample of the gossan at 850N 1250 W and another of the quartzite at 1000N 1250W (Area 55 local grid) were collected in August 1967 and atomic absorption spectrograph analyses were made for Cu, Pb, Zn, Ni, Co;

Sample No.	Locality (Area 55 local grid)	Cu	Pb	Zn	Ni	Co
		(in ppm)				
67123046(gossan)	850N 1230 W	310	280	290	80	75
67123047(quartzite)	1000N1250 W	15	40	8	-5	10

It is possible that the anomalies at Area 55B represent a down-faulted continuation of the mineralization from Area 55 and that the anomalies are not fully developed at the surface. In view of this it is recommended that Ruxton's proposals to test the anomalous area with deep auger drilling on a 100 x 100 foot grid, should be carried out. Depending on results of this auger drilling, diamond drilling may be warranted. (see appendix on list of diamond drill holes proposed by Ruxton).

AREA 55 WEST.

Lithologies are based on diamond drill cores and to a lesser extent on auger cuttings, but the lithological units cannot be traced laterally for any distance, as carbonaceous chloritic and calcareous slates are all reported to rest directly on the underlying tremolitic dolomites in different parts of the area. A tentative succession is as follows:

GOLDEN DYKE FORMATION	6. sericitic slate and schist 5. chloritic schist, grey slate and quartzite 4. calcareous chlorite schist, biotite calcite schist, mica schist. 3. chlorite schist, black calcareous siltstone and shale.
COOMALIE DOLOMITE	2. limestone, tremolitic chlorite schist calcareous amphibolite 1. limestone, dolomitic limestone.

It is probable that the amphibolites are highly metamorphosed dolomites. The mica schist may be equivalent to the biotite calcite schist which was previously called 'calcareous chlorite schist'.

A weak radiometric anomaly trends parallel to the strike of the Golden Dyke Formation from 46W/16S to 40W/16S and terminates against a north-north-west trending fault on the east. The maximum readings are 0.048 mR/Hr at 46W/18S and uranium mineralization in excess of 0.5 lbs U_3O_8/ ton has been recorded in four diamond drill holes as follows.

DD 543 63' - 105'; maximum 3' x 1.53 U_3O_8/ ton, at 87'-90' in mica schist and pyritic chlorite schist.

DD 607 317' - 332'; 15' x 0.68 lbs U_3O_8/ ton in limestone.

DD 581 80' - 92'; 12' x 3.2 lbs U_3O_8/ ton in grey mica schist.

DD 582 82' - 86'; 4' x 1.2 lbs U_3O_8/ ton in pyrite chloritic schist near grey mica schist.

Both holes DD 581 and 582 lie near the fault suggesting a structural control for the mineralization, at least in part.

Geochemical Anomalies

An irregular copper geochemical anomaly overlies both the dolomite and the slates, but appears to be intensified on the west side of the north-north-east trending fault. A maximum value of + 5000 ppm copper was recorded at 39W/18S.

Other anomalies of nickel, vanadium, zinc, lead and molybdenum are scattered mainly to the west of the fault and tend to be concentrated over the Golden Dyke Formation.

Only trace copper and lead mineralization has been found in diamond drill holes in this area.

In DD 604 trace copper and lead mineralization occurs in sericitic slate at 55' and in DD 606 in silicified and brecciated sericitic slate between 217' - 221' - presumably the latter is associated with the fault.

Ruxton has proposed two inclined diamond drill holes to the east of the peak of the copper anomaly to test any mineralization within the fault zone in this area.

Other Areas: Radiometric.

Scattered weak radiometric anomalies have been recorded in soil and weathered rock over dolomite, particularly in the north-eastern part of the sheet area.

Readings in soil and weathered rock of 0.048 and 0.044 mR/hr were also recorded within the Crater Formation at 17400E, 16200N and 18200E/16200N respectively.

Other holes around these localities show lower readings, but in several of them, which were not deep enough to reach weathered bedrock, the values were still increasing at the bottom of the holes.

Deep auger drilling to test this area is therefore tentatively suggested.

Geochemical.

Scattered low intensity copper, cobalt, and molybdenum 'anomalies' are located along the Giant's Reef Fault overlying Coomalie Dolomite. However no further testing is recommended at this stage.

In general it appears that the anomalies, both radiometric and geochemical, tend to be associated with greenschist, calc-biotite schist and chlorite schist. In that part of the area north-east of Area 55A which is devoid of these rock types near the dolomite-slate contact, and again north of Area 55B, there is a marked falling off in the density of anomalies.

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APPENDIX.

List of diamond drill holes proposed by Ruxton (File 84Nt/4-7B; March, 1963) and not yet drilled.

AREA 55B

The Target.

High copper (5000 + ppm) and lead (5000 + ppm) values occur in weathered rock in auger hole 8N 12 W, and moderate values (300 ppm and 2000 ppm respectively) in soil upslope in auger hole 6N 12W which did not penetrate the weathered rock.

These anomalies are on the north-westerly dipping contact between calcareous shale (S.E.) and carbonaceous and chloritic shale (N.W.). A prominent outcrop of silicified shale trends north for 300 feet from 7N 11.6W and curls around to the east on the northern end (to 10N 12W). Another easterly projection of quartz rubble occurs at 8N 12W. Between these two projections the surface is gilgaied, probably due to the presence of amphibolite. A considerable amount of ferruginous rubble, some of it gossan, occurs between the silicified shale and the gilgaied ground.

A Slingram real component anomaly, depicting a major shear zone, trends north-east several hundred feet north-west of the contact between carbonate rock and shale. At 6N 19W the real component decreases to 75%. Amphibolite was encountered in auger holes 4N 6N, and 8N on line 18W. Around this amphibolite, expressed at the surface by gilgai, actinolite schist and quartz rubble occurs, some of it carrying boxworks and some pyrite.

Proposals.

Deep follow-up auger drilling should be carried out on a 100 x 100 foot grid between 8N 12W and 6N 18W, and the surface outcrops around 8N 12W should be mapped in more detail.

Three inclined diamond drill holes are tentatively proposed:

Diamond Drill Hole Number.	Co-ordinates of Collar Geophysical Grid Area 55B 1962	Bearing	Depression	Length.
H	21W 6N	Grid East (125° From T.N.)	60°	500
J	17.5W 7N	Grid East	60°	500
K	14W 8N	Grid East	60°	500

AREA 55 WEST.

The Target

A moderate (1000 ppm) copper anomaly in weathered rock surrounds auger holes 40W 19S, 39W 19S, and 39W 18S. At the latter 5000 ppm copper was recorded. Lower contours suggest that the anomaly is narrow and trends north. It is sub-parallel to and about 100 feet west of a prominent north-east trending shear zone which separates tremolitic shales on the west from sericitic phyllites on the east.

A weak Turam anomaly (with ratios 1.08 to 1.16) centred on 42W 18S trends north-west for 800 feet and the south-eastern end of this encloses auger hole 39W 18S where the high copper values were obtained.

Proposals.

Two inclined diamond drill holes are sited to test this shear zone:

Diamond Drill Hole Number	Co-ordinates of Collar Geophysical Grid Area 55 West 1961	Bearing	Depression	Length.
F	40W 18S	Grid East (125° from T.N.)	60°	500
G	40W 20S	Grid East	60°	500

The dip of this shear zone is not known, but is thought to be steep. If vertical, the drill holes would intercept it at about 240 feet vertical depth.

Notes on Compilation of Sheet E01

Rum Jungle

(Plate 14)

History of Exploration

1. In 1964 B.M.R. made a reconnaissance auger drilling, geochemical and subsurface radiometric survey in the eastern part of the sheet area (Dodson and Shatwell, 1965). Electromagnetic, magnetic and surface radiometric surveys were also carried out in the same area by the B.M.R. at the same time (Ashley, 1966).

2. In 1965 six diamond drill holes were drilled by T.E.P. Ltd to test geochemical anomalies outlined by the 1964 B.M.R. survey.

3. In 1966 T.E.P. Ltd auger drilled that part of the area covered by the 1964 B.M.R. survey between 8000 N - 12800 N and 8400 E - 10400 E to check on geochemical results (T.E.P. Ltd "Triangle South Area").

4. In 1966 T.E.P. Ltd carried out surface mapping west of the 1964 B.M.R. survey area (Harjoribanks, 1967).

Geology

Four formations, all striking northerly, occur in the area covered by the sheet. These are from east to west: The Crater Formation, Coomalie Dolomite, Golden Dyke Formation and Burrell Creek Formation.

The sequence in the area is outlined below.

BURRELL CREEK FORMATION	quartzose, sericitic and chloritic slate and greywacke
GOLDEN DYKE FORMATION	micaceous slate quartz sericite slate, minor amphibolite and black slate mica schist, dolomitic sericitic slate
COOMALIE DOLOMITE	silicified tremolite schist and dolomite, minor biotite talc tremolite schist
CRATER FORMATION	siltstone, arkose, conglomerate

The contacts between the Crater Formation, the Coomalie Dolomite and the Golden Dyke Formation are offset by north-east striking faults. These formations in the eastern half of the Sheet area dip at approximately 50° to the west and north-west. A lineation of stretched quartz pebbles in the Crater Formation trends northerly with a plunge of about 5°, and it has been suggested by Dodson and Shatwell (1965) that the principal fold direction is northerly.

Radiometric Results

The 1964 B.M.R. survey outlined a small radiometric anomaly at 12,200 N 9600 E with a maximum reading of .055 mR/Hr in dolomite. The 1966 T.E.P. Ltd survey outlined a radiometric anomaly covering the same general area but centered at 9800 E 11200 N with a maximum reading of 230 counts/second. T.E.P.Ltd drilled five diamond drill holes in the area covered by the radiometric anomalies, but these did not reveal

any significant radioactivity. However, in DD 834, 1400 feet south of the radiometric anomalies, 0.25 lbs U_3O_8/ton was recorded between 214' - 216' in dolomite.

Three small radiometric anomalies were located by the 1964 B.M.R. survey in the area occupied by the Crater Formation. The maximum reading of .041 mR/Hr. was recorded at 11400 N 11400 E.

The 1966 T.E.P. Ltd survey recorded a small radiometric anomaly at 8000 N 10000 E with a maximum reading of 200 counts/second in dolomite.

Dodson and Shatwell (1965) have noted in their report that in a number of auger drill holes the radioactivity was still increasing at the bottom of the hole. These holes are shown on the map provided with this report. Deeper auger drilling to test these localities is recommended.

Geochemical Results

As in the area covered by sheet E71, the eastern part of the sheet E81 area was first auger drilled in 1964 by B.M.R. and auger samples were analysed by A.M.D.L. using the optical emission spectrograph method. Later check analyses of the auger samples by B.M.R., and the results of the 1966 T.E.P. Ltd auger drilling, have indicated that the original A.M.D.L. geochemical values were too high.

The 1964 B.M.R. survey outlined two geochemical anomalies in the Coomalie Dolomite near the Coomalie Dolomite- Golden Dyke Formation contact. Anomalous values of copper, nickel, cobalt, zinc and molybdenum were recorded in these anomalies which are referred to as "anomalies I and II" (see table of peak values). A separate nickel and cobalt anomaly occurs further east of the dolomite-slate contact ("anomaly III").

The 1966 T.E.P. Ltd survey recorded anomalous copper, lead and zinc values within anomalies I and II, but only anomalous copper values were obtained within anomaly III. However these T.E.P. Ltd anomalies were less extensive in area than those obtained by the B.M.R. survey.

Six diamond drill holes were put down by T.E.P. Ltd in this area, but the only recorded mineralization is 1.9%Pb between 370' - 375' in DD 822. No base metal mineralization was recorded in the other five diamond drill holes.

Anomaly I

Extends from 8800 N to 10800 N in dolomite near slate-dolomite contact.

Locality (T.E.P.Ltd mine grid)		Cu ppm
9000N	9800 E	800
9800N	9600 E	1000
10600N	9200 E	600 (800)
10000N	9600 E	(580)
		Co ppm
10600N	9600 E	250
9000N	9800 E	300
		Ni ppm
10200N	9600 E	1200

Locality (T.E.P. Ltd mine grid)		Zn ppm
10200 N	9800 E	400
10000 N	9600 E	(490)
10600 N	9200 E	40 (760)

Anomaly II

Extends from 11000 N to 12500 N in dolomite near slate-dolomite contact.

Locality (T.E.P. Ltd mine grid)		Cu ppm
11800 N	9600 E	1000 (400)
11200 N	9600 E	1500 (800)
11800 N	9400 E	500 (460)
		Pb ppm
12400 N	9600 E	(680)
		Ni ppm
11400 N	9200 E	2500
11400 N	9400 E	1200
11800 N	9200 E	1200
11800 N	9600 E	1500

Locality (T.E.P. Ltd mine grid)		Zn ppm
11400 N	1000 E	500
11800 N	9600 E	400
11800 N	9800 E	400
12200 N	9800 E	800
11200 N	9800 E	(530)
11800 N	9600 E	(550)
12000 N	9800 E	(500)
12400 N	9600 E	(1080)
		Mo ppm
11800 N	9600 E	80

Anomaly III

Extends from 9400 N to 10600 N, east of anomaly II, in dolomite.

Locality (T.E.P.Ltd mine grid)		Cu ppm
10000 N	10200 E	(600)
10400 N	10000 E	(436)
		Co ppm
10200 N	10200 E	400
		Ni ppm
10200 N	10200 E	1500

Note: Values in brackets are atomic absorption spectrograph analyses from 1966 T.E.P. Ltd survey.

Copper and lead anomalies of moderate intensity have also been outlined within the Golden Dyke Formation by the T.E.P. Ltd and B.M.R. Surveys. A copper anomaly as outlined by the 1966 T.E.P. Ltd survey extends from 8000 N to 10000 N with peak values as follows.

Locality (T.E.P. Ltd mine grid)	Cu ppm
8600 N 9200 E	(500)
8800 N 9200 E	(484)
8800 N 9600 E	(484)
9600 N 9000 E	(442)

The 1964 B.M.R. survey also recorded high lead values at 10600 N 8600 E: 800 ppm Pb; and at 10200 N 8800 E: 500 ppm Pb; the T.E.P. Ltd survey did not substantiate the results around these two localities and it is probable that the B.M.R. values are too high.

No further work is recommended on these anomalies at the present time.

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NOTES ON COMPILATION OF E82

RUM JUNGLE, N.T.

History of Exploration

1. In the period 1958-1959 T.E.P. Ltd. drilled one diamond drill hole, one churn drill hole and dug 8 costeans in Zeta area (centered at 15100N 22700E T.E.P. Ltd. mine grid co-ordinates) to test a radiometric anomaly.

2. In 1962 the B.M.R. extended the Rum Jungle Creek and Flynn's local grids north-westwards over the Zeta area and carried out surface radiometric and electromagnetic surveys. (Haranzana, 1963).

3. In 1962-1963 the B.M.R. phosphate field party mapped the areas covered by the Zeta, Flynn's, and Rum Jungle Creek local grids; auger drilled the part of the Rum Jungle Creek grid to 20', and drilled 15 rotary drill holes to test for phosphate mineralization. (Pritchard et al. 1963 and 1966).

4. In 1964 B.M.R. made

   (a) a reconnaissance auger drilling, subsurface radiometric and geochemical survey in the western part of the sheet area. (Dodson and Shatwell, 1965).

   (b) carried out surface radiometric, magnetic and electromagnetic survey in the same area. (Ashley, 1966).

5. In 1964 T.E.P. Ltd. made a reconnaissance auger drilling, subsurface radiometric and geochemical survey east of the Giants Reef Fault (Waterhouse North area).

6. In 1964 T.E.P. Ltd. drilled 4 diamond drill holes to test a slight increase in radioactivity in the eastern part of the area covered by the Waterhouse North auger survey.

Geology

The formations occurring within the area covered by E82 are outlined below -

Superficial Deposits	ferruginised sediments (ferruginous breccia, ferruginous sandstone, "laterite")
Golden Dyke Formation	grey slate, black slate, black dolomitic slate, amphibolite
"Hematitic quartzite breccia" (Pritchard's "Castlemaine Beds")	hematitic quartzite breccia, hematite rock, ferruginous siltstone and sandstone, phosphate rock
Coomalie Dolomite	dolomite, silicified and tremolitic dolomite, tremolitic and/or dolomitic slate and schist
Crater Formation	siltstone, arkose, conglomerate

The Giants Reef Fault zone trends north-east across the western half of the sheet area (estimated horizontal displacement 3½ miles with west block moving north-east, vertical displacement not known but the west block is uplifted in relation to east block).

The Crater Formation occurs on the western side of the Giant's Reef Fault and dips north-west at about 45°. Lineations of stretched pebbles in the formation plunge northerly at about 34°. In the far north-western corner of Sheet E82 the Crater Formation is overlain by the Coomalie Dolomite.

The Coomalie Dolomite occupies most of the sheet area on the eastern side of the Giant's Reef Fault. In the eastern part of the sheet area, black slates and dolomitic black slates of the Golden Dyke Formation form a synclinal structure which appears to become shallower towards the north-west, and the dolomitic black slates west of 22000E may represent the basal sequence of a folded Golden Dyke Formation.

Outcrops of hematitic quartzite breccia occur in the Zeta area in the north-eastern part of the area covered by sheet E82. The "H.Q.B." and related rocks appear to overlie dolomite, but their structural relation to the Coomalie Dolomite is not clear and these rocks have been tentatively included in the Lower Proterozoic sequence.

Rocks of the Golden Dyke Formation abut against the eastern side of the Giant's Reef Fault. The structural relationships of these rocks in this area are not clear, but they may represent:-

(a) a faulted portion of the Golden Dyke Formation from Browns south-west area

(b) a drag-folded continuation of the synclinal structure in the eastern part of sheet E82.

Subsurface Radiometric Anomalies.

Zeta Area

T.E.P. Ltd. drilled one diamond drill hole (DD363) and one churn drill hole (C332), and dug eight costeans to test a surface radiometric anomaly for uranium mineralisation. Maranzana (1963) stated that the best uranium value encountered by T.E.P. Ltd. during this exploration was 0.3 lbs. U_3O_8/ton in DD363, but this value has not been recorded in diamond drill logs.

The 1963 B.M.R. geophysical survey confirmed the surface radiometric anomaly examined by T.E.P. Ltd.

During the period 1962-1963, B.M.R. investigated the area for phosphate mineralisation and drilled 15 rotary drill holes. Pritchard et al (1966) reported the phosphate mineralization encountered in B.M.R. and T.E.P. Ltd. drill holes as follows:-

		P_2O_5
DD363	36'	x 11.9%
R66	45'	x 8.0%
R93	145'	x 8.8%

Pritchard estimated a possible reserve of 66,000 tons of 8% P_2O_5 rock in this area.

1964 B.M.R. Survey

The maximum radiometric reading recorded in the sheet area in the course of this survey was at 15000N 12400E (.064 mR/Hr, and radiometric readings increasing at the bottom of the hole). Several other holes around this locality also recorded increasing radiometric readings at the bottom. Deeper auger drilling in this area is tentatively recommended.

Waterhouse North Area (15000E to 23900E T.E.P. Ltd. mine grid)

T.E.P. Ltd. auger drilled this area in 1964 and carried out subsurface radiometric and geochemical surveys. Maximum radiometric readings of 200 counts/minute (Ericsson ratemeter, "D" range) were obtained at 13000N 22600E and 13600N 22600E. Four diamond drill holes drilled by T.E.P. Ltd. further east did not record any significant radioactivity (Plate 15).

Geochemical Anomalies

Optical emission spectrograph analyses of auger cuttings from the 1964 B.M.R. and T.E.P. Ltd. auger drill surveys did not show any major geochemical anomalies within the area covered by sheet E82. The highest geochemical values from both surveys are listed below.

Locality (T.E.P. Ltd. mine grid)		
13200N 22000E	250 ppm Cu	T.E.P.Ltd. Survey
12800N 23900E	250 ppm Ni	
11400N 23900E	250 ppm Co	
12800N 17400E	150 ppm Zn	
10600N 14400E	100 ppm Pb	B.M.R. Survey
10600N 12000E	60 ppm Mo	

A sample of ferruginised quartzite and dolomitic breccia was collected from 11000N 21000E (Mine grid) for geochemical analysis. Atomic absorption spectrograph analysis of the sample indicated 35ppm Cu, 5 ppm Pb, 4 ppm Zn, 12 ppm Ni, 10 ppm Co.

No further exploration is recommended in this area.

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NOTES ON COMPILATION OF E.63 RUM JUNGLE, NORTHERN TERRITORY. (Plate 16a)

HISTORY OF EXPLORATION

1. (a) B.M.R. carried out airborne scintillometer surveys in the area in 1951 (Wood and McCarthy, 1952) and in 1957 (Livingstone 1959)

   (b) T.E.P. Ltd carried out a low level airborne scintillometer survey in1956.

2. The north-eastern part of the sheet area was mapped by P.H.Dodd (Dodd, 1953).

3. During the period 1955-56 T.E.P. Ltd drilled 1 diamond drill hole and 9 churn drill holes to test a surface radiometric anomaly at Rum Jungle Creek Prospect, centred at 13,300N 25,000E T.E.P. Ltd. Mine grid.

4. During 1956 - 1961 T.E.P. Ltd churn and diamond drilling was continued in Rum Jungle Creek South area where a uranium orebody was outlined.

5. During 1960-62 B.M.R. carried out a number of geophysical surveys Daly and Rowston (1962); Douglas (1962a, 1962b); Maranzana (1963); Rowston (1962).

6. During 1961-1963 the uranium orebody at Rum Jungle Creek South was excavated by an open cut.

7. During 1961-62 B.M.R. carried out auger drilling, subsurface radiometric and geochemical surveys (Ruxton and Shields 1963a, b.)

8. During 1961-62 T.E.P. Ltd drilled 18 diamond drill holes between 10W - 8E (Rum Jungle Creek local grid) and drilled six more diamond drill holes in Rum Jungle Laterites, Geolsec and Explicks, areas, located at 14800N - 27300E; 12500N-29300E; and 13400N-28400E respectively (all co-ordinates of T.E.P. Ltd mine grid). Spratt,(1962).

9. A phosphate survey was carried out by B.M.R. during 1962-1963 (Pritchard et al. 1963, 1966).

10. In 1963 Williams made structural analysis of the geology at Rum Jungle Creek south and other areas in the Hundred of Goyder.

11. In 1964 T.E.P. Ltd carried out reconnaissance auger drilling along traverses 2E and 54E (Rum Jungle Creek and Rum Jungle Creek south, local grids respectively)

12. In 1966 T.E.P. Ltd drilled ten waggon drill holes at the north-west end of Rum Jungle Creek Prospect to examine the feasibility of deep reconnaissance drilling as a means for uranium exploration (Berkman-1966).

GEOLOGY

A generalised geological setting is considered to be as follows.

1. A complex synclinal structure, comprising the Golden Dyke Formation and Coomalie Dolomite occurs in the south-western part of the sheet area and trends roughly N.W. - S.E. Uranium mineralization occurs in this syncline at Rum Jungle Creek and at Rum Jungle Creek South. To the north-west the syncline abuts against the hematitic-quartzite-breccia. ("Castlemaine Beds" of Pritchard et al 1966).

2. The Castlemaine Beds extend over an area of about 15000' x 3,000, which extends beyond the limits of E83 to the north-west and south-east, they do not outcrop on the south-western flank of the syncline between the Coomalie Dolomite and the Golden Dyke Formation. Information derived from diamond drill holes suggests that the contact between the Golden Dyke Formation and the Castlemaine Beds dips south-west. The "Castlemaine Beds" are succeeded to the north-east by sporadic outcrops of dolomite and then by the Crater Formation.

3. On the south-western side of the syncline, amphibolite interbedded with chlorite schist was encountered in a T.E.P. Ltd diamond drill hole (DD337) to a depth of 1338 feet. Bryan (1962) described rocks both of sedimentary and igneous origin from this hole.

4. South-west of the amphibolite, dolomite black shale occurs; this overlies the Coomalie Dolomite, which in turn rests on the Crater Formation in the southwestern corner of Sheet E83.

The generalised stratigraphic sequence encountered in the area is considered to be as follows.

	(e) chloritic schist and slate ("orebody chlorite schist" at Rum Jungle Creek South).	
GOLDEN DYKE FORMATION	(d) black slate	
	(c) chloritic slate - dolomitic in part	(amphibolite)
	(b) black slate and dolomite black slate	
	(a) black and chloritic slate interbedded with hematitic mudstone and hematic quartzite breccia.	
COOMALIE DOLOMITE		
Castlemaine Beds (Pritchard et al. 1966)	(i) hematitic quartzite breccia	
	(h) hematitic siltstone and sandstone	
	(g) hematitic quartzite	
	(f) phosphate rock	
	(e) hematite rock (ferruginised dolomite?)	
	(d) limonitic siltstone and sandstone	
	(c) limonitic quartzite	
	(b) chloritic siltstone and sandstone	
	(a) grey shale and siltstone	
	limestone, dolomite, ± black shale.	
CRATER FORMATION	Siltstone, quartzite, arkose, conglomerate.	

The hematitic quartzite breccia is regarded by the writer as being part of the Lower Proterozoic sequence. It occurs interbedded with the Golden Dyke Formation black slates at Rum Jungle Creek Prospect and steeply dipping grey and tan siltstones were found to occur within the main body of the hematitic quartzite breccia south-east of the prospect.

Pritchard et al (1966) stated that the structure of Castlemaine Hill is an isoclinally folded sequence which has been deformed by a later monoclinal fold with an axis along the western side of the hill. This structural setting is based on earlier work by Williams (1963) at Rum Jungle Creek South open cut. Pritchard also supports a suggestion put forward by Williams that the hematitic quartzite breccia represents an originally siliceous sedimentary sequence which has been brecciated during folding.

The writer supports the idea that the breccia was originally formed as a distinct lithological unit some time during the deposition of the Lower Proterozoic sequence.

URANIUM MINERALIZATION

Rum Jungle Creek South

The Rum Jungle Creek South orebody was by far the largest of the uranium orebodies mined in the Hundred of Goyder. Berkman (1964) and Williams (1963) described the local geology and structure in detail and only a brief comment is made here.

Berkman (1964) described the uranium orebody as follows:

"The orebody was an elongate tabular mass, of uranium dimensions 800 feet long north-west and 200 feet wide and was mined for about 150 feet vertically. The weathered rock overlying the orebody, some 75 feet thick, was barren of uranium mineralization except for three small pods of saléeite.."

In the open cut between 35E and 37E (Rum Jungle Creek South local grid)part of the ore grade mineralization extends below the floor of the open cut for a short distance (30' - 40'). The highest grade of mineralization accorded in this section was in DD391 (56lbs. U_3O_8/ton between 221.3' - 223.6').

Sporadic high and low grade uranium mineralization, mainly between 140' to 210' below surface, continues beyond the perimeter of the open cut to the north-west and is scattered over an area of approximately 1200 feet long and 380 feet wide. This area has been extensively drilled by T.E.P. Ltd. the best intersections being :

CD 305 - 145' - 196'; 51' x 7.1 lbs. U_3O_8/ton

DD 494 - 179' - 182'; 3' x44.0 lbs. U_3O_8/ton.

Mineralization in theother holes is generally much lower and less continuous.

It may be warranted to test the possible extension of the mineralization in CD 305 to the north-east. (Plate 16f.) A drill hole collar of 100 feet south-west of C305, depressed at 55° to the north-east is recommended.

South-east of the open cut only one hole encountered more than 1 lb U_3O_8/ton (DD497 - 289' -292'; 3' x 1.35 lbs. U_3O_8/ton).

Rum Jungle Creek Prospect.

Spratt (1962) states that this prospect was discovered in 1953 and was drilled by T.E.P. Ltd. in 1955-56 (9 churn drill holes, 1 diamond drill hole) to test a small surface radiometric anomaly. T.E.P. Ltd. also drilled 18 additional diamond drill holes during the period 1961 - 1962 between 16W - 20W (Rum Jungle local grid).

The stratigraphic succession in this area is considered to be as follows:

	Chloritic slate
	purple and hematitic slate, chloritic slate
GOLDEN DYKE	black slate
FORMATION	# dolomite
	chloritic slate
	black slate interbedded with mudstones, siltstones and hematitic quartzite breccia (amphibolite)
COOMALIE DOLOMITE	dolomite
"Castlemaine Beds"	hematitic quartzite breccia, grey slate, siltstone.
	limestone, dolomite, ± chloritic slate.

The Golden Dyke Formation appears to form a complex synclined structure trending north-west. To the north-east the hematitic quartzite breccia is in direct contact with black shales and lenses of breccia occur within the black slate. Approximately 180 feet north-east of the slate-breccia contact w a B.M.R. rotary drill hole (R.60 - 1200W 1200N; Rum Jungle Creek local grid) encountered fragments of black slate at the bottom of the hole.

Below the ground surface and south-west of the slate-breccia contact a wedge of dolomite, thickening to the south-west appears between the Golden Dyke Formation and the Castlemaine Beds.

Sporadic low grade uranium mineralization has been encountered in one churn drill hole and three diamond drill holes in this area, the assay results are listed below.

CD 171	110' - 115';	5'x 1.43 lbs U_3O_8/ton.
DD 522	72' - 75';	3'x 1.39 lbs. "
	87' - 90';	3'x 1.01 lbs. "
	108' - 111';	3'x 1.10 lbs. "
DD 523	134' - 136';	2'x 3.54 lbs. "
DD 299	165' - 168';	3' x 1.25 lbs. "

Spratt (1962) recommended that two diamond drill holes should be drilled on either side of DD523 to test any extensions of uranium mineralization (presumably along strike). This recommendation has not been carried out.

Rum Jungle Creek East Area (Plate 16h).

A sequence of grey and red slate and shale occur within the hematitic quartzite breccia east of Rum Jungle Creek Prospect.

North-west of this area high radioactivity was recorded in slates within the hematitic quartzite breccia in B.M.R. rotary drill hole R60. However, radiometric assays of drill cuttings over part of the radioactive interval in the hole gave less than 0.003% U_3O_8 and the radioactivity of the cuttings was very low.

To the west of this area low grade uranium mineralization was recorded in black slates near the hematitic quartzite breccia in TEP Ltd diamond drill hole [illegible].

The surface radiometric background in the area was measured with a field ratemeter and the readings were taken in the valley north-west of the slate exposures of 7N8W 'Flynn's local grid). A slight radiometric anomaly was outlined directly over the slate exposures, but only low radiometric values were recorded in the valley to the north-west. However, the surface soil cover may have masked any subsurface radiometric anomalies present.

Reconnaissance auger or blast hole drilling of the valley between 8W and 24W (Flynn's local grid) is recommended to trace the extension of the slate along strike and test for any subsurface radioactive anomalies.

Rum Jungle Laterites, Geolsec, Easticks:

T.E.P. Ltd drilled a total of six diamond drill holes to test surface radiometric anomalies in these areas. No significant uranium mineralization was encountered in any of these holes.

Radiometric Results from Auger Drilling Surveys.

Radiometric anomalies outlined by the 1961 B.M.R. auger drill survey are listed below.

	Locality	Radiometric units	
1.	2W 29N (Flynns local grid)	0.073	Rum Jungle Creek laterites area.
2.	27E 10N (Rum Jungle Creek South) local grid	0.180	Rum Jungle Creek South
3.	40E 9N (Rum Jungle Creek South) local grid)	0.073	Rum Jungle Creek South
4.	51E 8N (Rum Jungle Creek South) local grid	0.085	

All readings were made in weathered rock. Surface specimens of limonitic rock from Flynns locality submitted for assays recorded up to 0.15% U_3O_8 (equivalent to 3.36 lbs. U_3O_8/ton). However two diamond drill holes and three churn drill holes drilled in the vicinity of the radiometric anomaly by T.E.P. Ltd did not substantiate the surface assays.

Localities 2 and 3 represent north-westerly and south-easterly extensions of the Rum Jungle Creek South uranium mineralization. Both areas have been drilled by T.E.P. Ltd and their results have been outlined earlier in this report.

Two diamond drill holes (DD638, DD645) were drilled by T.E.P. Ltd. about 100 feet north-west of locality 4. No significant uranium mineralization was encountered by these holes.

In the period 1962-63 B.M.R. carried out an extensive auger drilling survey (Pritchard et al, 1963(a), (b),) in the area covered by Sheet E33. Radiometric anomalies encountered by this survey are listed below.

	Locality (Flynns local grid)	Radiometric units	P_2O_5 mineralization
5.	14E 28N	0.085	no P_2O_5 evident
6.	13E 19N	0.105	low grade P_2O_5 mineralization.
7.	20E 26N	0.155	low grade P_2O_5 mineralization
8.	23E 18N	0.100	high grade P_2O_5 mineralization

Although field test for P_2O_5 in the auger drill hole at locality 6 were negative, phosphate mineralization is present in other holes immediately south east of this locality; which may account for the high radioactivity recorded at locality 6.

An auger drill sample from locality 7 gave 0.72 lbs. U_3O_8/ton between 4'6' below surface. Other samples from the same hole showed much lower values.

Other smaller and less intense radiometric anomalies were encountered by this survey to the south-east.

T.E.P. Ltd. auger drilling survey outlined low geochemical anomalies associated with a radiometric anomaly at the Rum Jungle Creek Laterites. Peak values are as follows:

Locality (Flynns local grid)	Cu ppm.	
4W 29N	175	(analyses with
2W 29N	175	biquinoline)
	Pb ppm.	
3W 30N	45	(analyses with
5W 28N	45	dithizone)

No further work is recommended in this area.

The 1962 B.M.R. auger drilling survey outlined a cluster of copper, lead, nickel and vanadium anomalies in the vicinity of a small radiometric anomaly (locality 8 in this report). The results were obtained by optical emission spectrograph analyses and the peak values are listed below.

Locality (Rum Jungle Creek) South local grid		
	Cu ppm.	
52E 7N	1500	
	Pb. ppm	(analyses by optical
49E 9N	300	emission spectrograph
49E 10N	300	
	Ni ppm.	
51E 7N	300	
	V	
53E 10N	300	

It is recommended that "scrape" samples of T.E.P.Ltd diamond drill holes DD638, 642 and 645, should be collected and atomic absorption spectrograph analyses carried out to determine their Cu, Pb, Ni and V, content.

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NOTES ON COMPILATION OF E93 (Plate 17a)

History of Exploration

1. The 1952 B.M.R. high level airborne scintillometer survey and both of the low level airborne surveys (1956 T.E.P. Ltd., 1957 B.M.R.) located anomalous radioactivity at Castlemaine Prospect and in Batchelor Laterites area.

2. In 1956 T.E.P. Ltd made a surface radiometric and geochemical survey in the Batchelor Laterites area and 26 churn drill holes were drilled. Radiometric and geochemical surveys were also carried out at Castlemaine Prospect and two churn drill holes were drilled.

3. During the period 1960-1962 T.E.P.Ltd. drilled 16 diamond drill holes at Castlemaine Prospect and 8 diamond drill holes at Batchelor Laterites. (Spratt 1962)

4. (a) During 1961-1962 B.M.R. auger drilled Rum Jungle Creek South Extended, Castlemaine Hill, Batchelor Laterites and Batchelor Laterites Extended grid areas. Subsurface radiometric and geochemical surveys were carried out in this auger drilling programme (Ruxton and Shields 1963 a,b.)

(b) During the period 1961-1963 B.M.R. conducted geophysical surveys (surface radiometric and electromagnetic) in Rum Jungle Creek South, Castlemaine Hill and Batchelor Laterite local grid areas (Rowston 1962 a,b); in Powerline area (Douglas 1962); and in Batchelor Laterites Extended area (Douglas 1964, Ashley 1965.)

5. During 1962-1964 B.M.R. investigated phosphate mineralization in the Powerline area, Area 4, Batchelor Laterites Extended and Castlemaine Prospect areas (Pritchard et al 1963, 1966.)

6. During 1962-1963 T.E.P. Ltd diamond drilled the "Conducting horizon" in the Rum Jungle Creek South and Castlemaine Hill areas, extending to the east of the Batchelor Laterites area (Spratt 1963).

7. In 1964 T.E.P. Ltd. carried out auger drilling in the following areas:

(a) auger drilling was extended south-west along traverses 8000E and 10600E (Rum Jungle Creek South local grid).

(b) reconnaissance auger drilling was carried out in the Waterhouse East area in the south-eastern part of the sheet area. (Spratt 1964)

Geology.

The general features of the geology as described in the area covered by E83 continue south-east into E93 sheet area.

The "Castlemaine Beds" form a prominent ridge and its south-eastern end is bordered by the Coomalie Dolomite. The ridge consists largely of hematitic quartzite breccia and sandstone. Isolated bodies of breccia and sandstone occur within the dolomite near the edge of the ridge and small outcrops of limonitic quartzite breccia, "hematite rock", pink quartzite and quartzite breccia, hematitic siltstone and mudstone with phosphate mineralization extend further within the dolomite.

The Golden Dyke Formation occurs in a synclinal structure on the south-western side of the ridge and trends south-east. Further south-east in the Batchelor Laterites Extended area the strike swings to north-east. To the south-west across the strike, the Golden Dyke Formation appears to grade into dolomitic black shale which is associated with extensive masses of "amphibolitic" rock. The Coomalie Dolomite reappears in the south-western part of the sheet area.

The stratigraphic sequence as derived from drill holes in the area is outlined below.

	Post-Lower Proterozoic	ferruginised sediments (ferruginous breccia, laterite).
	GOLDEN DYKE FORMATION	chloritic schist and slate, black slate, chloritic slate, dolomitic black slate, "amphibolite"
		dolomite, mudstone.
COOMALIE DOLOMITE	"Castlemaine Beds"	hematite rock. quartzite, quartzite breccia. limonitic quartzite breccia. hematitic mudstone, hematitic siltstone. hematitic quartzite breccia, sandstone.
		dolomite, tremolitic dolomite, dolomitic black shale.

Radiometric Anomalies.

A number of small, but locally intense radiometric anomalies occur within the area covered by sheet E93 and extend east into the area covered by E94. Most of the anomalies occur within the Castlemaine Beds and the Coomalie Dolomite and some of these anomalies are associated with phosphate mineralization.

The anomalies are summarised as follows.

	Batchelor Laterites local grid		radiometric units
1.	14600 E 2200 N	-	0.041
2.	13700 E 650 S	-	0.050
3.	14400 E 200 S	-	0.129

The radiometric anomalies at the first two localities were outlined by the 1961 and 1962 B.M.R. surveys and the third was located by the 1963 phosphate survey. No uranium mineralization was encountered in any of the diamond drill holes drilled in the areas.

Geochemical Anomalies

The 1961 and 1962 B.M.R. auger drilling surveys outlined a well defined copper anomaly between 8000E - 10600E (Rum Jungle Creek South local grid) Anomalous values of nickel, cobalt and vanadium are also associated with this anomaly (anomaly 1).

The position of this anomaly follows the established pattern in the Rum Jungle district as it straddles the Golden Dyke Formation - Coomalie Dolomite contact. However, in this locality the dolomite is overlain by ferruginised dolomite ("laterite") and further north-east by hematitic quartzite breccia.

A lead anomaly (anomaly 2) and another copper anomaly (anomaly 3) occur in the Golden Dyke Formation south-west and south of anomaly 1.

A separate group of lead, copper and vanadium anomalies occur further south-east (anomaly 4), around 13200E 1400S (Batchelor Laterites Extended local grid).

Smaller geochemical anomalies with copper and lead values locally in excess of 800 ppm are scattered within the Golden Dyke Formation. The most intense of these anomalies are listed in Table 1.

TABLE 1

Anomaly 1 - occurs in Golden Dyke Formation and Coomalie Dolomite

Co-ordinates (Rum Jungle Creek South) local grid	
9400 E 400 N	2000 ppm Cu
10200 E 600 N	1900 ppm Cu
10600 E 600 N	2500 ppm Cu
8200 E 400 N	500 ppm Ni
9200 E 600 N	300 ppm Ni
8600 E 400 N	300 ppm Co
8400 E 600 N	300 ppm V

Anomaly 2. - occurs in Golden Dyke Formation

9200 E 00 N	1500 ppm Pb
9400 E 00 N	700 ppm Ni, 500 ppm Co, 200 ppm V.

Anomaly 3. - occurs in Golden Dyke Formation

10400 E 00n	1300 ppm Cu
(Castlemaine Hill) local grid	
10400 E 200 S	850 ppm Cu
10600 E 200 N	1600 ppm Cu

Anomaly 4. - occurs in Golden Dyke Formation

(Batchelor Laterites Ext.) local grid	
13200 E 1400 S	2000 ppm Cu, 1600 ppm Pb
13400 E 800 S	2000 ppm Pb
13400 E 1600 S	300 ppm V

TABLE 1 (cont)

Anomaly 5 - occurs in Golden Dyke Formation
(Batchelor Laterites Ext.)
local grid

13600 E 1800 S	1000 ppm Pb
13800 E 1600 S	1000 ppm Pb
14000 E 1600 S	500 ppm V

Anomaly 6 - occurs in Golden Dyke Formation

(Rum Jungle Creek South)
local grid

6600 E 400 S	1000 ppm Cu, 1000 ppm Pb.
	200 ppm Ni.

T.E.P.Ltd carried out a diamond drilling programme to test a "conducting horizon" in the Golden Dyke Formation. Some of these diamond drill holes were collated near or within the existing geochemical anomalies. No uranium and only very minor base metal mineralization was encountered in those holes. A summary of diamond drilling results is given below.

Anomaly 1 was drilled by 11 diamond drill holes and two of those intersected trace copper and lead mineralization as follows.

DD 529 - galena at 194' ; chalcopyrite at 210', 273'.
DD 531 - chalcopyrite at 94'

South-east of anomalies 1 and 3, two diamond drill holes encountered trace base metal mineralization:

DD 535 - 237' - 239';maximum Cu in hole - 0.74%.
- 245' - 247'; maximum Pb in hole 0.35%.
DD 536 - 274' - 176!; maximum Cu 2.8%

Anomaly 2 was drilled by two diamond drill holes. No mineralization was encountered.

A small lead anomaly near anomaly 4 was drilled by one diamond drill hole. Again no mineralization was encountered.

One diamond drill hole about 100 feet north-east of anomaly 6 failed to intersect any mineralization.

AMDEL GEOCHEMICAL SERVICE

JOB 1059/68 TABLE 11 BATCH NO 1.

Sample No	DD656	Cu ppm	Pb ppm	Zn ppm	Co ppm	Ni ppm
67123082	10-28'	790	20	30	140	120
3	28-46'	880	15	55	85	170
4	46-63'	1100	20	245	70	585
5	63-81'	2350	15	500	55	1000
6	81-102'	930	65	310	35	640
Std L M1						
7	102-125'	810	220	125	70	70
	DD658					
8x	10-27'	3350	75	190	140	845
9	27-45'	1550	100	95	80	345
90	45-65'	2250	200	200	200	650
1	65-85'	1300	40	90	130	225
2	85-109'	1550	25	150	200	400
3	109-127'	1350	10	155	110	300
4	127-145'	950	15	165	100	330
5	145-163'	320	25	65	95	240
6	163-179'	590	75	55	110	330
7	179-195'	420	95	50	180	170
8	195-203'	840	200	70	360	350
	DD664					
67123099	10-27'	1250	75	75	90	230
67123088x						

AMDEL GEOCHEMICAL SERVICE

JOB 1059/68 BATCH NO 2

Sample No	DD664 cont.	Cu ppm	Pb ppm	Zn ppm	Co ppm	Ni ppm
67123100	27-46'	3900	60	115	350	585
1	46-64'	950	35	70	120	250
2	64-84'	860	25	100	170	480
3	84-102'	730	30	120	65	320
4	102-119'	200	65	65	65	180
5	119-137'	120	45	40	30	100
Std LM2						
6	137-158'	150	25	30	40	95
7	158-179'	210	100	55	100	235
8	179-100'	540	200	90	200	340
	DD668					
9	18-35'	180	75	115	75	70
10	35-55'	290	200	140	75	70
11	55-74'	210	130	125	75	70
2x	74-93'	180	110	125	90	70
13	93-111'	350	200	130	130	75
4	111-129'	290	140	140	95	70
5	129-147'	460	170	170	55	75
6	147-166'	200	85	130	55	75
67123117	166-184'	420	130	140	70	80
12x						

AMDEL GEOCHEMICAL SERVICE

JOB 1059/68 BATCH NO 3

Sample No	DD668 cont.	Cu ppm	Pb ppm	Zn ppm	Co ppm	Ni ppm
67123118	184-201	2450	110	70	85	130
67123129	201-219	860	170	80	75	125
9	219-238'	460	220	115	40	80
20	239-258'	500	180	90	55	80
1	258-273'	520	120	75	45	95
2	273-292	400	100	70	35	90
3	292-312	390	110	75	35	120
4	312-328	2550	170	200	120	170
Std LM 3						
5	328-348	2250	120	60	80	90
6x	348-365	1300	140	55	70	105
7	365-385	670	240	70	60	75
8	385-401	470	170	80	55	65
67123126x						

SCHEME C1

RESULTS in ppm

Although drilling results have been disappointing, "scrape samples" of the existing diamond drill cores were taken in September 1967 and these were analysed for Cu, Pb, Zn, Co and Ni. It was thought that by this means it may be possible to establish a pattern of trace element distribution which may indicate areas that warrant further testing.

Anomaly 1 was selected for this exercise and scrape samples were taken from diamond drill cores 656, 658, 664 and 668 over a total core length of 881 feet. It was decided to take one bulk scrape sample from each core tray containing about 20 feet of core and 48 bulk samples were collected.

The geochemical analyses of the samples are listed in table 11.

It is evident from the distribution of copper and nickel values in cross section (Plates 17b, 17c) that the anomalies extend below the surface.

The highest copper values in DD's 656, 658 and 664 occur within the slates some distance above the contact with the dolomite. The extent of the anomaly to the south-west of DD 668 is not known. Diamond drill core from DD 663 could be assayed to check whether the copper anomaly persists to this locality and the same drill hole could be deepened up to 300 feet to check whether the Coomalie Dolomite contact has actually been reached in this hole, and whether the copper anomaly extends into the dolomite. This proposal however, can only be accepted a low priority.

The nickel anomaly is confined to the eastern part of the cross section in DD's656, 658 and 664.

It is evident that scrape sampling of the existing diamond drill cores could be used to define the pattern of trace element distribution and indicate areas where economic mineralisation could occur in depth. This method could, for instance, provide useful data at the Triangle North, Triangle South and Burton Creek prospects, where past diamond drilling of geochemical anomalies did not intersect any substantial mineralization.

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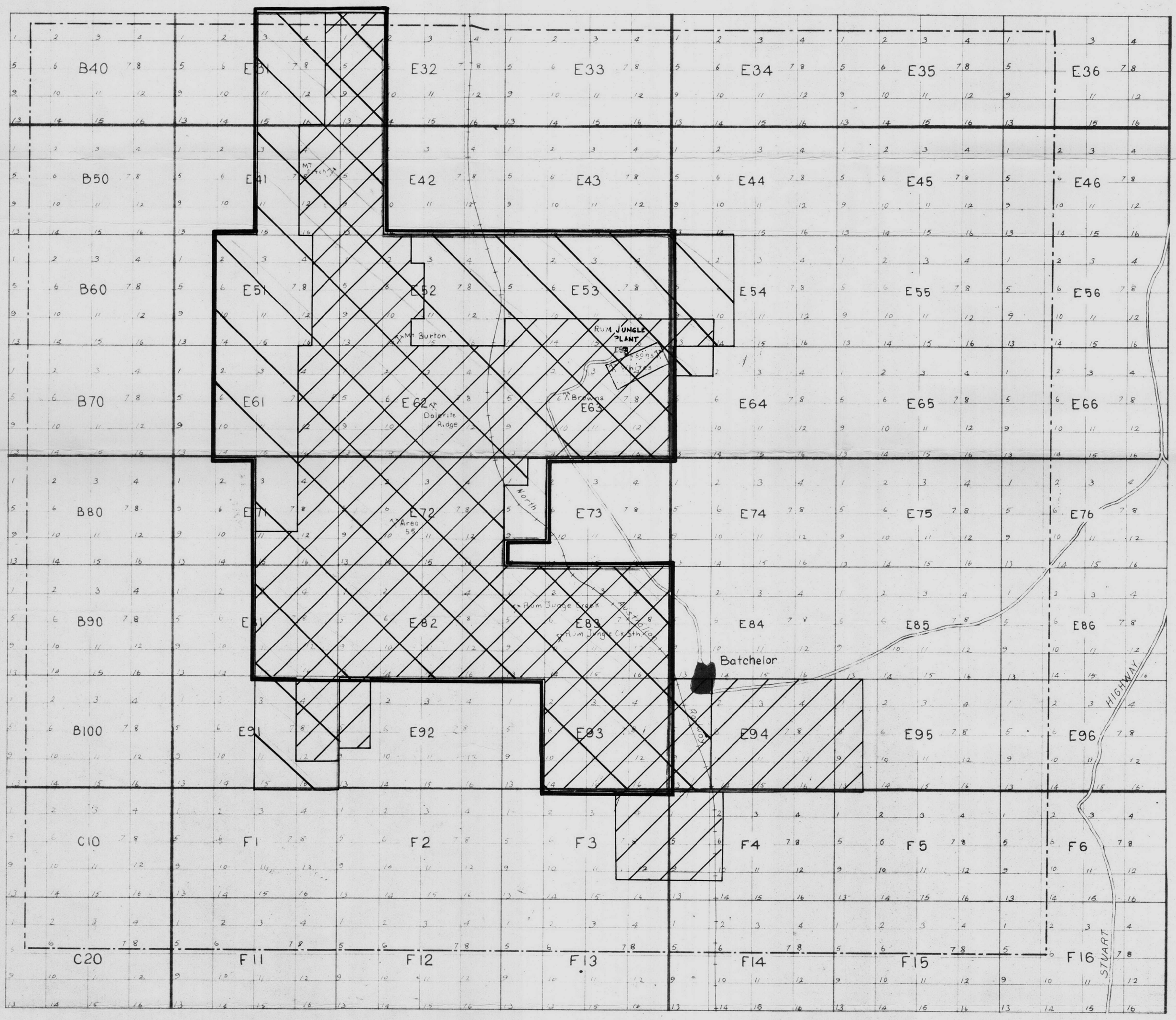
Fig. 1

RUM JUNGLE COMPILATION



SCALE : 1" = 1 mile

COMPILATION 1966-1967

- COMPILATION OF GEOLOGY
- COMPILATION OF GEOCHEMICAL AND SUBSURFACE RADIOMETRIC DATA.
- PRELIMINARY ASSESSMENT COMPLETED WITHIN THIS AREA.

COMPILATION 1968

- DETAILED COMPILATION

BUREAU OF MINERAL RESOURCES,
FEBRUARY 1968.

Record 1967/150

D52/A8/371

RUM JUNGLE DISTRICT

PLATE 1.

SHEET E31 Geology

Drawn by L. Kerec 1967

LOCATION DIAGRAM

B30	E21	E22
B40	E31	E32
B50	E41	E42

REFERENCE

MAJOR GRID T.E.P. mine grid, North 35° 58' 00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: D.O. Shatwell 1966.

Amended by: Y. Miezitis, July 1967.

Record 1967/150

LOWER PROTEROZOIC ? TERTIARY

fer. sd — ferruginised sediments (includes ferruginous breccia, ferricrete, laterite)

Elb — BURRELL CREEK FORMATION — *pale brown and purple (quartz, sericite, chloritic) slate and greywacke*

LOWER PROTEROZOIC

Eld — GOLDEN DYKE FORMATION — *b.s. — black carbonaceous and/or graphitic slate, schist; sil. b.s — silicified black slate; ser. s — sericitic slate, schist; chl. s — chloritic slate.*

Elo — COOMALIE DOLOMITE — *tremolite schist, tremolite chlorite schist, talc schist; dolomite, chert.*

SCALE

0 400 800 1600 Feet

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

B.M.R. survey

- 400 p.p.m. / 3200 p.p.m. Cu
- 400 p.p.m. Pb
- 200 p.p.m. Ni
- 200 p.p.m. Co
- 200 p.p.m. V
- 1012 units Radiometric contour

T.E.P. Ltd survey

- 400 p.p.m. Cu
- 400 p.p.m. Pb
- 400 p.p.m. Zn
- 200 p.p.m. Co
- 100 counts/sec Radiometric contour

Mapped outcrop and rock exposure

Vein quartz

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault

(Where location of boundaries and faults is approximate, line is broken, where inferred, queried.)

Strike and dip of bedding

Strike and dip of cleavage, schistosity.

Vertical cleavage

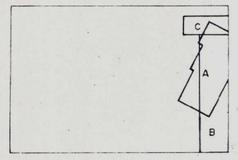
T.E.P. diamond drill hole showing direction and depression where hole is inclined.

B.M.R. Rotary drill hole

Bulldozed costean

Vehicle track

PEGGED GRIDS



A. MT. FITCH NORTH

B. MT. FITCH I

C. 1966 T.E.P. Ltd. Grid.

Compilation based on:

(1) T.E.P. Ltd geological data from diamond drill holes and costean mapping

(2) Pritchard and French 1963 survey, Mt. Fitch No1 grid, B.M.R. Record No. 1965/6.

(3) Spratt (T.E.P. Ltd.), 1965 survey, Mt. Fitch No 1 grid.

(4) Bertsmon (T.E.P. Ltd.), 1966 survey

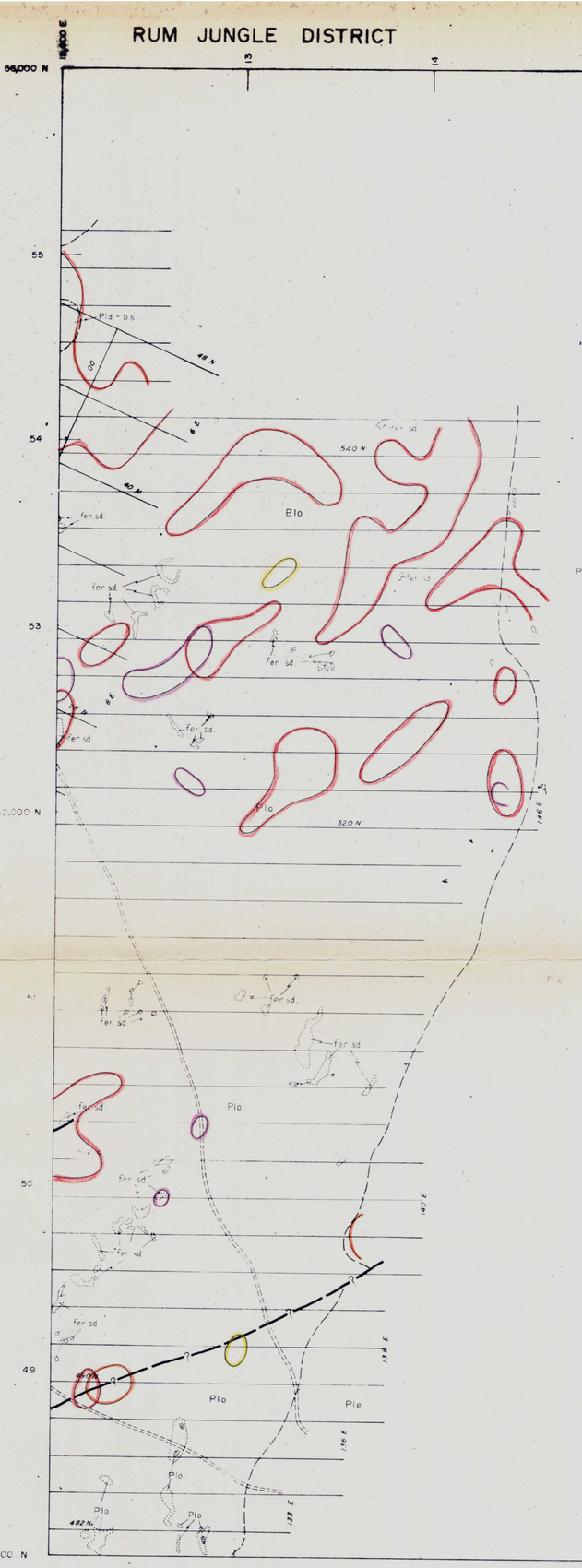
(5) Marjoribanks (T.E.P. Ltd.) 1966 survey, mapping west of Mt. Fitch No1 grid

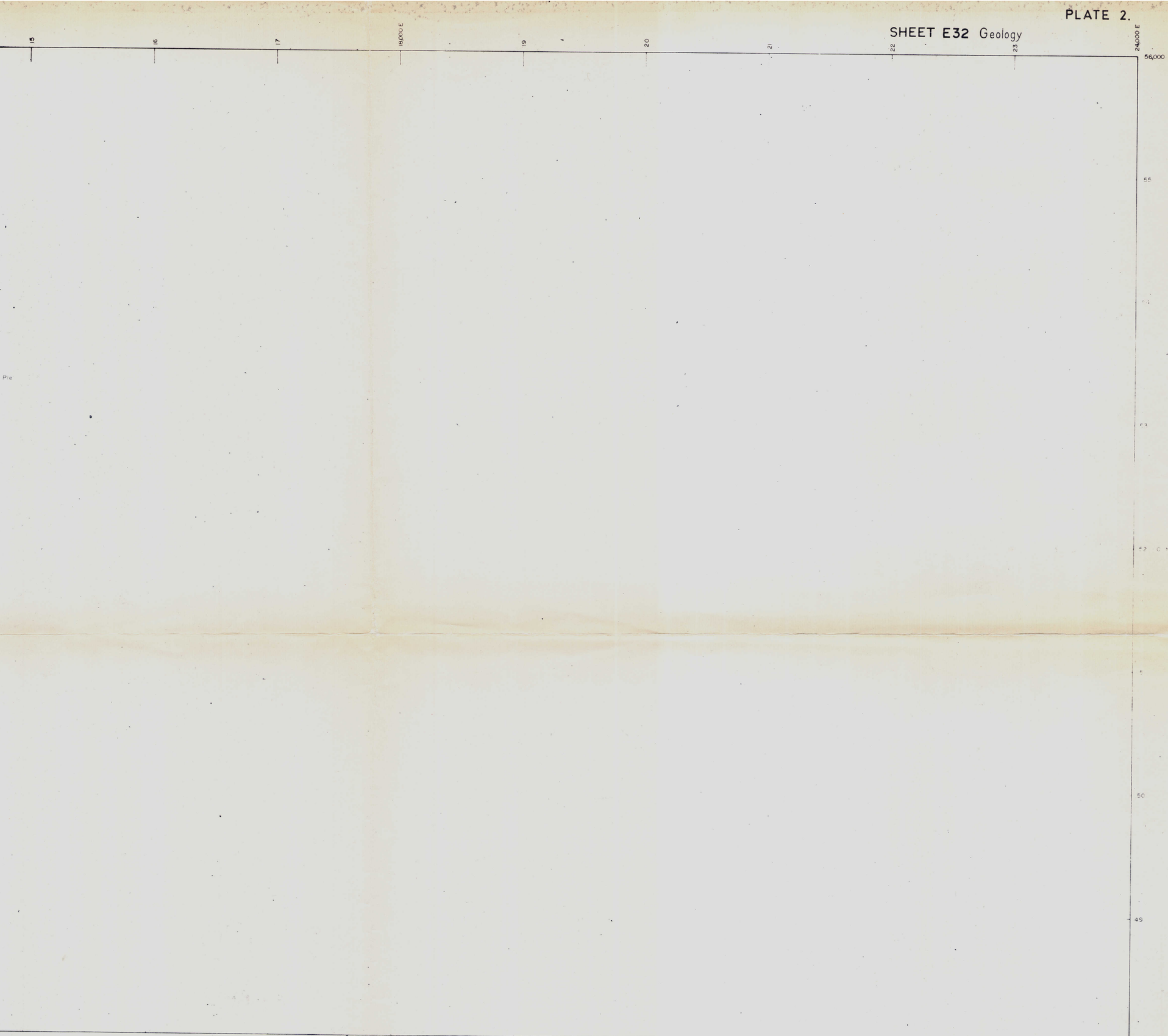
D52/A/153

PLATE 2.

RUM JUNGLE DISTRICT

SHEET E32 Geology





LOCATION DIAGRAM

E21	E22	E23
E31	E32	E33
E41	E42	E43

REFERENCE

MAJOR GRID: T.E.P. mine grid, North 35° 58' 00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: D.O. Shatwell 1966

Amended by: V. Miezitis July 1967

Record 1967/150

? TERTIARY

fer sd - ferruginised sediments (includes ferruginous breccia, ferricrete, laterite)

PROTEROZOIC

LOWER

GOLDEN DYKE FORMATION

Pld — b.s - black carbonaceous and/or graphitic slate, schist.

COOMALIE DOLOMITE

Plo — tremolite schist, tremolite chlorite schist, talc schist, dolomite, chert.

BEESTONS FORMATION

Ple — arkose schist, arkose conglomerate

SCALE

400 ft to 1"

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

B.M.R. survey

200 p.p.m. Ni

200 p.p.m. Co

200 p.p.m. V

012 units Radiometric contour

T.E.P. Ltd survey

100 counts/sec Radiometric contour

Mapped outcrop and rock exposure

Formation boundary

Stratigraphical boundary

Intrusive and dyke boundary

Fault

(Where location of boundaries and faults is approximate line is broken, where inferred queried.)

Strike and dip of bedding

Vehicle track

INDEX TO PLANS

A MT FITCH NORTH

B MT FITCH I.

C 1966 T.E.P. Ltd.

Compilation based on:

P. Pritchard and French, 1963 survey, Mount Fitch No 1 Grid, BMR Record No 1965/6

Spratt (T.E.P. Ltd) 1965 survey

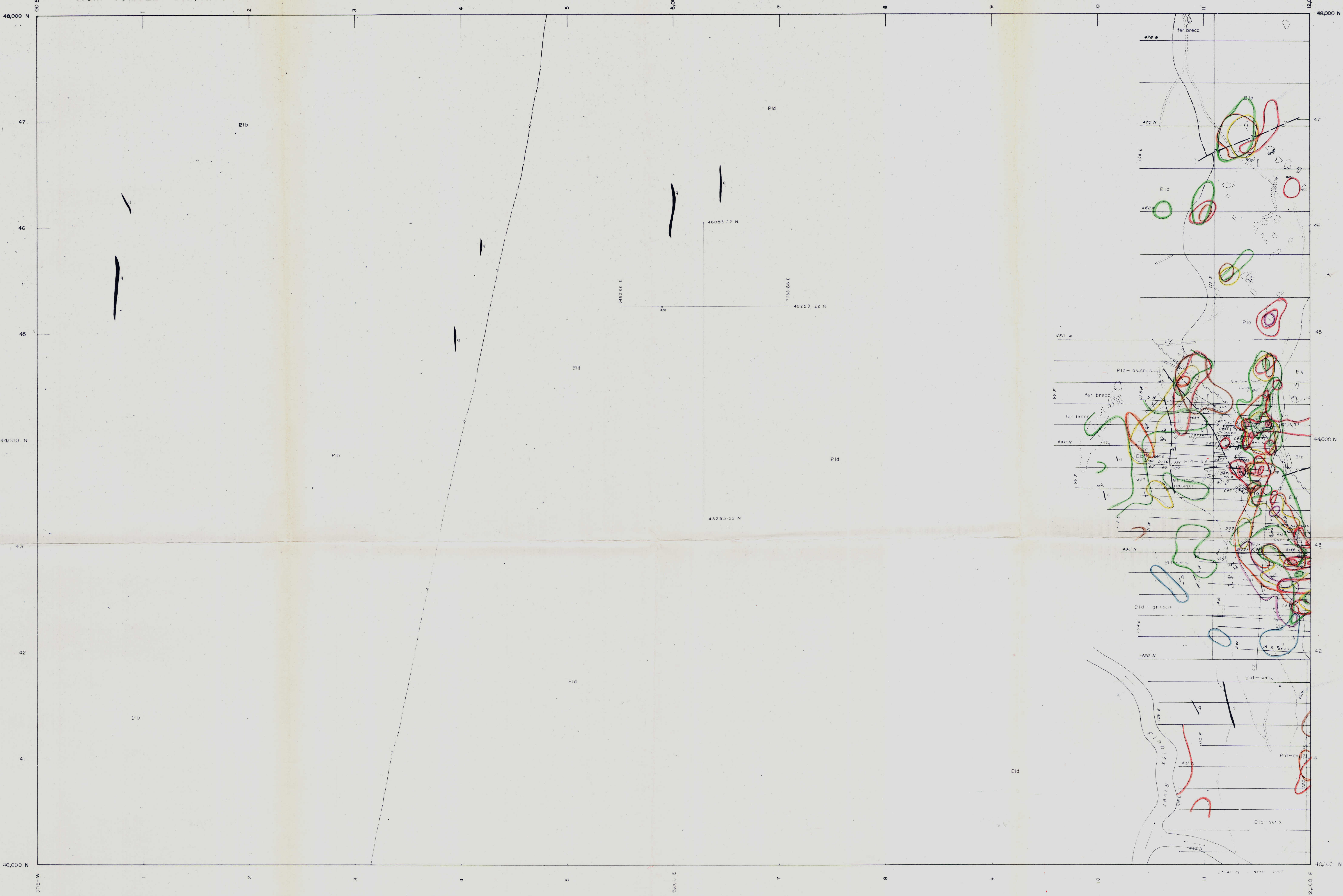
Berkman (T.E.P. Ltd.) 1966 survey

D 52/A/154

RUM JUNGLE DISTRICT

SHEET E41 Geology

PLATE 3a.



LOCATION DIAGRAM

B40	E31	E32
B50	E41	E42
B60	E51	E52

REFERENCE

MAJOR GRID: T.E.P. mine grid, North 359°58'00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: D.O. Shatwell 1966, Y. Miezitis March 1967

?TERTIARY

fer brecc — ferruginous breccia, mostly pisolitic (laterite)

LOWER PROTEROZOIC

Elb BURRELL CREEK FORMATION — *pale brown and purple (quartz, sericite, chlorite) slate and greywacke.*

LOWER PROTEROZOIC

Eld GOLDEN DYKE FORMATION — *bs — black carbonaceous and/or graphitic slate, schist; chl s — chloritic slate, schist; ser. s — sericitic slate, schist; grn sch — greenschist; am — amphibolite*

Elo COOMALIE DOLOMITE — *dolomite, chloritic dolomite, talc schist, calcareous shale, tremolitic schist*

Elr CRATER FORMATION — *quartz schist, quartz feldspar schist, hematite boulder conglomerate and schist*

Ele BEESTONS FORMATION — *arkose schist, arkose conglomerate*

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

Survey	Value	Element
BMR survey	400 ppm	Cu
	3200 ppm	
	400 ppm	Pb
	200 ppm	Ni
	200 ppm	[illegible]
	200 ppm	[illegible]
	40 ppm	Mo
	·036 units	Radiometric contours
	·072 units	
T.E.P. Ltd survey	200 ppm	Ni
	40 ppm	Mo
	50 units	Radiometric contour

•450 Zn Spot value

Mapped outcrop and rock exposure

Gossan

Vein quartz

Quartz rubble

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Shear zone

Fault

Axis of anticline

(Where location of boundaries, folds and faults is approximate, line is broken; where inferred, queried)

Strike and dip of bedding

Strike and dip of cleavage, schistosity

Vertical cleavage

T.E.P. diamond drill hole showing direction and depression where hole is inclined

A.M.&S. diamond drill hole

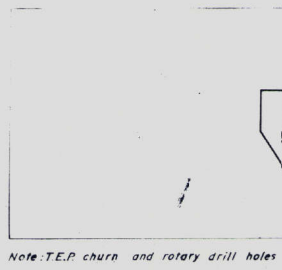
B.M.R. diamond drill hole

Rotary drill hole (B.M.R.)

Shaft

Bulldozed costean

Vehicle track



A. MT. FITCH I

B. MT. FITCH AREA

Note: T.E.P. churn and rotary drill holes not shown

Compilation based on:

(1) Ward 1949–1950 Mount Fitch Prospect mapping, B.M.R. Record No 1953/140

(2) T.E.P. Ltd geological data from diamond, churn and rotary drill holes.

(3) Pritchard and French 1963 survey, Mt. Fitch No 1 grid B.M.R. Record No 1965/6.

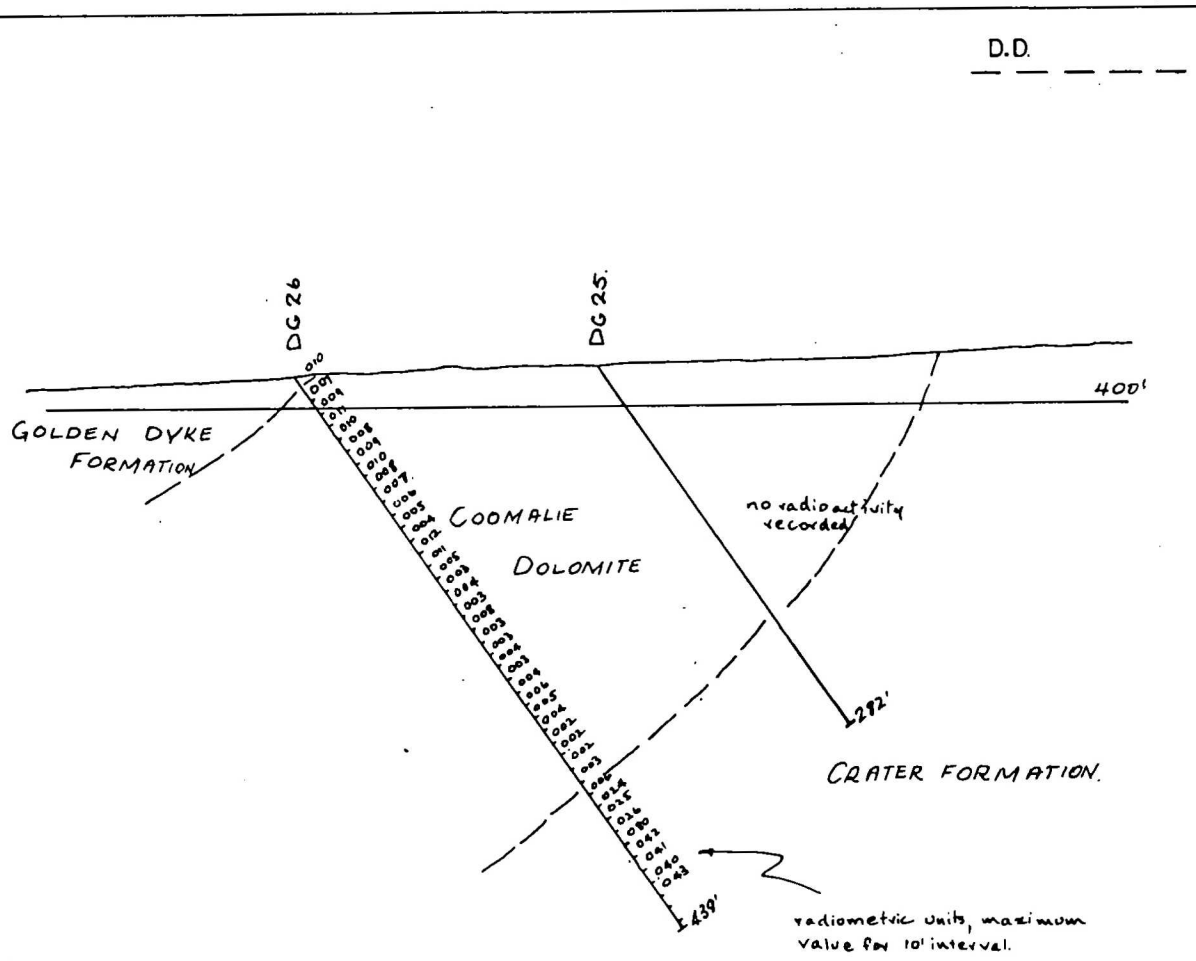
(4) Spratt (T.E.P. Ltd) 1965 survey, Mount Fitch No 1 grid

(5) Marjoribanks (T.E.P. Ltd) 1966 mapping west of Mount Fitch No 1 grid.

Record 1967/150

D52/A/155

PLATE 3.6

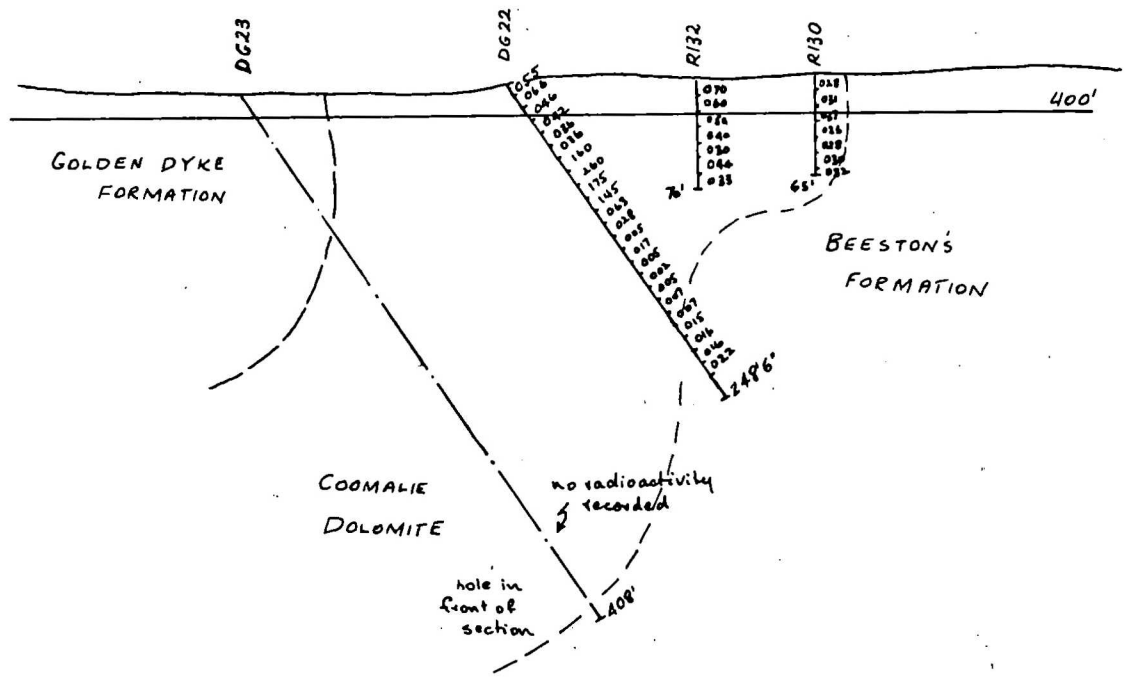


SHEET E41, E42.	SCALE 0 100FT
CO-ORDINATES N 42510 E11880 Mt FITCH NO1 LOCAL GRID.	BEARING OF SECTION 65°T LOOKING NW.
	DEPRESSION

Record 1967/150

D52/A/184

D.D.



SHEET E41	0 SCALE 100FT
CO-ORDINATES N 44200 E 11500 MOUNT FITCH No1 LOCAL GRID	BEARING OF SECTION 90°T LOOKING N.
	DEPRESSION

Record 1967/150

D52/A/185

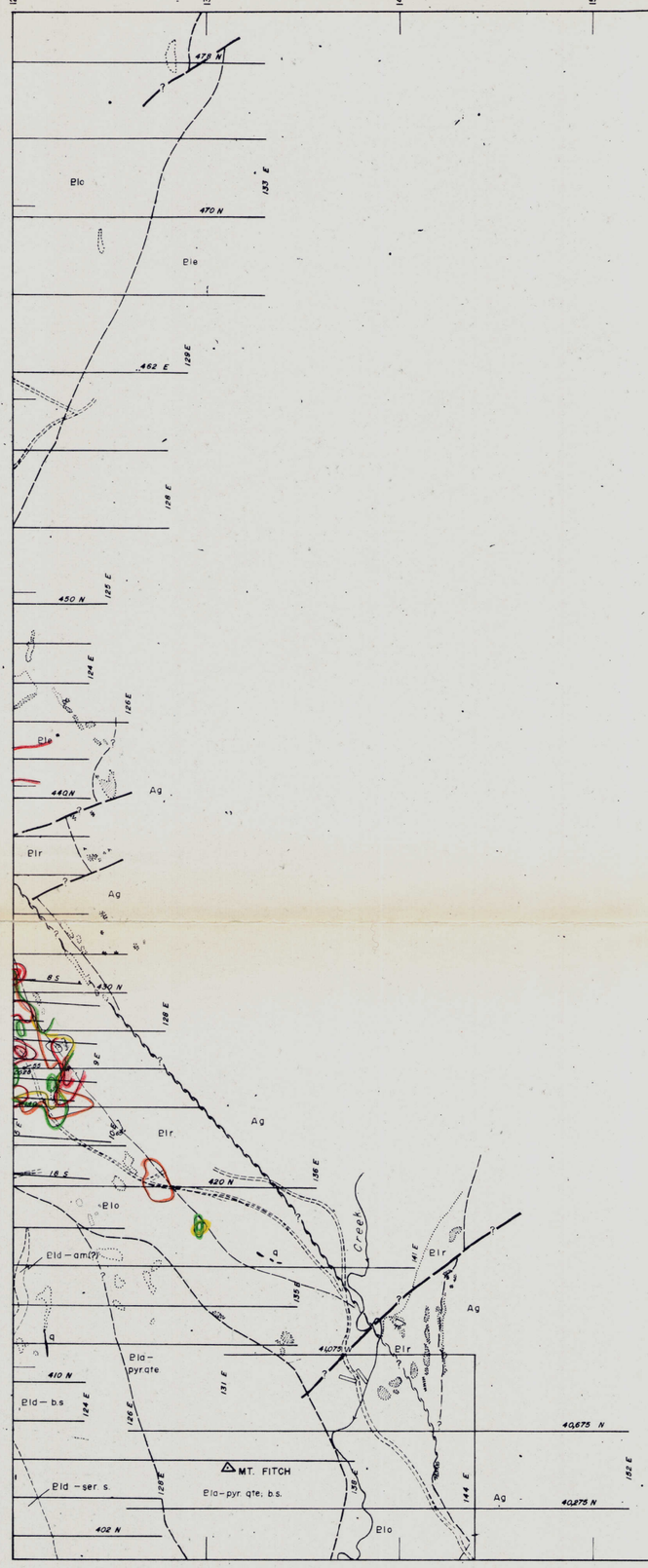
PLATE 4.

RUM JUNGLE DISTRICT

SHEET E 42 Geology

12,000 E 13 14 15 16 17 18,000 E 19 20 21 22 23 24,000 E

48,000 N 47 46 45 44,000 N 43 42 41 40,000 N



LOCATION DIAGRAM

E31	E32	E33
E41	E42	E43
E51	E52	E53

REFERENCE

MAJOR GRID T.E.P. mine grid, North 359°58'00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: D.O.Shatwell 1966

Record 1967/150

PROTEROZOIC

LOWER

GÖLDEN DYKE FORMATION
Eld — *b.s — black carbonaceous and/or graphitic slate, schist; ser.s. — sericite slate, schist; am. — amphibolite*

MASSON FORMATION
ACACIA GAP TONGUE
Elc — *pyr. qte — pyritic quartzite; b.s — black carbonaceous and/or graphitic slate, schist*

COOMALIE DOLOMITE
Elo — *dolomite, chloritic dolomite, talc schist, calcareous shale, tremolitic schist, sandstone, pink quartzite, pink quartzite breccia, quartz hematite breccia*

CRATER FORMATION
Elr — *quartz schist, quartz feldspar schist, hematite boulder conglomerate and schist*

BEESTONS FORMATION
Ele — *arkose schist, arkose conglomerate*

ARCHAEAN

RUM JUNGLE COMPLEX
Ag — *granite, gneiss*

SCALE
400 0 400 800 1200 Feet
400 ft to 1 inch

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

B.M.R. survey

400 ppm Cu
3200 ppm Cu
200 ppm Co
200 ppm Ni
036 / 072 units Radiometric contours

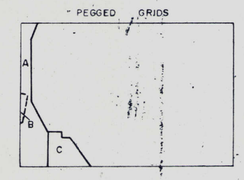
Mapped outcrop and rock exposure

Gossan

q *Vein quartz*

Formation boundary
Lithological boundary
Outcrop and rubble boundary
Shear zone
Fault
(Where location of boundaries and faults is approximate, line is broken, where inferred, queried)
Strike and dip of cleavage, schistosity
D.D.H. 25 0–55° *B.M.R. diamond drill hole*
08/40 *Rotary drill hole (B.M.R.)*
Bulldozed costean
Vehicle track
Trig station

PEGGED GRIDS



A. MT. FITCH 1
B. MT. FITCH AREA
C. MT. FITCH 2

Drawn by L. Kerec 1967

Compilation based on:
(1) T.E.P. geological data from diamond and churn drill holes
(2) Pritchard and French 1963 survey, Mount Fitch No.1 grid, Mt Fitch No.2 grid, B.M.R. Record No. 1965/6.
(3) Spratt (T.E.P. Ltd), 1965 survey, Mount Fitch No.1 grid.

Note: T.E.P. churn and rotary drill holes not shown.

D 52/A/156

PLATE 5.

RUM JUNGLE DISTRICT

SHEET E51 Geology

Elb

Eld

Eld – am.

Eld – ser. sch.

Eld – biot. ser. sch; chl. ser. sch; am.

Eld (?) – fer. s.lt.

Eld – biot. ser. sch; chl. ser. sch; am.

Billabong

East Finnis River

Finnis River

q

LOCATION DIAGRAM

B 50	E 41	E 42
B 60	E 51	E 52
B 70	E 61	E 62

REFERENCE

LOWER PROTEROZOIC

Elb — BURRELL CREEK FORMATION
pale brown and purple (quartz, sericite, chlorite) slate and greywacke.

Eld — GOLDEN DYKE FORMATION
ser. sch. – sericite slate, schist; biot. ser. sch. – biotite sericite schist; chl. ser. sch; chlorite sericite schist; fer. s.lt. – ferruginous siltstone; am – amphibolite

SCALE
400 0 400 800 1200 Feet
400 ft to 1 inch

SUBSURFACE RADIOMETRIC ANOMALIES
·036 units — Radiometric contours
Auger hole where radiometric value increases with depth (Maximum value shown at hole locality)

Vein quartz

Quartz rubble

Formation boundary
Lithological boundary
Outcrop and rubble boundary
(Where location of boundaries is approximate line is broken, where inferred, queried.)

PEGGED GRIDS
A. MT. FITCH
B. TRIANGLE AREA

Compilation based on:
(1) Dodson and Shatwell, Triangle Area 1964 survey, B.M.R. Record 1965/234.
(2) Sprott (T.E.P. Ltd.), Mt. Fitch No. 1 grid.
(3) Marjorbanks (T.E.P. Ltd.) mapping west of Triangle Area 1966 survey.

MAJOR GRID T.E.P. mine grid, North 359°58'00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: D.D. Shatwell 1966, Y. Miezitis March 1967.

Drawn by L. Kerec 1967

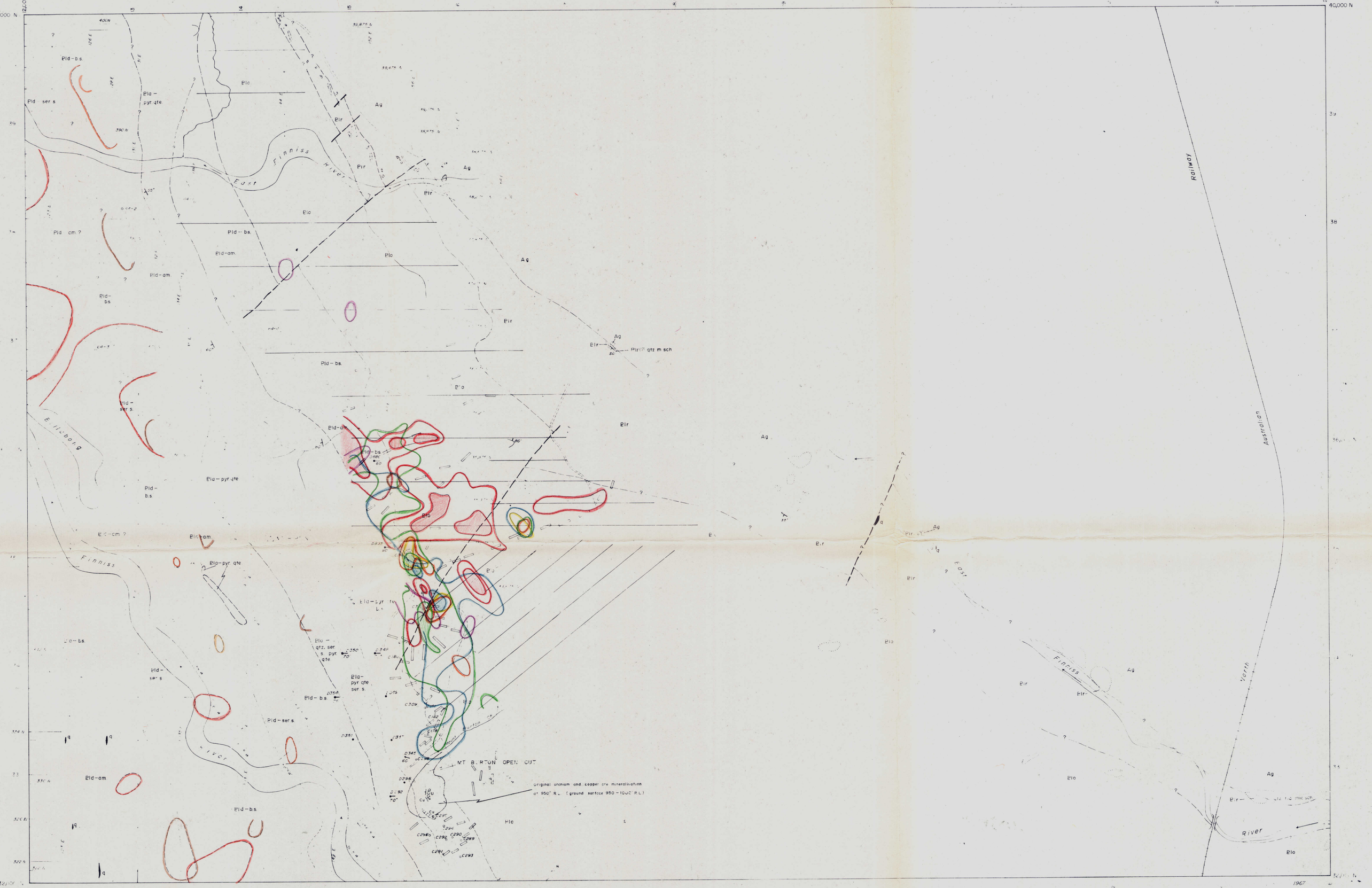
Record 1967/150

D 52/A/157

PLATE 6a

RUM JUNGLE DISTRICT

SHEET E52 Geology



E41 E42 E43
E51 E52 E53
E61 E62 E63

REFERENCE

Compiled by: D.O. Shotwell 1966

Amended by: Y. Miezitis January 1967

Record 1967/150

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION — Pld — *b.s. – black carbonaceous and/or graphitic shale, slate, schist, chls – chloritic schist, slate, ser – sericitic schist, slate; qtz – quartz, qte – quartzite; am. – amphibolite*

MASSON FORMATION — Pla
ACACIA GAP TONGUE
pyr. qte – pyritic quartzite; b.s. – black shale, gy.s. – grey slate, ser s – sericitic slate, schist

COOMALIE DOLOMITE — Plo
dolomite, tremolitic schist, chloritic, calcsilicate, dolomitic schist, sandstone

CRATER FORMATION — Plr
arkose, hematitic, boulder conglomerate, quartz tourmaline rocks, qtz. m. sch – quartz mica schist

UNDIFFERENTIATED
qtz. feld m. sch – quartz feldspar mica schist

ARCHAEAN

RUM JUNGLE COMPLEX — Ag
Undifferentiated granite, gneiss

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

B.M.R. survey

400 p.p.m. / 3200 p.p.m.	Cu
400 p.p.m. / 3200 p.p.m.	Pb
200 p.p.m.	Ni
200 p.p.m.	Co
200 p.p.m.	V
40 p.p.m.	Mo
036 / 072 units	Radiometric contours

T.E.P. Ltd survey

200 p.p.m.	Ni
400 p.p.m.	Mo
40 p.p.m.	Mo
400 p.p.m.	Zn
20 units	Radiometric contour

Mapped outcrop and rock exposure

Uranium and copper mineralisation

Vein quartz

Formation boundary

Stratigraphical boundary

Outcrop and rubble boundary

Fault

Where location of boundaries and faults is approximate, line is broken, where inferred, queried.

Dip and strike of bedding

Dip and strike of foliation

T.E.P. diamond drill hole, showing direction and depression where hole is inclined

B.M.R. diamond drill hole

T.E.P. churn drill hole

Open cut boundary

Bulldozed costean

Vehicle track

A. MT. FITCH

B. MT. FITCH 2

C. DOLERITE RIDGE EXT.

D. TRIANGLE AREA

Note. Diamond and churn drill holes within the open cut not known

E. AIR PHOTO MAPPING

Compilation based on

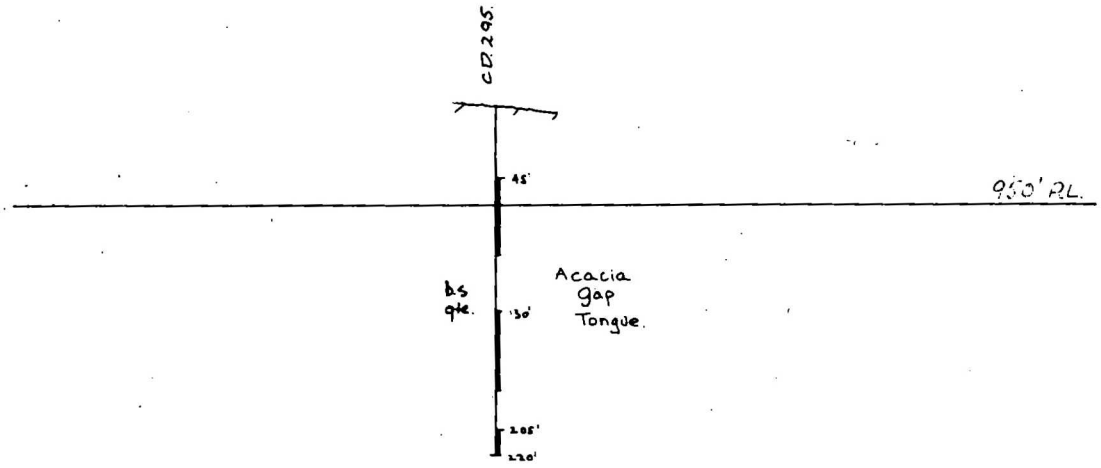
(1) T.E.P. Ltd geological data from diamond and churn drill holes, field mapping, Mt Burton open cut plans.

(2) Pritchard and French 1963 survey, BMR Record No 1965/6.

(3) Sprott (T.E.P. Ltd.) 1965 survey, Mount Fitch No 1 grid and Dolerite Ridge extended grid.

D52/A/158

C.D. 295.



CD. 295

From	To	Cu %
45'	95'	50 × 5.6

		U_3O_8 lbs/ton
130'	180'	50' × 1.21
205'	220'	15' × 0.55

SHEET E 52	0 SCALE 100 FT
CO-ORDINATES N 32587 E 15735' MINE GRID	BEARING OF SECTION LOOKING 55° NW.
	DEPRESSION Vertical

15500E.

PLATE 6. c.

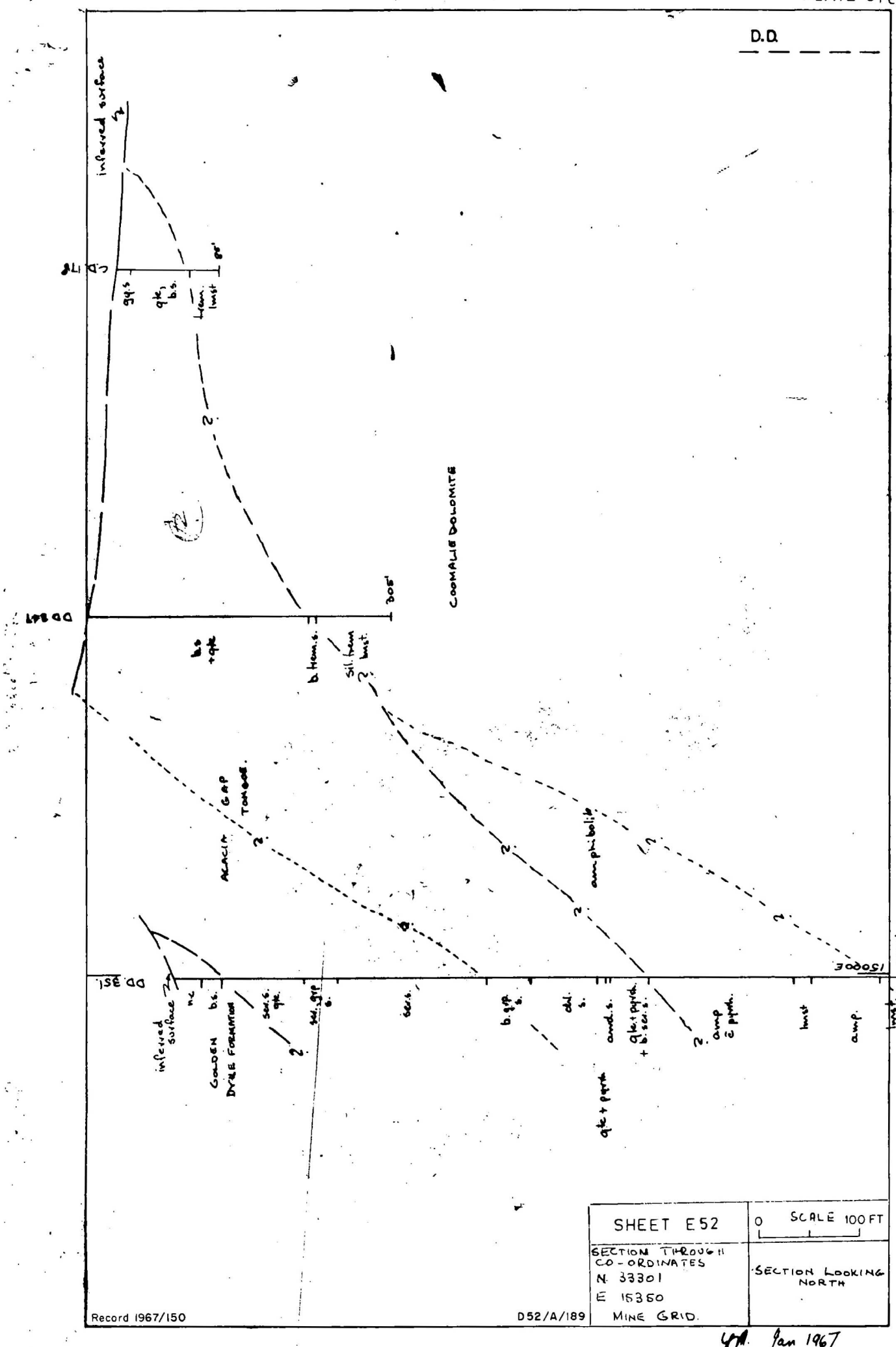
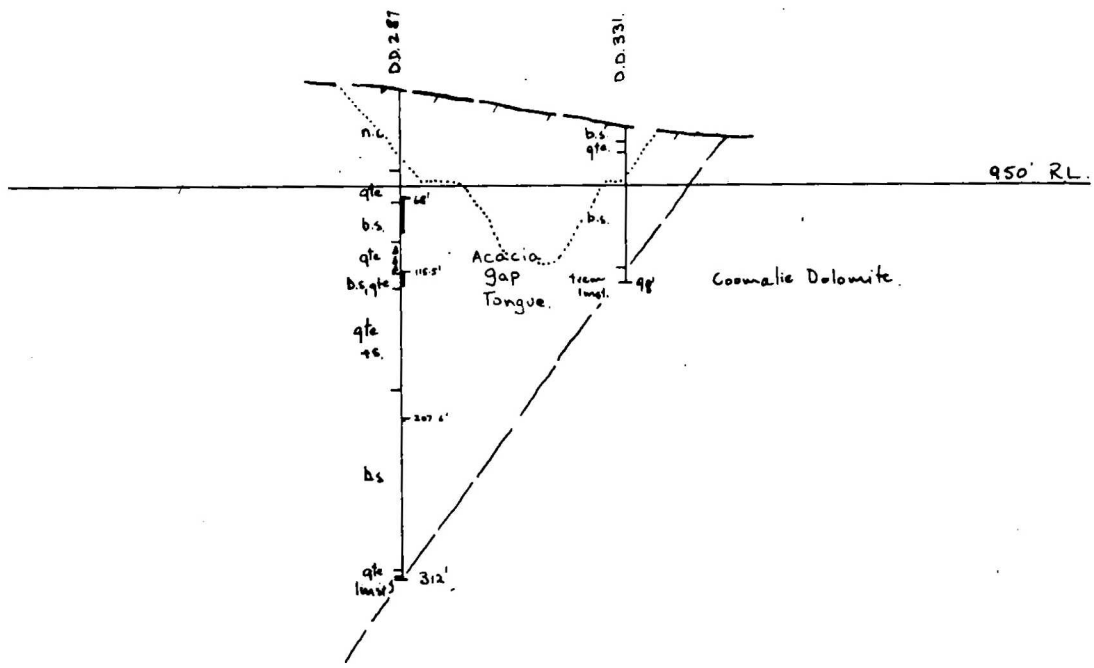

D.D.
inferred surface
COONALIE DOLOMITE
ACACIA GAP TONGUE
amphibolite
GOLDEN DYKE FORMATION
inferred surface
qtz + pyrite
amp & pyrite
SHEET E52
SECTION THROUGH CO-ORDINATES
N 33301
E 15360
MINE GRID.
SCALE 100 FT
SECTION LOOKING NORTH
Record 1967/150
D52/A/189
Jan 1967

PLATE 6

D.D.s 287, 331.



DD.287

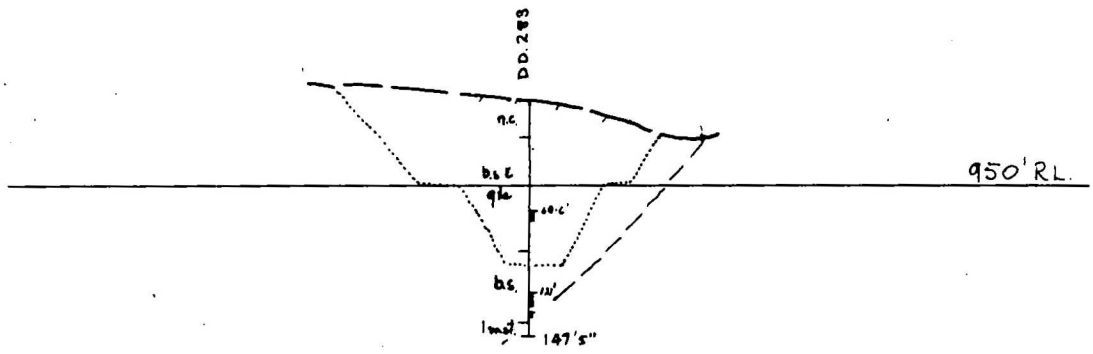
From	To	Cu%
68.0'	- 90.0'	22.0' x 3.2
115.5'	- 124.0'	8.5' x 2.6
		U_3O_8 lbs/ton
207.6'	- 209.0'	1.4' x 1.5.

SHEET E 52	0 SCALE 100 FT
CO-ORDINATES N 32684 E 15758 MINE GRID	BEARING OF SECTION 64° T LOOKING N.W.
	DEPRESSION

15300E.

PLATE 6 e.

D.D. 283



DD.283

From	To	Cu%
69.6'	75.0'	7.8
133.5'	135.5'	3.5
		U3O8 lbs/ton
121.0'	129.5'	1.1

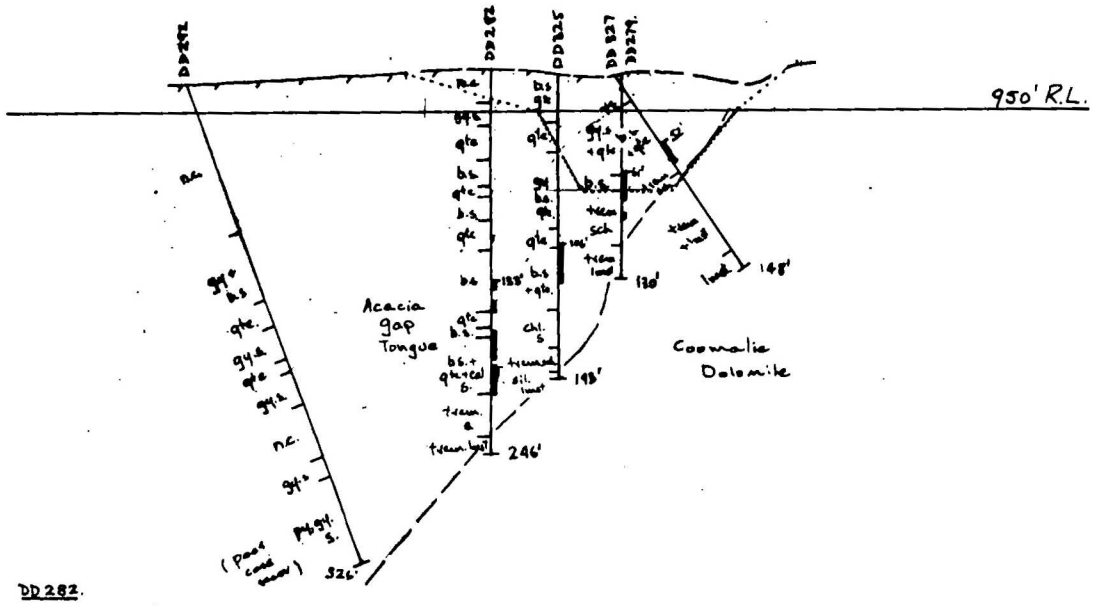
SHEET E 52	SCALE 0 100 FT
CO-ORDINATES N 32688 E 15684 MINE GRID	BEARING OF SECTION 64°T LOOKINK NW
	DEPRESSION —

15300 E.

Record 1967/150

D 52/A/190

D.D.



DD 282.

From	To	U_3O_8 lbs/ton.
133·0"	139'3"	6·3 × 1·8
147·8	156·0	6·2 × 1·0
166·8	175·4	10·1 × 1·7
177·0	183·0	6·0 × 1·5
187·8	206·0	18·2 × 1·2

DD 325

From	To	U_3O_8 lbs/ton
106'0"	131'6"	25'6" × 1·1

D.D. 327.

From	To	U_3O_8 lbs/ton
52·0"	67'0"	15'0" × 4·4

DD. 279

From	To	U_3O_8 lbs/ton
41·0"	80·0"	19·0" × 7·1
88·0"	92·0"	4·0" × 1·7

SHEET E 52	0 SCALE 100 FT
CO-ORDINATES N 32790 E 15544 MINE GRID	BEARING OF SECTION 88° LOOKING NW.
	DEPRESSION

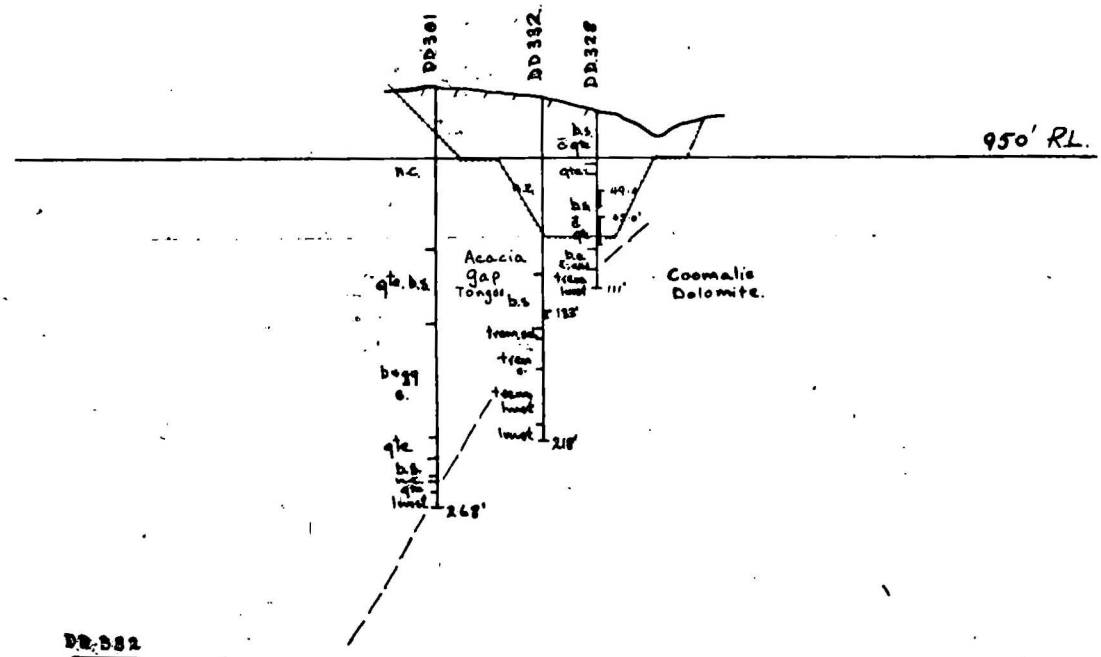
15500E.

Record 1967/150

D 52 /A/191

PLATE 6

D.D.'s 301, 328, 332.



DD.332

From	To	U_3O_8 lbs/ton
133'	138'	5' x 0.9

DD.328

From	To	U_3O_8 lbs/ton	Cu%
65.0'	84.3'	19.3 x 11.1	
49.4	60.5	11.1 x 3.1	

SHEET E52	0 SCALE 100FT
CO-ORDINATES N 32738 E 15632 MINE GRID.	BEARING OF SECTION 62°T LOOKING NW.
	DEPRESSION /

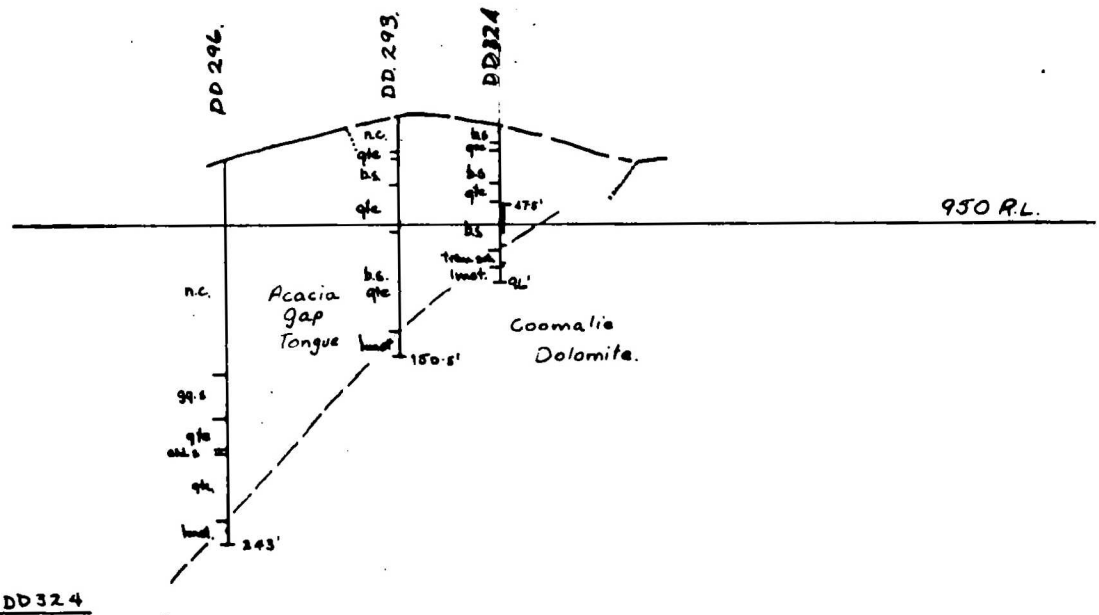
155 00E

Record 1967/150

D 52/A/192

PLATE 6

D.D.'s 293, 296, 324.



DD324

From	To	U_3O_8 lbs/ton
47·5'	66·0'	2·9
75·0	77·0	4·6
85·0	89·0	4·1

1/1000

SHEET E 52	0 SCALE 100 FT
CO-ORDINATES N 32849 E 15644 MINE GRID.	BEARING OF SECTION 121° T LOOKING NE.
	DEPRESSION —

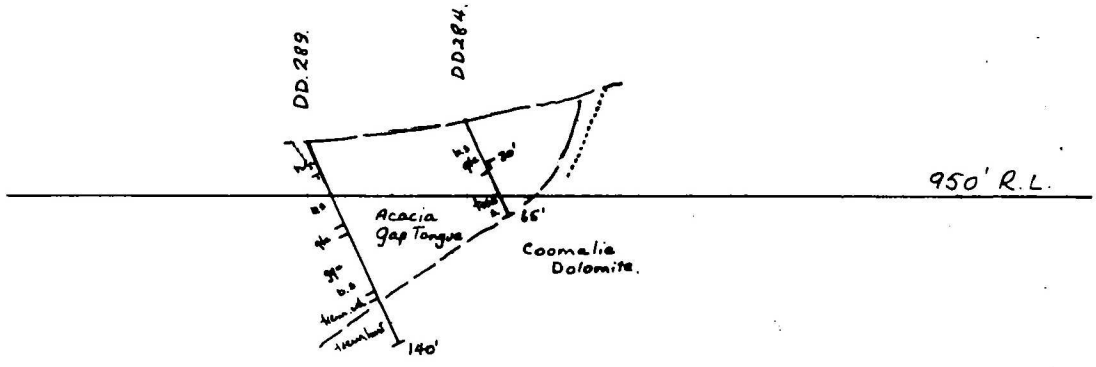
Record 1967/150

D52/A/193

JM. Sept. 67

PLATE 6.

D.D.'s 284, 289.



DD.284

From	To	U_3O_8 lbs/ton
30'	35'	4.0

15000E.

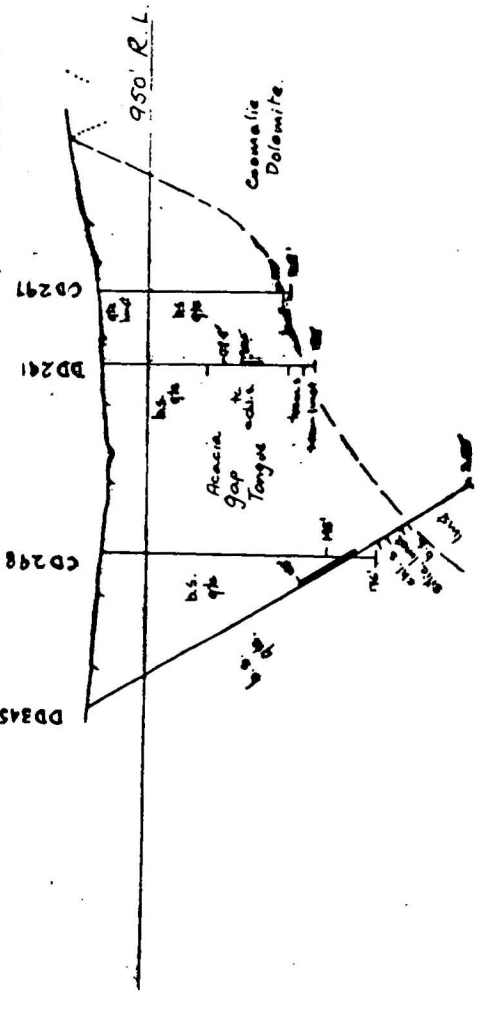
SHEET E 52	SCALE 0 100FT
CO-ORDINATES N 32970 E 15620 MINE GRID	BEARING OF SECTION 139° T LOOKING NE.
	DEPRESSION /

Record 1967/150

D 52/A/194

D.D.

300091



CD. 297

From	To	U_3O_8 lbs/ton
115'	120'	1·3

CD. 298'

From	To	lbs U_3O_8 /ton
145'	150'	0·53
150	155	0·43
155	160	0·46
160	165	0·66
165	170	0·41
170	175	0·74

DD 241

From	To	U_3O_8 lbs/ton	Cu%
90·5'	105'	14·5 x 2·2	
74·8'	82·8'	1·3	

DD345

From	To	lbs U_3O_8 /ton
158'	161'	0·45
161	164	1·10
164	167	1·32
167	170·5	2·34
170·5	174	0·82
174	176	0·95
176	178	2·80
178	181	1·72
181	182	1·08
182	182·75	3·74
182·75	185	0·85
185	187	2·49
187	189	4·20
189	193·2	2·47
193·2	195	0·64
195	197	1·24
197	200	0·64

SHEET E 52	SCALE 0 100FT
CO-ORDINATES N 33142 E 15485 MINE GRID	BEARING OF SECTION 104° T LOOKING NE
	DEPRESSION

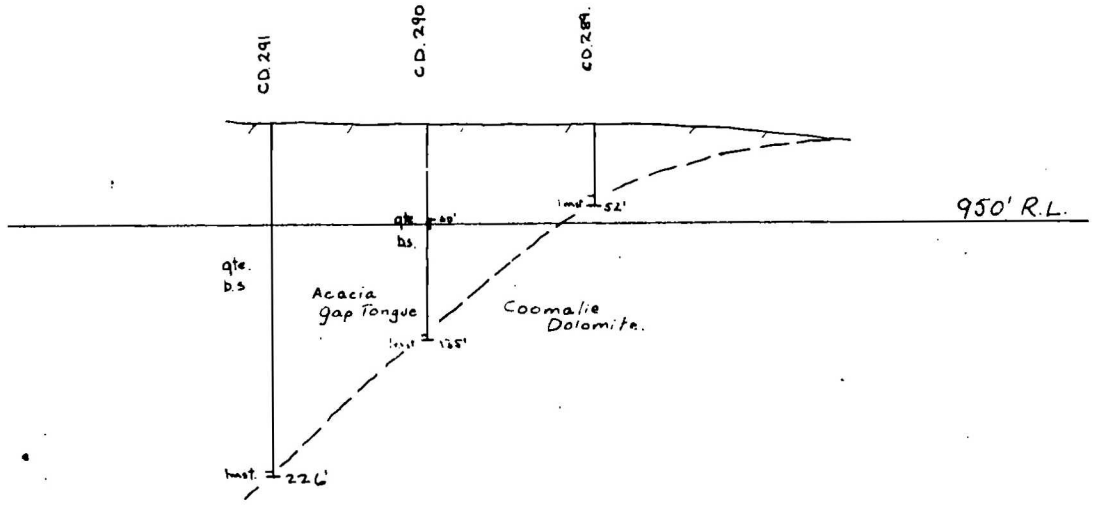
Record 1967/150

D 52/A/195

GM. Jan 1967

PLATE 6 L

C.D's 289, 290, 291.



C.D. 290

From	To	Cu%
60'-	65'	0.6

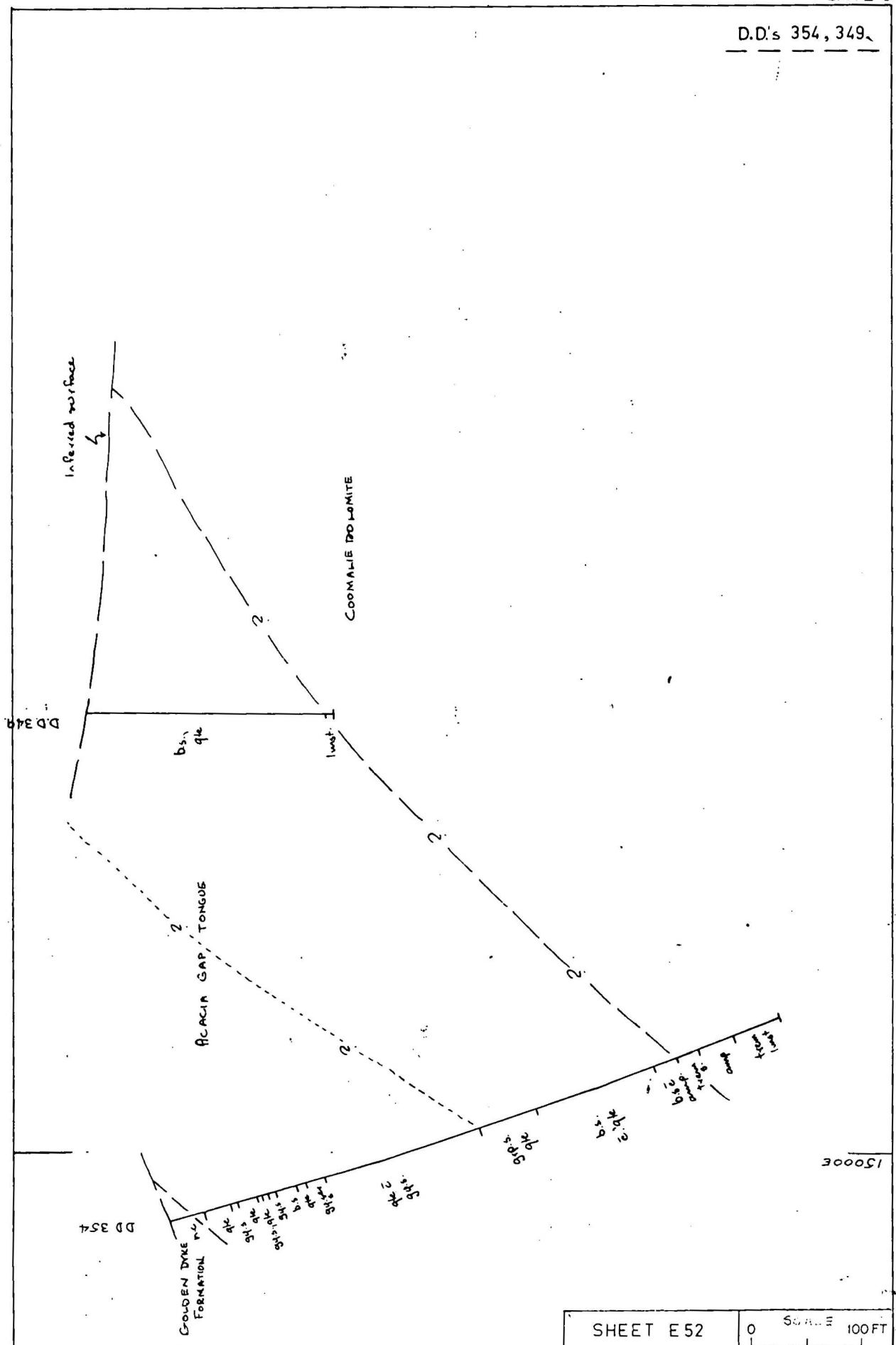
SHEET E52	SCALE 0 100 FT
CO-ORDINATES N 32249 E 15825 MINE GRID	BEARING OF SECTION 55° LOOKING N.W.
	DEPRESSION —

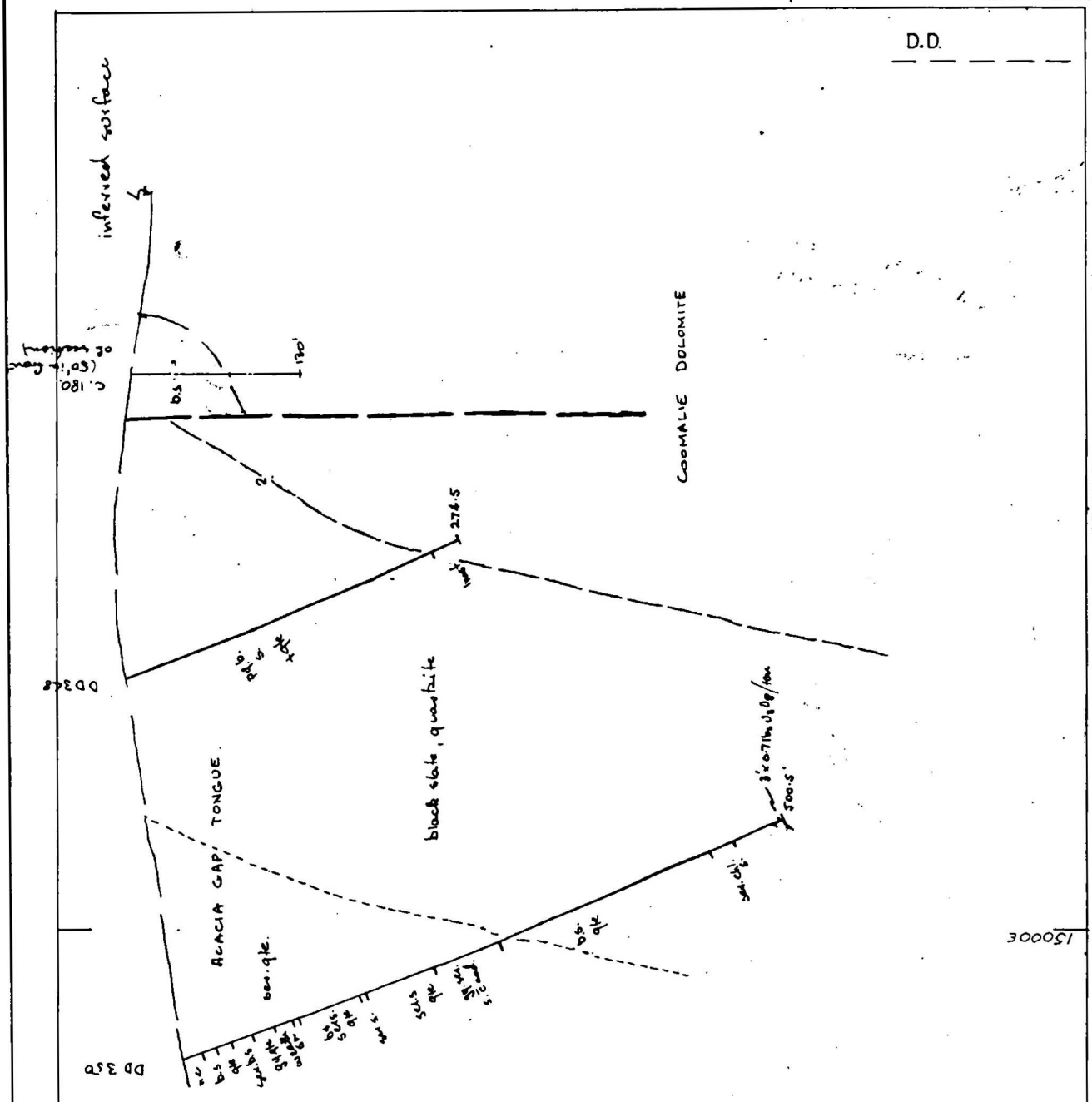
160 00E

Record 1967/150

D 52/A/186

PLATE 6m


D.D.'s 354, 349
Inferred surface
COOMALIE DOLOMITE
ACACIA GAP TONGUE
GOLDEN DYKE FORMATION
300051
SHEET E 52
SECTION THROUGH CO-ORDINATES
N 33701
E 15300
MINE GRID
SECTION LOOKING NORTH
0 SCALE 100 FT
Record 1967/150
D52/A/196



SHEET E52	SCALE 0 100 FT
SECTION THROUGH CO-ORDINATES N 34099 E 15201 (MINE GRID)	BEARING SECTION LOOKING NORTH. DEPRESSION

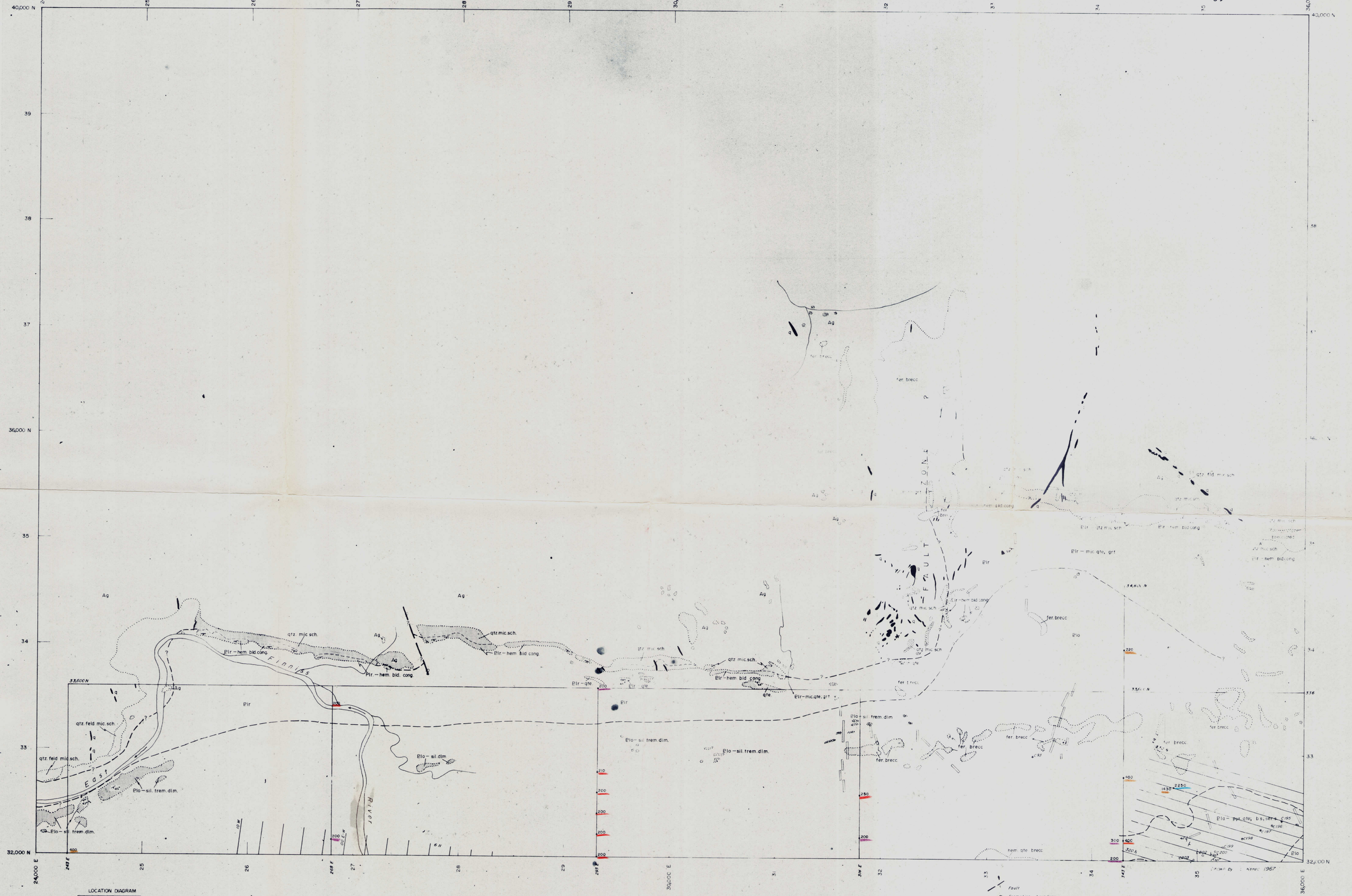
Record 1967/150

D 52/A/197

RUM JUNGLE DISTRICT

PLATE 7.

SHEET E53 Geology



LOCATION DIAGRAM

E42	E43	E44
E52	E53	E54
E62	E63	E64

REFERENCE

MAJOR GRID T.E.P. mine grid, North 359°58'00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: Y. Miezitis October 1966.

Record 1967/150

? LOWER PROTEROZOIC . ? TERTIARY

fer. brecc. – ferruginous breccia and ferruginised sediments

hem. qte. brecc. – hematitic quartzite breccia

LOWER PROTEROZOIC

MASSON FORMATION

ACACIA GAP TONGUE

Plo — b.s. – black carbonaceous and/or graphitic slate; pyr.qte. – pyritic quartzite; ser.s. – sericitic slate.

COOMALIE DOLOMITE

Plo — sil. trem. dlm. – silicified tremolitic dolomite. Undifferentiated dolomite, tremolitic dolomite, mudstones, chloritic slates

CRATER FORMATION

Plr — qtz. mic. sch – quartz mica schist; hem. bid. cong – hematitic 'boulder' conglomerate; mic. qte – micaceous quartzite; grt. – grit

UNDIFFERENTIATED

qtz. mic. sch – quartz mica schist; qtz. feld. mic. sch – quartz feldspar mica schist

ARCHAEAN

Ag — RUM JUNGLE COMPLEX

Undifferentiated granite, gneiss

SCALE

4 0 400 800 1200 Feet

400 ft. to 1 inch

Mapped outcrop and rock exposure

Vein quartz

Fault

Formation boundary

Lithological boundary

Outcrop and rubble boundary

(Where location of boundaries by faults – approximate line is broken; where inferred, queried)

Strike and dip of bedding

Strike and dip of cleavage schistosity

T.E.P. Churn drill hole

Bulldozed costean

ANOMALOUS GEOCHEMICAL AND SUBSURFACE RADIOMETRIC SPOT VALUES

TEP Ltd Survey

- + 400 ppm Pb
- + 400 ppm Zn
- + 200 ppm Ni
- + [illegible] ppm V
- + 200 cts/min radiometric

PEGGED GRIDS

A. EMBAYMENT AUGER DRILLING

B. BUCKSHEE & POWERPLANT

C. DYSONS NORTH

Compilation based on:

(1) MacKay Gates and Carter 1950–1951 mapping (B.M.R. map N.T. 47G-2)

(2) T.E.P. Ltd geological data from churn drill holes.

(3) Spratt (T.E.P. Ltd) Embayment North 1964 survey.

(4) Berkman (T.E.P. Ltd) Dysons North, 1966 survey.

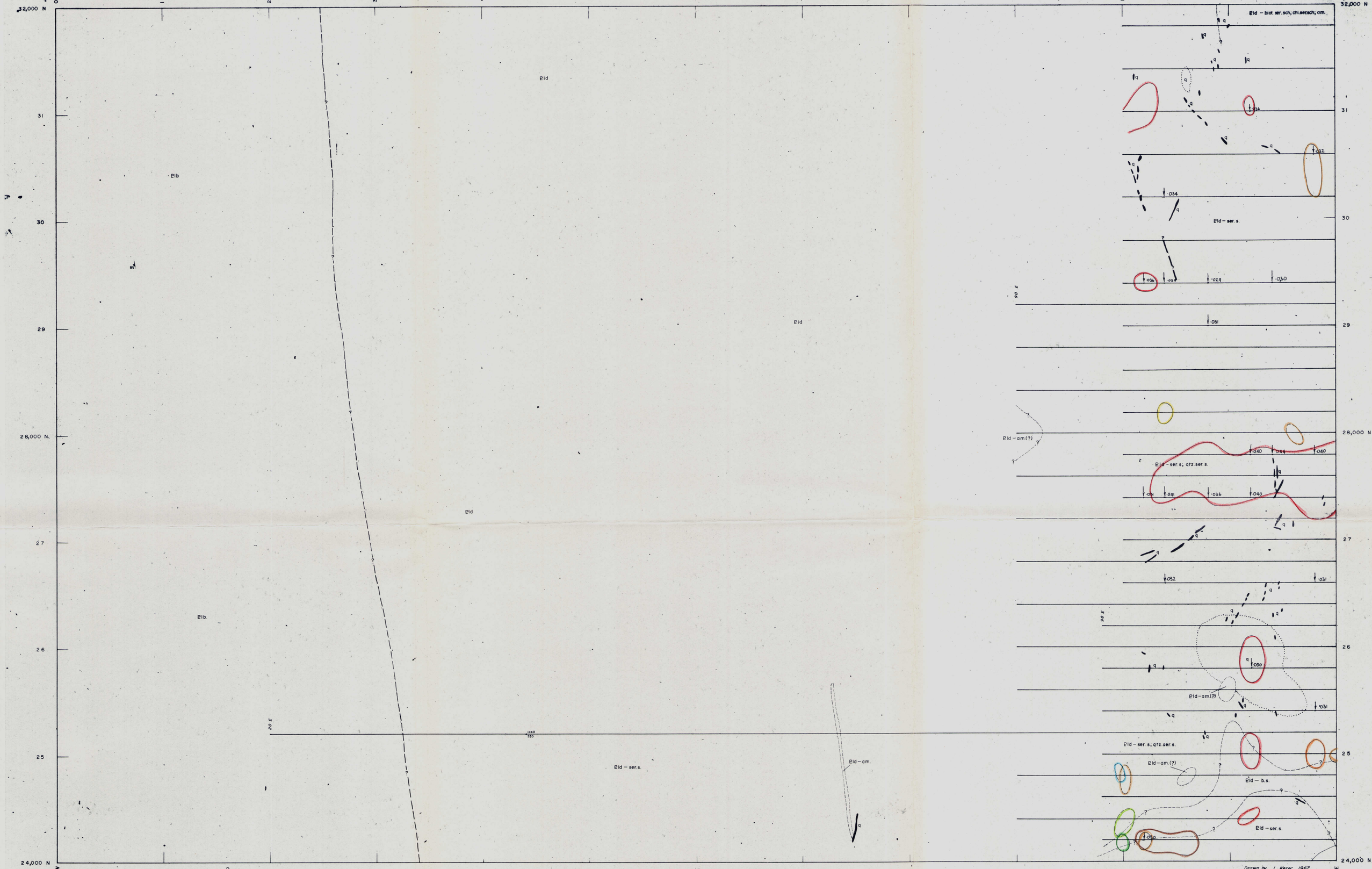
Drawn by [illegible] Nerec. 1967

D 52/A/159

PLATE 8.

RUM JUNGLE DISTRICT

SHEET E61 Geology



LOCATION DIAGRAM

B60	E51	E52
B70	E61	E62
B80	E71	E72

MAJOR GRID: T.E.P. mine grid, North 359°58'00" True

REFERENCE

LOWER PROTEROZOIC

Elb — BURRELL CREEK FORMATION
pale brown and purple (quartz, sericite, chlorite) slate and greywacke.

Eld — GOLDEN DYKE FORMATION
b.s. — black carbonaceous and/or graphitic slate; ser.s. — sericitic slate; qtz ser.s. — quartz sericite slate biot. ser. sch — biotite sericite schist; chl ser. sch. — chlorite sericite schist; am. — amphibolite.

SCALE
400 0 400 800 1200 FT
400 ft to 1 inch

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES AND ANOMALOUS SPOT VALUES

B.M.R. survey
- 400 p.p.m. Cu
- 400 p.p.m. Zn
- 200 p.p.m. Ni
- 200 p.p.m. Co
- 40 p.p.m. Mo
- ·036 units Radiometric contours
- Auger hole where radiometric value increases with depth. (Maximum value shown at hole locality)
- ·030

T.E.P. Ltd survey
- 200 p.p.m. Cu
- 200 p.p.m. Pb
- 400 p.p.m. Zn
- 200counts/sec Radiometric contour
- 1740 p.p.m. Pb / 520 p.p.m. Zn — Spot values

Vein quartz

Quartz rubble

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault

(Where location of boundaries and faults is approximate, line is broken, where inferred, queried.)

Strike and dip of bedding

PEGGED GRIDS

A. TRIANGLE AREA.

B. FINNISS ANABRANCH.

C. AIR PHOTO MAPPING.

Compilation based on:

(1) Dodson and Shotwell, Triangle Area 1964 survey, B.M.R. Record 1965/254

(2) Berkman (T.E.P.Ltd), Finniss Anabranch Area, 1966 survey.

(3) Marjoribanks (T.E.P.Ltd) mapping west of Triangle Area 1966 survey.

Bureau of Mineral Resources, Geology and Geophysics

Compiled by Y. Miezitis, March 1967

Record 1967/150

D52/A/160

RUM JUNGLE DISTRICT

PLATE 9.

SHEET E62 Geology

REFERENCE

? TERTIARY

fer. brecc. — ferruginous breccia, mostly pisolitic (laterite)

LOWER PROTEROZOIC ? PROTEROZOIC

dol — dolerite

GOLDEN DYKE FORMATION — Pld

b.s. — block carbonaceous and/or graphitic slate, schist, shale; chl. s. — chloritic schist, slate, ser. s. — sericitic schist, slate; gw — greywacke; am — amphibolite, biot cal. s. — biotite calcite slate, schist; qtz biot. s. — quartz biotite schist; chl. tc. s. — chloritic talc schist.

MASSON FORMATION

ACACIA GAP TONGUE — Plq

pyr qte — Pyritic quartzite; b.s. — black carbonaceous and/or graphitic slate, shale.

COOMALIE DOLOMITE — Plo

dolomite, tremolitic schist, quartzite

GEOCHEMICAL AND SURFACE RADIOMETRIC VALUES

BMR survey

400 ppm Cu
400 ppm Pb
400 ppm Zn
200 ppm Ni
200 ppm Co
.024 / .036 units — radiometric contours

Auger hole where radiometric value increases with depth (Maximum value shown at hole locality)

200 ppm Cu
200 ppm Pb
400 ppm Zn

Mapped outcrop and rock exposure
Vein quartz
Quartz rubble
Gossan

Formation boundary
Lithological boundary
Outcrop and rubble boundary
Fault
Shear zone
Axis of syncline
Dip and strike of bedding
Dip and strike of foliation
T.E.P. diamond drill hole, showing direction and depression where hole is inclined
B.M.R. diamond drill hole
T.E.P. churn drill hole
Bulldozed costean

Where location of boundaries, folds and faults is approximate, line is broken, where inferred, queried

A MT FITCH
B WEST FINNISS
C TRIANGLE GRIT
D DOLERITE RIDGE EXTENDED
E DOLERITE RIDGE EAST
F DOLERITE RIDGE
J BROWNS SW
H AREA 55

Compilation based on
(1) Mackay, Gates and Carter, Browns SW 1950-1951 mapping (BMR misc. lt. 47-21)
(2) T.E.P. Ltd geological data along Mt Burton - Browns SW line
(3) Ruxton and Shields, West Finniss and Dolerite Ridge East sections, BMR Record 1963/49.
(4) Yeaman and Pritchard, Browns SW to Dolerite Ridge East sections, BMR Record 1965/113.
(5) Dodson and Shatwell, Triangle Area 1964 survey, BMR report 1965/254.
(6) Sprott (T.E.P. Ltd), Mt Fitch No 1 1965 survey.
(7) Pritchard, diamond drilling 1964, BMR Record 1964/[illegible].
(8) Berkman (T.E.P. Ltd), Finniss-Anabranch, 1966 survey.

Compiled by C.O. Shatwell 1966

Plotted by Y. Mwizitis December 1966

Record 1967/150

D52/A/161

RUM JUNGLE DISTRICT

SHEET E63 Geology

Compiled by: Y. Miezitis June 1966

Amended by: Y. Miezitis February 1967

Record 1967/150

REFERENCE

? TERTIARY

fer. brecc. – ferruginous breccia, mostly pisolitic (laterite)

fer. ss – ferruginous sandstone (laterite)

? LOWER PROTEROZOIC

hem. qte. brecc – hematitic quartzite breccia

hem. rck. – hematitic rock, iron oxides, mainly hematitic

qte – quartzite / quartzite breccia

hem. qte – hematitic quartzite

lim. slt. ss. – limonitic siltstone and sandstone.

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Eld — b.s. – black carbonaceous and/or graphitic slate, schist; chl.s. – chloritic slate, schist; ser.s. – sericitic schist, slate; tc.s. – talcose schist; mds. – mudstone (green mudstone, hematitic mudstone, augen slate) am. – amphibolite

MASSON FORMATION

ACACIA GAP TONGUE

Ela — b.s. – black carbonaceous and/or graphitic slate; pyrqte – pyritic quartzite; ser.s. – sericitic slate.

COOMALIE DOLOMITE

Elo — dlm – dolomite; b.sh. – black shale; Undifferentiated dolomite, tremolitic dolomite, quartzite.

CRATER FORMATION

Elr — qtz. mic. sch. – quartz mica schist; mic sch. – mica schist; qtz. grt. – quartz grit.

ARCHAEAN

RUM JUNGLE COMPLEX

Ag — Undifferentiated granite, gneiss.

SCALE

4 0 0 ft to 1 inch

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES AND ANOMALOUS SPOT VALUES

B.M.R. survey

400 ppm / 1600 ppm	Cu
400 ppm / 1600 ppm	Pb
200 ppm	Ni
200 ppm / 800 ppm	Co
200 ppm	V
40 ppm	Mo
.024 / .036 units	Radiometric contours

T.E.P. Ltd survey

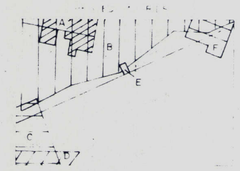
200 ppm	Ni
400 ppm	Pb
400 ppm	Zn
200 ppm	Co
400 counts/sec	Radiometric contour

Spot values

- + 400 ppm Pb
- + 200 ppm Ni
- + 200 ppm V
- + 400 ppm Zn
- + 200 counts/minute Radiometric

- Mapped outcrop and rock exposure
- Phosphate rock
- Base metal and uranium mineralisation
- q — Vein quartz
- q, qte — Vein quartz and quartzite

- Formation boundary
- Lithological boundary
- Outcrop and rubble boundary
- Fault
- Shear zone
- Axis of syncline (Where location of boundaries, folds and faults is approximate, line is broken; where inferred, queried.)
- Strike and dip of bedding
- Strike and dip of cleavage, schistosity
- Strike of vertical cleavage, schistosity
- Lineation on cleavage
- Minor anticline
- T.E.P. diamond drill hole showing direction and depression where hole is inclined
- A.M.S. diamond drill hole
- B.M.R. diamond drill hole
- Bore hole (drilled Commonwealth 1914)
- Mine shaft, accessible
- Mine shaft, inaccessible



A BUCKSHEE & RUM PLANT
B INTERMEDIATE
C BROWNS S.W.
D TRIANGLE AREA
E EMBAYMENT NORTH
F DYSONS NORTH

Note: Diamond and churn drill holes within the open cuts not shown

- Open cut boundary
- Overburden dump perimeter
- Bulldozed costean
- Formed road
- Vehicle track
- Trig station

D52/A/162

Compilation based on:

(1) Ward, 1949 – 1952 mapping, B.M.R. Record Nos 1950/14, 1950/132, 1953/139, 1953/141 and 1953/142

(2) Mackay, Gates and Carter, 1950 – 1951 mapping (B.M.R. map. N.T. 47 G-2)

(3) T.E.P. Ltd geological data along Dysons' open cut to Browns' prospect line (Geology by Thomas, Knight, Whitcher, Spratt, Berkman)

(4) Pritchard, Intermediate copper prospect, 1963 survey, B.M.R. Record No 1964/125.

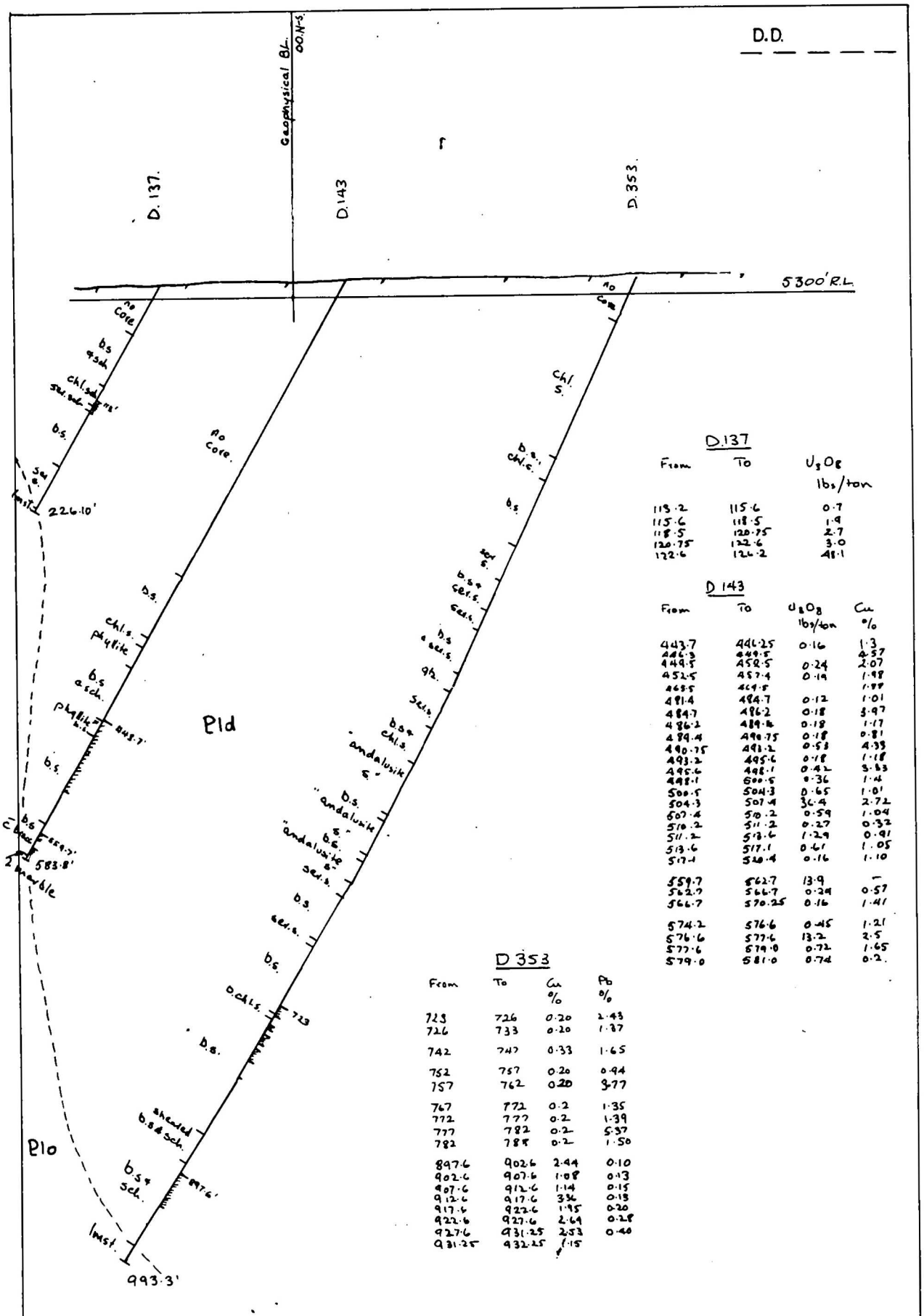
(5) Yeaman and Pritchard, Browns S.W. 1963 survey, B.M.R. Record No 1965/113.

(6) Spratt (T.E.P. Ltd), Browns S.W. 1964 survey.

(7) Spratt (T.E.P. Ltd.), Embayment North 1964 survey.

(8) Berkman (T.E.P. Ltd), Dysons North, 1966 survey.

PLATE 10 d.

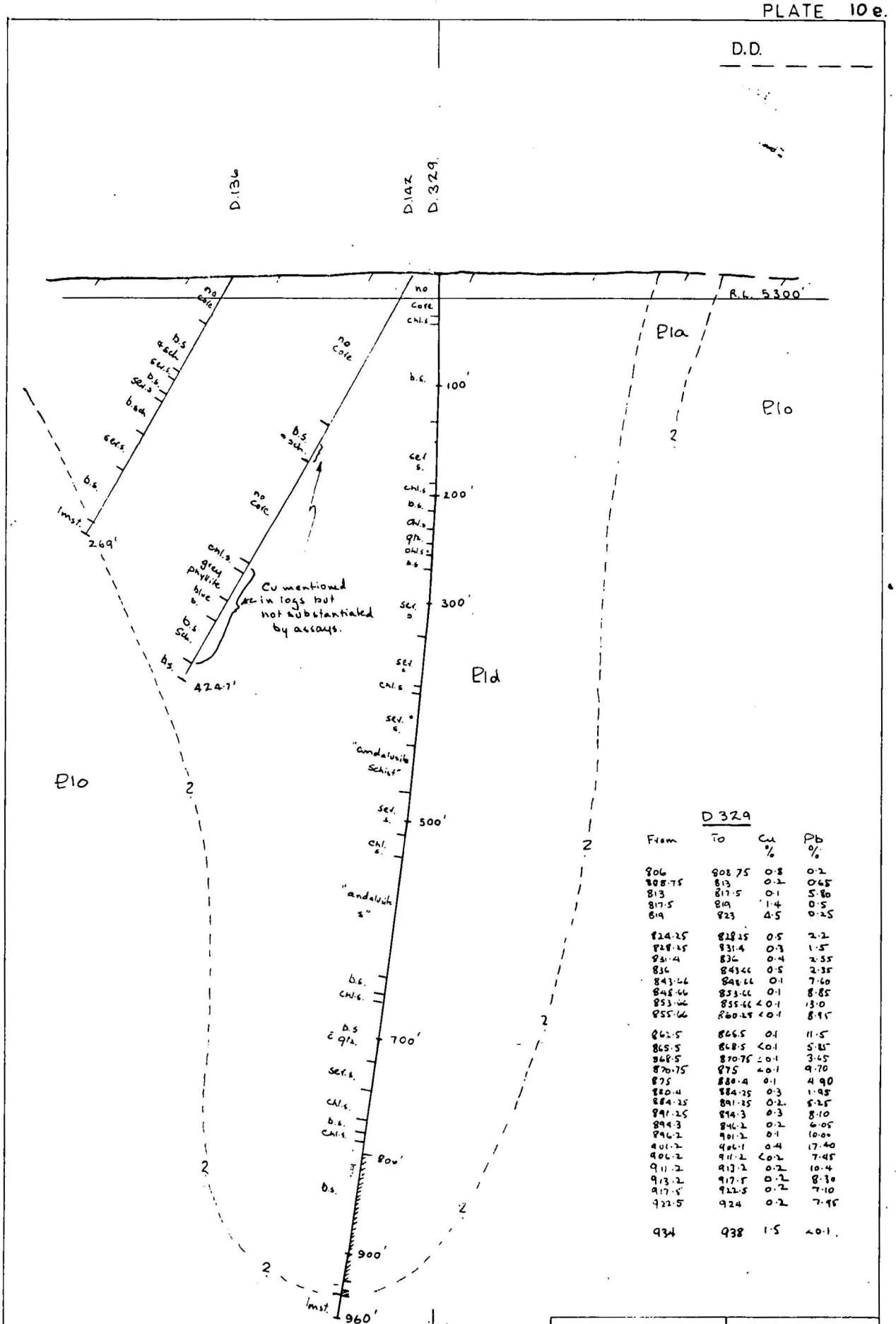


SHEET E63	0 SCALE 100FT
CO-ORDINATES N 28834 E 30265 MINE GRID	BEARING OF SECTION 335° LOOKING N.E. DEPRESSION

Record 1967/150

D 52/A/198

PLATE 10e.

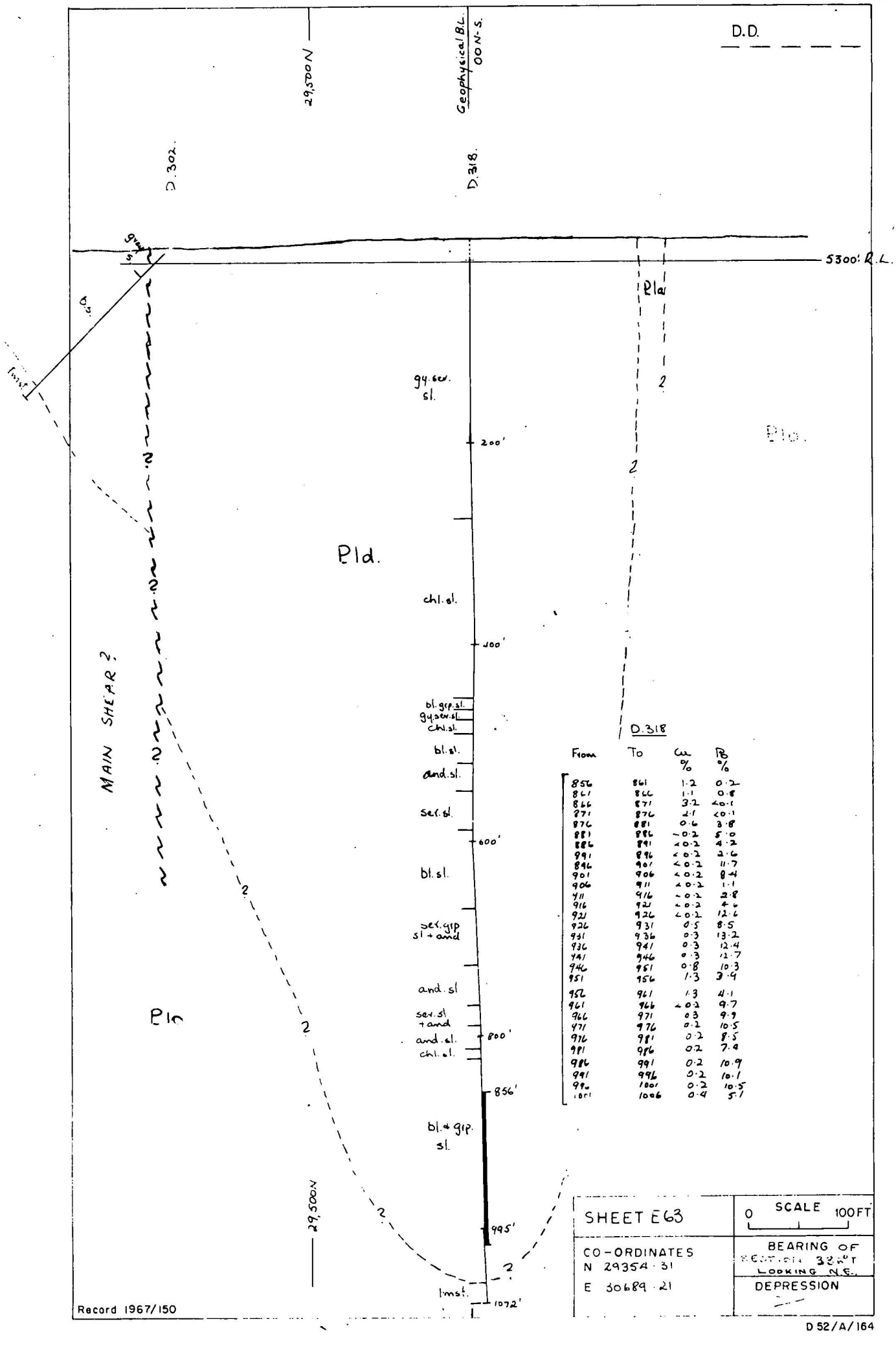


D 329

From	To	Cu %	Pb %
806	808.75	0.8	0.2
808.75	813	0.2	0.65
813	817.5	0.1	5.80
817.5	819	1.4	0.5
819	823	4.5	0.25
824.25	828.25	0.5	2.2
828.25	831.4	0.3	1.5
831.4	836	0.4	2.55
836	843.66	0.5	2.35
843.66	848.66	0.1	7.60
848.66	853.66	0.1	8.85
853.66	855.66	< 0.1	13.0
855.66	860.25	< 0.1	8.95
862.5	866.5	0.1	11.5
865.5	868.5	< 0.1	5.85
868.5	870.75	< 0.1	3.45
870.75	875	< 0.1	9.70
875	880.4	0.1	4.90
880.4	884.25	0.3	1.95
884.25	891.25	0.2	5.25
891.25	894.3	0.3	8.10
894.3	896.2	0.2	6.05
896.2	901.2	0.1	10.00
901.2	906.1	0.4	17.40
906.2	911.2	< 0.2	7.45
911.2	913.2	0.2	10.4
913.2	917.5	0.2	8.30
917.5	922.5	0.2	7.10
922.5	924	0.2	7.95
934	938	1.5	< 0.1

SHEET E63	0 SCALE 100 FT
CO-ORDINATES N 29,271 E 30,499 Mine Grid.	BEARING OF SECTION 336°T LOOKING N.E. DEPRESSION

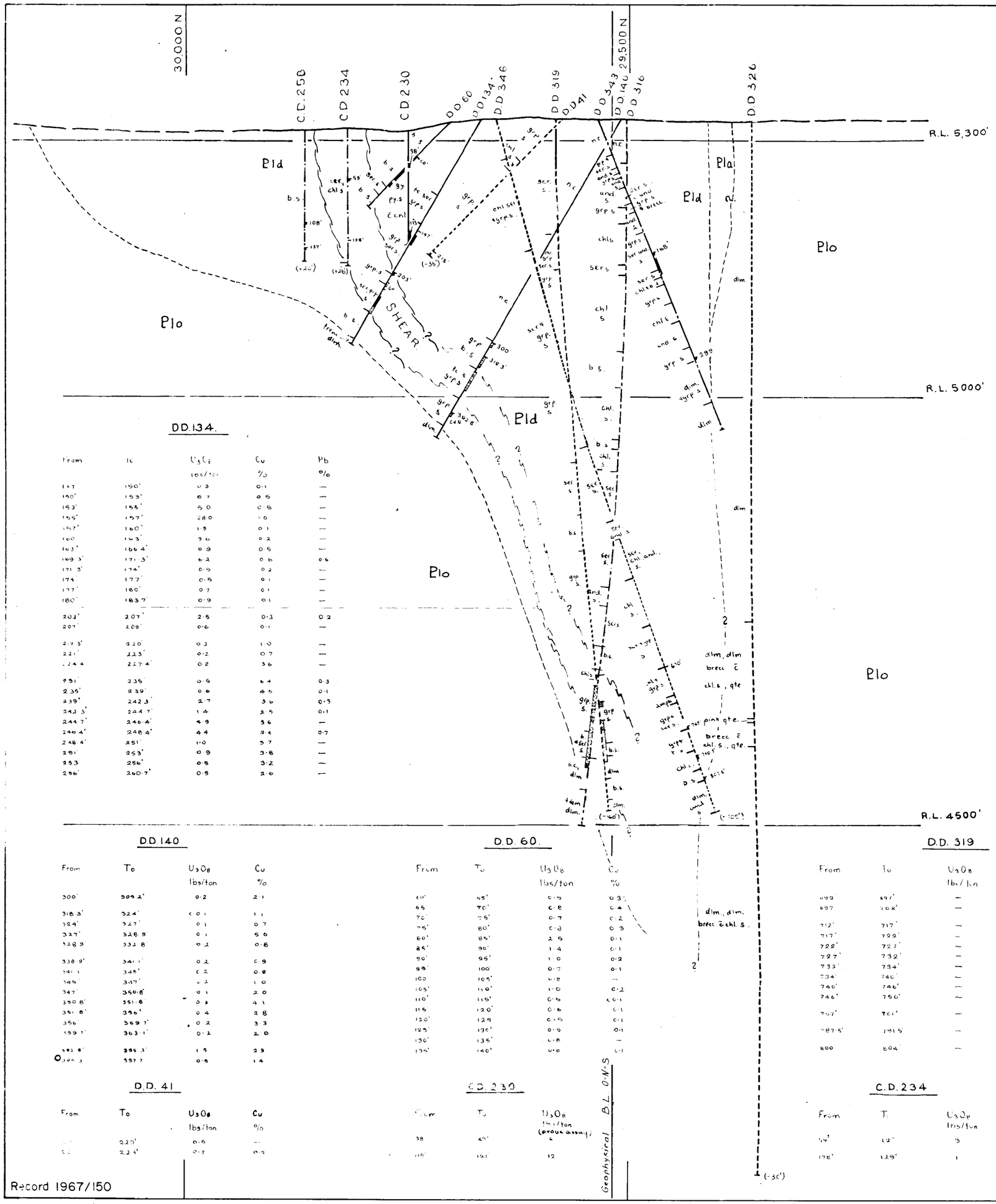
PLATE 10.f.



Record 1967/150

D 52/A/164

PLATE 10 g.



DD.134.

From	To	U_3O_8 lbs/ton	Cu %	Pb %
147	150'	0·3	0·1	—
150'	153'	0·7	0·5	—
153'	155'	5·0	0·5	—
155'	157'	28·0	1·0	—
157'	160'	1·9	0·1	—
160	163'	3·6	0·2	—
163'	166·4'	0·9	0·5	—
169·3'	171·3'	6·2	0·6	0·6
171·3'	174'	0·5	0·2	—
174	177'	0·5	0·1	—
177'	180'	0·7	0·1	—
180'	183·7'	0·9	0·1	—
203'	207'	2·5	0·3	0·2
207'	209'	0·6	0·1	—
217·3'	220'	0·2	1·0	—
221'	223'	0·2	0·7	—
224·4'	227·4'	0·2	3·6	—
231'	235'	0·5	6·4	0·3
235'	239'	0·6	4·6	0·1
239'	242·3'	2·7	3·6	0·3
242·3'	244·7'	1·4	2·5	0·1
244·7'	246·4'	4·9	3·6	—
246·4'	248·4'	4·4	3·4	0·7
248·4'	251'	1·0	3·7	—
251'	253'	0·9	3·8	—
253	256'	0·5	3·2	—
256'	260·7'	0·5	2·6	—

DD.140

From	To	U_3O_8 lbs/ton	Cu %
300'	305·2'	0·2	2·1
318·3'	324'	< 0·1	1·1
324'	327'	0·1	0·7
327'	328·9'	0·1	5·6
328·9'	332·8'	0·2	0·8
338·9'	341·1'	0·2	0·9
341·1'	345'	< 0·1	0·9
345'	347'	< 0·1	1·0
347'	350·8'	0·1	2·0
350·8'	351·8'	0·3	4·1
351·8'	356'	0·4	2·8
356'	359·7'	0·2	3·3
359·7'	363·1'	0·2	2·8
382·8'	385·3'	1·5	2·9
385·3'	387·7'	0·5	1·4

D.D. 41

From	To	U_3O_8 lbs/ton	Cu %
[illegible]	220'	0·5	[illegible]
[illegible]	224'	0·7	[illegible]

D.D. 60.

From	To	U_3O_8 lbs/ton	Cu %
60'	65'	0·5	0·3
65'	70'	0·8	0·4
70'	75'	0·7	0·2
75'	80'	0·2	0·3
80'	85'	2·5	0·1
85'	90'	1·4	0·1
90'	95'	1·0	0·2
95'	100	0·7	0·1
100	105'	0·8	—
105'	110'	1·0	0·2
110'	115'	0·5	< 0·1
115	120'	0·6	0·1
120'	125	0·5	0·1
125'	130'	0·5	0·1
130'	135'	0·8	—
135'	140'	0·6	0·1

C.D. 230

From	To	U_3O_8 lbs/ton (group assay)
38	45'	6
115	121'	12

D.D. 343

From	To	U_3O_8 lbs/ton
168'	171'	0·6
174'	177'	1·0
177'	180'	0·7
180'	183'	6·7
183'	186'	1·0
186'	189'	1·3
189'	192'	0·9
192'	195'	0·9
195'	200'	1·1
299'	300'	2·4
300'	301·3'	2·0

D.D.316

From	To	U_3O_8 lbs/ton	Cu %	Pb %	
668'	673'	—	1·2	< 0·1	37' x 1·4% Cu
673'	678'	—	1·2	< 0·1	
679'	680'	—	3·4	< 0·1	
680'	685'	—	1·0	< 0·1	
685'	690'	—	2·9	< 0·1	
690'	696'	—	1·9	< 0·1	
700'	705'	—	2·4	< 0·1	
705'	710'	—	0·7	0·2	
710'	712'	—	0·2	0·8	
712	717'	—	6·4	10·4	
717'	722'	—	3·1	0·3	
722	727'	—	5·1	< 0·1	
727'	730'	—	4·8	< 0·1	46' x 1·7% Cu
730'	733'	—	5·5	0·4	
733'	738'	—	2·6	1·9	
738'	739·6'	0·9	6·9	< 0·1	
739·6'	741·8'	0·5	3·8	0·2	
741·8'	745'	0·3	7·1	0·2	
745'	748·6'	0·2	4·6	0·5	
748·6'	751·3	0·2	3·5	1·0	
751·3'	753'	0·1	2·0	10·6	
754·3'	756·6'	tr.	0·5	1·5	

D.D.346

From	To	U_3O_8 lbs/ton
670'	674'	0·8
745'	748'	1·7
780·3'	782·9'	2·4
807·6'	809·9'	3·2

D.D. 319

From	To	U_3O_8 lbs/ton	Cu %	Pb %
682'	697'	—	0·3	1·2
697	702'	—	0·5	0·7
712'	717'	—	2·6	1·2
717'	722'	—	0·2	2·1
722'	727'	—	1·1	< 0·1
727'	732'	—	1·5	< 0·1
733'	734'	—	1·1	< 0·1
734'	740'	—	1·3	< 0·1
740'	746'	—	3·9	< 0·1
746'	750'	—	3·8	0·2
757'	761'	—	1·2	< 0·1
787·5'	791·5'	—	< 0·2	0·7
800	804'	—	0·5	0·7

C.D. 258.

From	To	U_3O_8 lbs/ton
108	110'	2
137'	139'	3

C.D.234

From	To	U_3O_8 lbs/ton
59'	62'	3
128'	129'	1

Geophysical BL. 0-W-S

SECTION 4

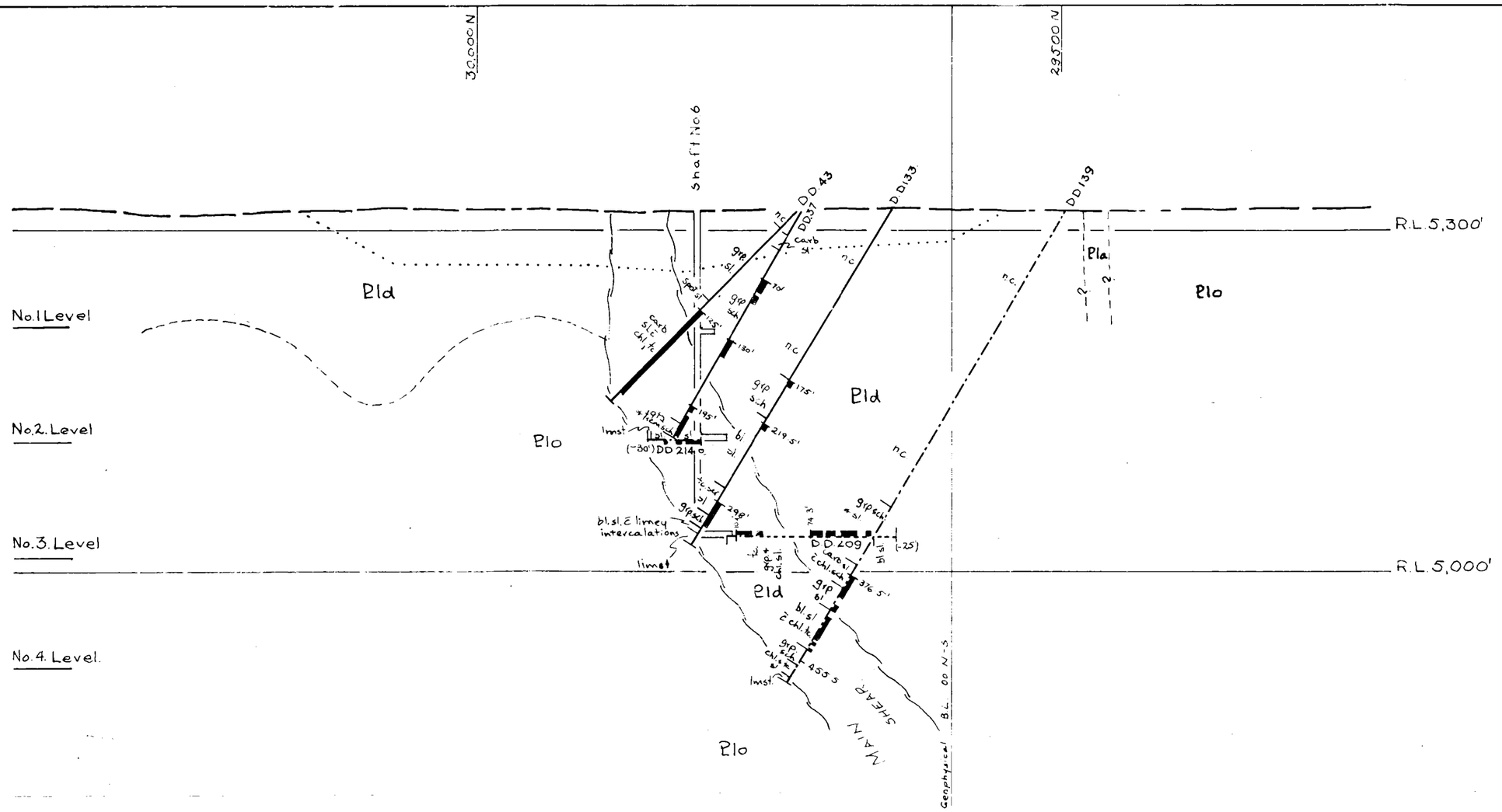
RUM JUNGLE DISTRICT
WHITES AREA

SECTION LOOKING 76° T
PLANE OF SECTION THROUGH
MINE N 29519 LOCAL N 00
GRID E 31053 GRID W 4690

SCALE 1" = 100'

Record 1967/150

D52/A8/355



D.D. 43

From	To	U_3O_8 lbs/ton	Cu %
125	130	2·8	0·9
130	135	2·0	1·1
135	140	1·7	0·8
140	145	1·6	0·9
145	150	1·0	0·5
150	155	·0	0·9
155	160	1·0	0·7
160	165	1·1	0·6
165	170	1·0	1·0
170	175	0·9	0·7
175	180	0·8	0·4
180	185	0·8	0·6
185	190	1·0	0·6
190	195	1·0	0·5
195	200	1·0	0·1
200	210	1·0	1·0
210	215	0·9	0·4
215	220	1·0	0·1
220	225	1·1	0·7

DD.37

From	To	U_3O_8 lbs/ton	Cu %
70	75	0·5	0·2
75	80	1·7	0·2
85	90	2·6	0·6
130	135	0·5	0·1
135	140	2·6	0·1
140	145	0·5	Nil
195	200	0·2	0·7
205	210	0·2	2·1
210	215	0·3	0·8
220	225	0·2	1·2
225	230	0·2	1·8

DD 133

From	To	U_3O_8 lbs/ton	Cu %	Pb %
175	180	0·3	1·0	-
219·5	288	0·7	< 0·1	-
288	300	1·0	0·1	-
300	302·5	4·9	0·2	-
302·5	305	0·6	0·2	-
305	307·6	1·4	0·2	-
307·5	310	68·0	0·3	-
310	311·3	11·6	0·3	1·6
311·3	312·4	275·3	0·3	3·7
312·4	314	3·4	0·1	-
314	316	0·8	< 0	-
316	322	7·8	0·9	-
322	325	1·0	0·4	-

DD 214

From	To	U_3O_8 lbs/ton	Cu %	Pb
0	3	1·8	0·3	
3	6	2·5	0·3	
6	10·3	3·3	0·2	
10·3	12·7	1·9	0·2	
12·3	21	3·1	0·2	
30	32·4	0·7	0·2	

DD 139

From	To	U_3O_8 lbs/ton	Cu %
376·5	380·5	0·2	1·6
380·5	382·4	0·1	1·1
382·4	384	0·2	1·2
384	390·3	< 0·1	0·7
398·7	402·1	0·3	1·9
410·3	413	0·3	2·8
413	418·2	0·5	3·4
418·2	422·6	0·3	1·0
422·6	427	3·4	1·7
427	430·1	< 0·1	1·1
430·1	432·7	0·1	1·3
435·2	438·6	0·2	0·7
441·3	443·4	0·6	0·9
455·5	457·5	0·3	1·3

DD 209

From	To	U_3O_8 lbs/ton	Cu %
10·4	12·4	2·3	0·2
12·4	16·6	12·1	0·4
16·6	18·4	0·5	0·2
18·4	21·3	3·4	0·5
21·3	23·5	5·1	0·6
26	28·3	1·0	0·4
28·3	32	0·8	0·7
74·3	77·4	0·1	0·7
77·4	80·3	0·2	0·8
80·3	82	< 0·1	0·8
82	85	0·1	1·2
88	92	0·1	0·7
92	95	0·2	0·9
101	104	0·2	0·8
104	106	0·1	0·8
106	108	0·1	0·8
108	111	< 0·1	1·0
111	113	0·1	1·0
113	115	< 0·1	1·5
124	27	0·1	0·8

Modified from T.E.P. Section No 10.

D52/A/166

RUM JUNGLE DISTRICT
WHITES AREA

SECTION LOOKING 80°T

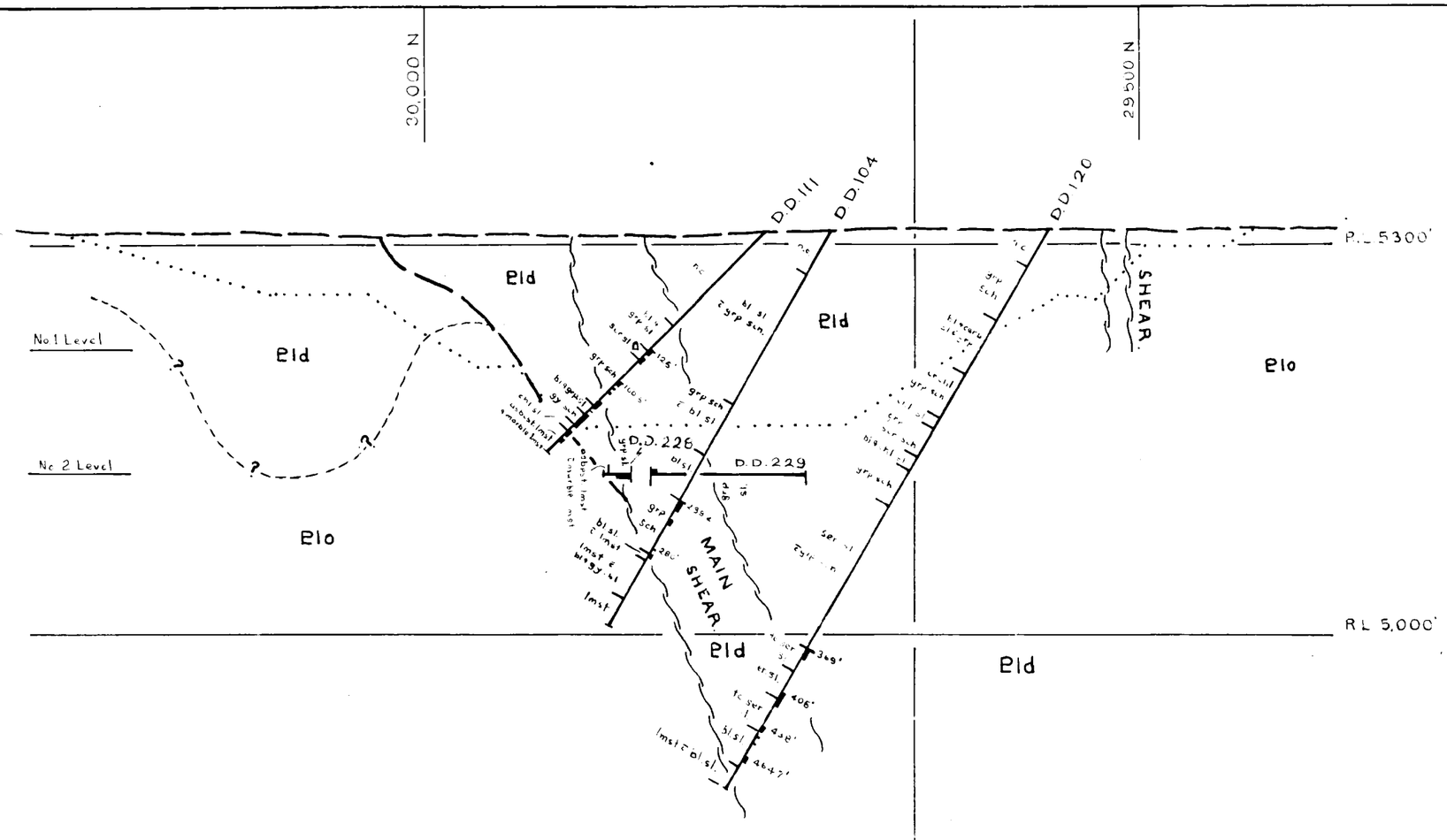
PLANE OF SECTION THROUGH

MINE N 29590 LOCAL N 00

GRID E 31214 GRID W 4512

SCALE 1" = 100'

Record 1967/150



D.D.111

From	To	U_3O_8 lbs/ton	Cu %	Pb
120'	126.5'	3.7	0.3	—
126.8'	128.9'	8.4	5.2	—
128.9'	129.9'	0.6	<0.1	—
130.9'	131.5'	<0.5	<0.1	—
133'	134.5'	0.5	0.1	0.1
134.5'	135.9'	2.4	—	—
135.9'	139'	0.5	0.1	0.1
139'	140'	1.6	<0.1	0.1
160.5'	162.5'	—	1.1	<0.1
165.5'	166.4'	21.7	1.1	—
169.5'	171'	0.5	0.1	—
177'	181'	—	0.5	2.0
181'	183.2'	—	0.9	6.7
183.5'	184.1'	—	0.2	4.0
184.1'	184.7'	0.1	0.5	3.5
184.7'	185'	0.1	0.7	4.0
185.3'	186'	0.1	0.9	2.7
186'	186.5'	0.2	0.8	3.6
191.5'	192'	<0.2	1.6	3.5
194.8'	196'	0.2	2.4	—
196'	197.8'	0.2	2.2	—
197.5'	200'	0.3	2.1	0.7
200.4'	204.2'	0.2	3.2	—
204.2'	206.8'	0.4	3.1	—
206.8'	208'	—	3.4	—
210'	211'	0.3	4.2	—
213'	213.5'	0.3	5.7	—
213.5'	215.5'	0.1	0.9	—
216'	218'	0.6	0.3	0.1
219'	224.5'	—	1.6	0.4

D.D.120

From	To	U_3O_8 lbs/ton	Cu %
369'	371'	0.2	1.6
371'	374'	0.2	1.9
374'	377'	0.2	1.5
377'	381'	0.1	0.8
395'	410'	0.1	1.4
410'	415'	0.1	0.7
415'	420'	1.5	0.8
438'	440'	2.4	0.3
440'	441.5'	4.6	0.4
441.5'	443'	0.6	0.4
444.5'	447.2'	12.9	2.0
451.8'	453'	0.5	1.0
464.7'	466.4'	0.1	<0.1

D.D.104

From	To	U_3O_8 lbs/ton	Cu %
239.2'	244'	0.6	—
244'	247'	0.6	—
256.5'	259.5'	—	1.7
280'	281.8'	0.2	0.7
284.5'	286'	0.5	3.0
286'	290.2'	0.4	1.4

D.D.228

From	To	U_3O_8 lbs/ton	Cu %
0	11'	0.3	0.9

D.D.229

From	To	U_3O_8 lbs/ton	Cu %
0	5.4'	0.3	1.7

Diagonal 00 N.S Baseline

Modified from T.E.P. Section No. 9.

D52/A/167

RUM JUNGLE DISTRICT
WHITES AREA

SECTION LOOKING 66°T
PLANE OF SECTION THROUGH
MINE N 29658 LOCAL N 00
GRID E 31365 GRID W 4348

SCALE 1" = 100'

Record 1967/150

PLATE 10.

30,500 N | 30,000 N | 29,500 N

DD 17 | DD 44 (-16) | DD 920 (-410)

R.L. 5,300'

R.L. 5,000'

R.L. 4,700'

No 1 Level

No 2 Level

No. 3 Level

No 4 Level

Pld

Plo

MAIN SHEAR

SHEAR

WHITE'S OPEN CUT.

DD 264

DD 267

D.D 220

DD 256

DD 260

DD 323 (-110')

DD 322 (-110')

Zone of uranium and copper mineralization

Anomalous radioactivity

Baseline

00-N-S

Uranium-Copper Ore

Copper Ore

Lead Ore

Uranium Copper Lead mineralization

D.D. 920

From	To	U_3O_8 lbs/ton	Cu %	Pb %	Zn %
787'2"	791'4"	0·32			
791·4	796	0·59			
796	799	4·40			
800	803	0·94			
803	806	—			
877	880	0·12	0·19	0·01	0·01
880	883	1·79	0·55	0·04	0·03
883	886	0·59	1·6	0·02	0·02
886	889	0·18	2·2	0·68	0·03
889	892		1·1	4·7	0·06
892	895		0·41	4·6	0·06
895	901		0·64	2·6	0·18
901	904		1·3	1·3	0·40
904	907		0·19	1·2	0·54
907	910		0·22	0·68	2·4
910	913		0·61	1·7	3·7
913	916		0·01	4·0	1·0
916	919		0·10	9·2	1·2
919	922		0·25	3·5	0·15
922	925		2·0	1·1	0·03
925	928		2·6	1·1	0·07
928	931		1·2	14·4	0·14
931	934		1·5	8·0	0·03
934	937		2·7	0·57	0·02
937	940		2·6		
940	943		3·5		
943	946		5·0		
946	949		8·3		
949	952		10·2		
952	955		11·7		
955	958		11·7		
958	961		10·2		
961	964		10·2		
964	967		7·3		
967	970		6·0		
970	973		6·3		
973	976		5·4		
976	979	0·26	4·6		
979	982	0·48	4·9		
982	985	1·31	6·7		
985	988	0·81	6·5		

D.D 920 (cont')

From	To	U_3O_8 lbs/ton	Cu %
988 -	991	1·35	6·8
991	994	0·46	2·6
994	997	0·19	6·73

D.D 322.

From	To	U_3O_8 lbs/ton	Cu %
304	309	—	1·0
309	314	—	1·2
314	315	—	3·8
315	316	—	3·1
316	317	—	1·9
317	318	0·4	1·1
318	319	0·2	1·1
326	321	0·6	5·4
321	322	0·9	0·5
322	323	0·5	0·3
334	339	—	1·8
339	344	—	0·6
344	349	—	4·9
349	351·3	—	0·9
351·3	358·5	—	2·0

D.D 220

From	To	U_3O_8 lbs/ton	Cu %
11'	16	2·6	3·8
51'	54'	1·4	1·2
54	56·4	0·4	0·7
56·4	59'	1·1	1·2
59'	61·4'	1·5	0·5
61·4	64	1·9	2·1
64'	66·4	1·3	2·4
66·4	68·4	0·7	2·3
68·4'	71·4'	0·4	3·6
71·4'	74·4	0·3	0·7
74·4'	78·7	0·3	3·7
78·7'	80·1'	0·4	0·8
80·1'	83·6'	0·5	< 0·1
83·6'	88·6'	0·4	1·7
88·6'	92·2'	0·5	2·1
96·3'	103'	0·6	1·5
103'	113'	1·0	0·6
113'	120'	0·5	2·0
120'	123'	0·8	1·2
123'	129·4'	0·3	0·7
129·4'	133·4	3·1	2·1
133·4	138'	0·1	1·3

D.D 256

From	To	U_3O_8 lbs/ton	Cu %
194'	196'	3·1	1·1
196'	200'	1·4	0·4
200'	204'	3·1	1·5
204'	208'	2·0	0·7
208'	212'	0·3	4·4

D.D 260

From	To	U_3O_8 lbs/ton	Cu %
118'	122'	0·5	3·1
122'	126'	6·9	1·1
131·6	133·5'	0·2	0·8
137'	142'	0·6	0·9
151'	155'	20·1	0·1

D.D 323.

From	To	U_3O_8 lbs/ton	Cu %
130	135	—	1·0
275	280	—	0·8
285	290	—	0·8
300	304·8	—	0·5
310	315	—	1·1
320	325	—	0·7
340	345	—	1·8
345	350	—	2·3
350	355	—	0·8
360	365	—	1·1
425	427·6	—	1·1
427·6	433·6	—	6·5
433·6	434·8	3·38	10·2
434·8	440	0·24	3·1
440	445	0·16	3·8

SECTION 5

RUM JUNGLE DISTRICT
WHITES AREA

SECTION LOOKING 66° T

PLANE OF SECTION THROUGH

MINE N 29780 LOCAL N 00

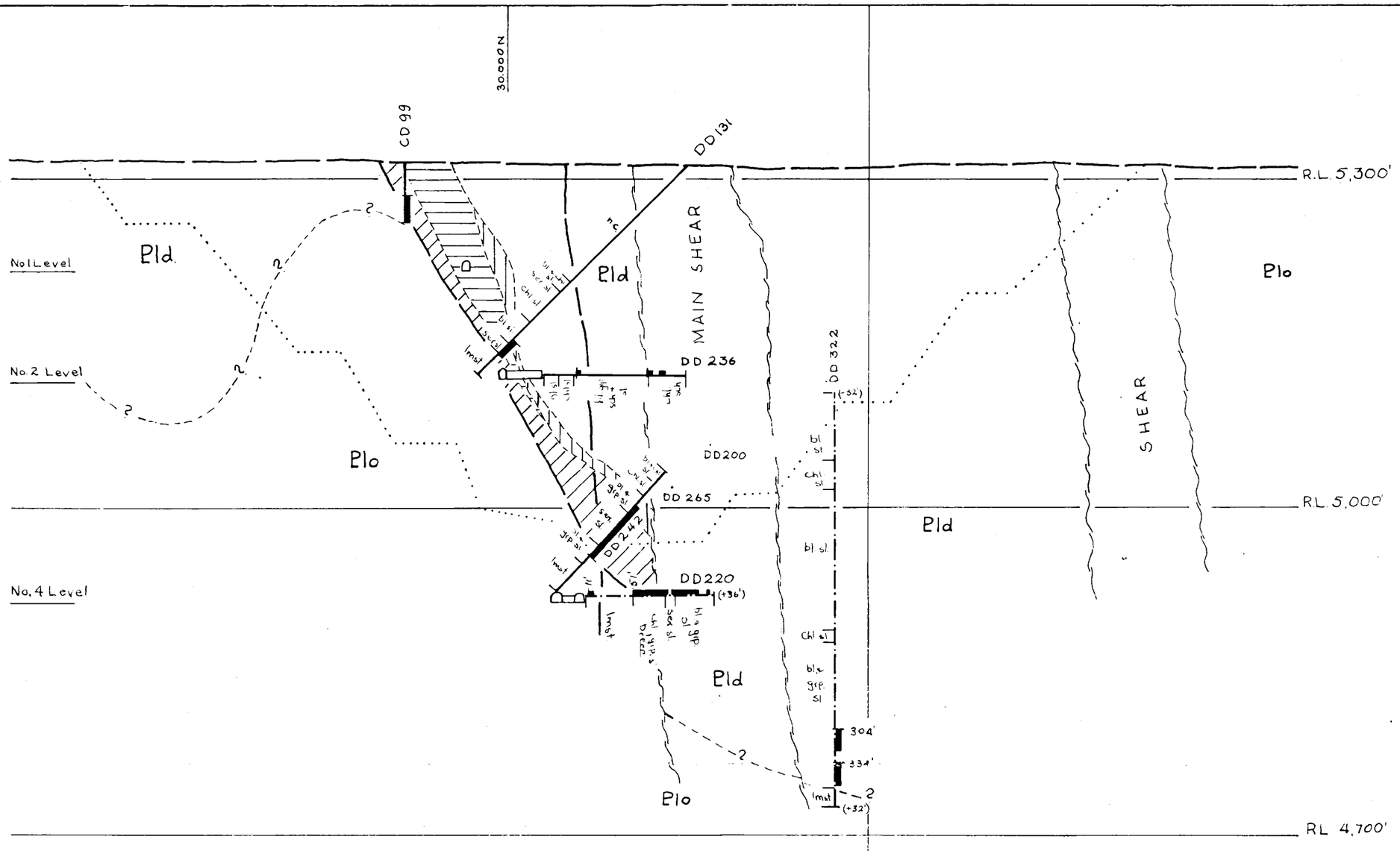
GRID E 31746 GRID W 4042

SCALE 1" = 100'

Modified from T.E.P. Section No 6.

D52/A8/356

Record 1967/150



DD 220

From	To	U_3O_8 lbs/ton	Cu %
11	16	2·5	3·8
51	54	1·4	1·2
54	56·4	0·4	0·1
56·4	59	1·0	1·2
59	61·4	1·5	0·5
61·4	64	1·9	2·1
64	66·4	1·3	3·4
66·4	68·4	0·7	2·3
68·4	71·4	0·4	3·6
71·4	74·4	0·3	0·7
74·4	78·7	0·3	3·7
78·7	80·1	0·4	0·8
80·1	83·6	0·5	<0·1
83·6	88·6	0·4	1·7
88·6	92·2	0·5	2·1
92·3	103	0·4	1·5
103	113	1·0	0·6
113	120	0·5	2·0
120	123	0·5	1·2
123	129·4	0·3	0·7
129·4	133·4	0·1	2·1
133·4	138	0·1	1·3

DD 322.

From	To	U_3O_8 lbs/ton	Cu %
304	309	-	1·0
309	314	-	1·2
314	315	-	3·8
316'	316	-	3·1
316	317	-	1·0
317	318	0·4	1·1
318	319	0·2	1·1
320	321	0·6	0·4
321	322	0·9	0·3
322	323	0·5	0·3
334	339	-	1·8
339	344	-	0·6
344	349	-	0·9
349	352·3	-	0·9
352·3	355·5	-	2·0

30,000N

Geophysical BL. 00 N-S

Modified from
T.E.P. Section No. 5.

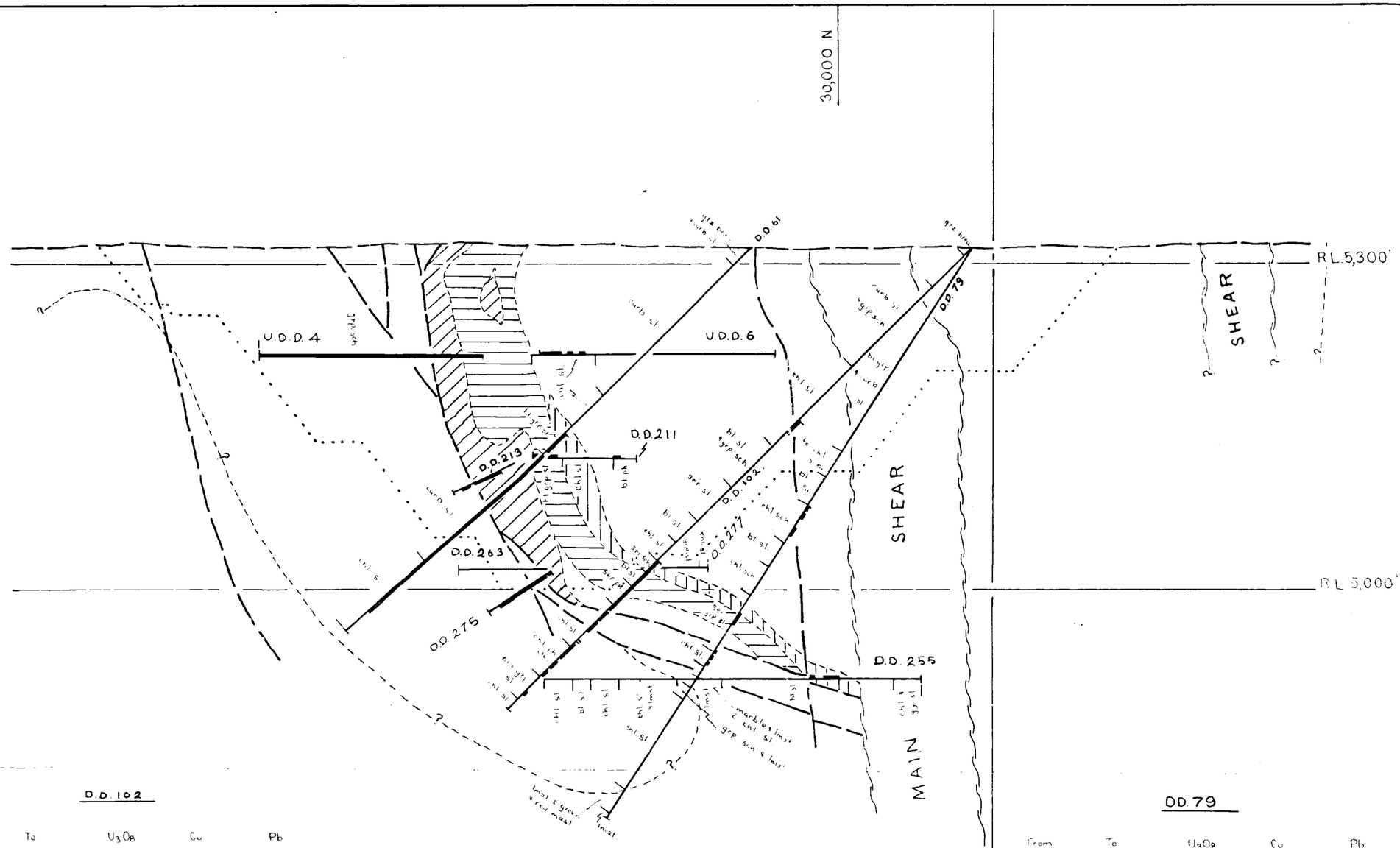
D52/A/169

Record 1967/150

RUM JUNGLE DISTRICT
WHITES AREA

SECTION LOOKING 28½°T
PLANE OF SECTION THROUGH
MINE N 29842 LOCAL N 00
GRID E 31784 GRID W 3890

SCALE 1" = 100'



D.D. 102

From	To	U_3O_8 lbs/ton	Cu %	Pb %
442.5'	443.5'	0.1	1.1	0.4
	445'	0.2	2.4	0.1
	448'	—	1.7	—
	452'	—	1.9	—
	465'	0.3	3.5	0.1
	460'	—	2.9	—
	462'	0.1	6.0	0.3
	463'	0.2	2.0	1.1
	465'	0.3	6.3	—
	468.8'	—	2.2	—
	472.7'	0.2	1.2	0.1
	474.3'	—	0.1	—
	476.5'	0.5	2.7	1.1
	478.5'	1.1	6.3	—
	484'	1.1	3.4	0.3
	486.5'	0.3	5.3	—
	488.5'	0.3	0.1	—
	489.5'	0.3	4.3	—
	491'	0.6	4.5	—
	493.5'	5.3	6.0	0.1
	498'	0.8	1.0	—
	500'	0.7	2.2	—
512'	513'	0.3	0.9	—
514'	516'	1.7	0.6	—
516'	517.5'	2.0	0.4	0.1
	520'	2.4	0.3	0.1
	522'	2.4	0.6	—
	524.8'	2.1	0.5	—
	527'	0.6	0.9	0.1
	529.5'	3.8	0.6	—
	531.5'	3.1	0.8	—
	533.5'	0.8	0.2	—
	534.5'	0.6	0.2	0.1
	536.5'	0.7	0.2	0.2
	541.5'	6.4	0.2	0.1
	544'	1.2	<0.1	0.1
	546.5'	4.4	<0.1	—
	549'	1.3	<0.1	—
	554'	3.0	<0.1	—
	556.5'	1.2	<0.1	—
	558'	0.5	—	—

DD. 61

From	To	U_3O_8 lbs/ton	Cu %
400'	405'	1.2	0.3
405'	410'	1.3	1.3
410'	415'	1.1	1.2
415'	420'	1.3	1.3
420'	425'	1.3	—
425'	430'	1.7	1.8
430'	435'	1.6	1.9
435'	440'	1.6	2.2
440'	445'	1.8	1.7
445'	450'	2.0	2.6
450'	455'	1.7	—
455'	460'	1.7	—
460'	465'	1.8	—
465'	470'	1.3	—
470'	475'	1.3	—
475'	480'	1.3	3.6
480'	485'	1.3	2.6
485'	490'	1.6	1.7
495'	500'	1.2	1.4
500'	505'	0.9	1.1
505'	510'	0.8	0.6
510'	515'	0.9	0.6
515'	520'	0.9	2.0

DD. 255

From	To	U_3O_8 lbs/ton	Cu %	Pb %
240'	243'	0.1	1.0	<0.2
250.5'	254'	0.1	<0.1	11.8
254'	258'	<0.1	<0.1	10.7
258'	261'	0.1	<0.1	9.7
261'	263.5'	0.3	1.0	15.7
263.5'	266'	0.1	0.7	2.8

DD. 79

From	To	U_3O_8 lbs/ton	Cu %	Pb %
398.5'	403.5'	—	0.1	4.8
403.5'	408.5'	—	0.1	9.6
408.5'	410.5'	0.2	0.2	10.0
410.5'	413.5'	0.1	0.2	5.0
440	443'	—	0.7	0.1
446'	448.5'	0.2	1.0	Tr
448.5	451.2'	0.2	2.4	—
452'	454.5'	0.1	1.4	—
454.5	456.5	0.2	1.0	0.1
456.5	458.5	0.3	0.6	0.2

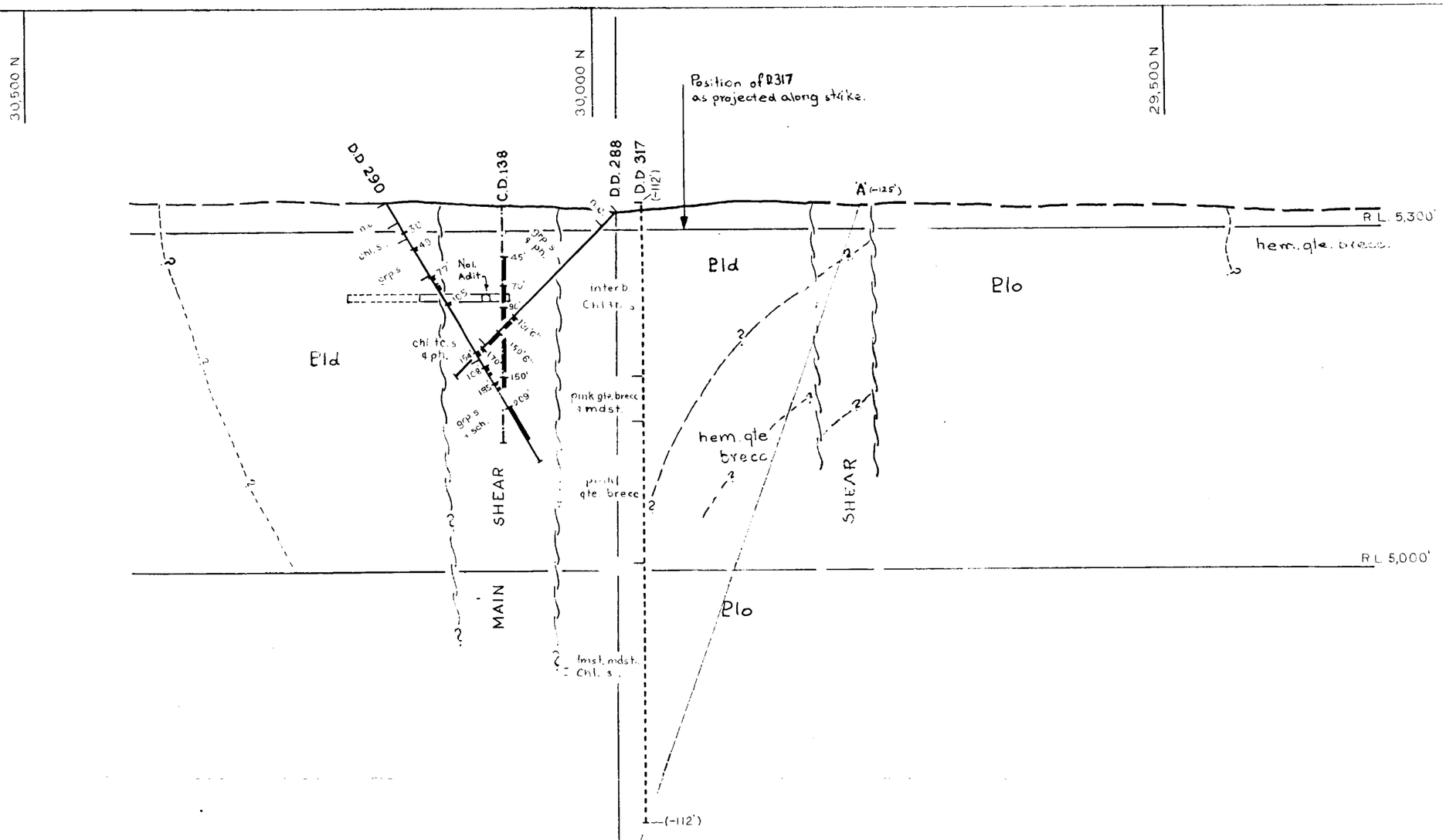
From	To	U_3O_8 lbs/ton	Cu %
0'	4'	4.7	3.1
6'	9'	0.9	0.8
9	12'	0.7	0.3
12'	15'	3.6	0.6
15'	18'	2.6	0.2
18'	21'	8.4	0.7
21'	24'	5.2	1.0
24'	26'	4.1	1.3
26'	29'	13.6	0.4
29	32'	6.4	0.2
32'	35'	2.6	0.3
35'	37'	0.9	0.1
37'	39'	0.8	<0.1
39'	42'	2.2	<0.1
42'	45'	1.9	—
45'	48'	2.7	—
48'	51'	0.9	—
51'	54'	0.8	—
54	57'	0.7	—

Modified from T.E.P Section No 2.

D52/A/170

RUM JUNGLE DISTRICT WHITES AREA
SECTION LOOKING T PLANE OF SECTION THROUGH MINE 29924 N LOCAL 00 N-S GRID 31965 E GRID 3.692 W
SCALE 1" = 100'

Record 1967/150



DD.290

From	To	U_3O_8 lbs/ton	Cu. %
30'	32'	1·0	0·4
49'	51'	0·9	7·1
77'	80'	0·6	< 0·1
84'	85	0·6	0·2
86'	97·10'	0·3	3·0
87·10'	91'	0·4	0·9
105'	107'	0·3	1·1
154'	157'	0·8	< 0·1
168'	171'	0·5	< 0·1
173'	175'	0·2	4·2
185'	187'	1·4	0·1
189'	191'	0·7	0·4
209'	211'	0·2	0·8
211'	214'	0·4	0·8
214'	216'	0·7	< 0·1
216'	216·8'	85·5	0·5
216·8'	216·5'	0·7	0·2
218·5'	220·5'	20·2	0·4
220·5'	222'	1·3	0·1
222'	223·8'	2·9	0·1
223·8'	226'	9·4	< 0·1
226'	229'	1·0	3·4
229'	230·3'	8·8	0·3
230·3'	232'	0·9	< 0·1
232'	233·2	0·9	< 0·1
233·2'	236·5'	1·2	< 0·1
236·5'	237·7'	0·5	0·6
237·7'	243'	0·5	< 0·1

C.D. 138

From	To	U_3O_8 lbs/ton
45'	50'	1·2
50'	55'	0·8
55'	65'	1·7
60'	69'	0·5
70'	75'	1·4
75'	80'	1·0
80'	85'	0·5
90'	95'	0·8
98'	100'	2·4
100'	105'	1·5
108'	110'	1·8
110'	115'	0·8
115'	120'	1·2
120'	125'	1·5
125'	130'	0·7
130'	135'	1·1
135'	140'	0·7
140'	145'	0·3
150'	155'	0·8
155'	160'	1·2

D.D. 288

From	To	U_3O_8 lbs/ton	Cu %
131·6'	133·6'	5·0	0·2
133·6	136'	0·7	0·2
137'	139'	0·7	< 0·1
139'	141'	0·6	< 0·1
141'	143'	0·5	< 0·1
152·2'	154'	0·6	0·2
154'	156·3'	0·8	< 0·1
156·3'	158'	1·5	< 0·1
158'	161'	0·7	< 0·1
161'	163·9'	0·8	0·1
170·6'	173·8'	0·9	< 0·1

Baseline

Geophysical

RUM JUNGLE DISTRICT
WHITES AREA

SECTION LOOKING 83° T.

PLANE OF SECTION THROUGH

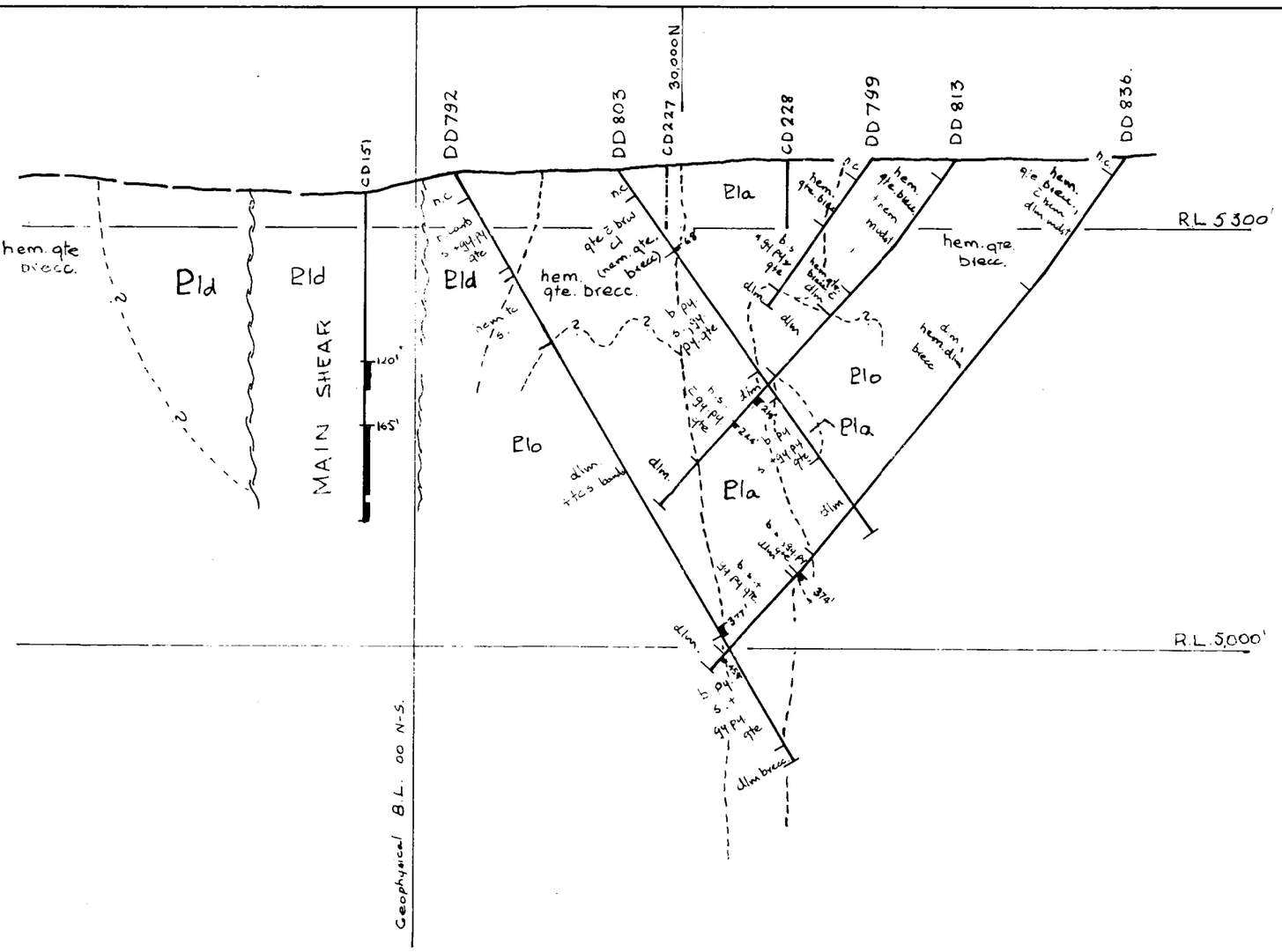
N 29981 } MINE GRID — N 00 W 3552 } LOCAL GRID

SCALE 1" = 100'

Record 1967/150

D 52/A/171

BUREAU OF MINERAL RESOURCES, (Amended June 1968).



CD 151

From	To	U_3O_8 lbs/ton
120	125	1·9
125	130	1·9
130	135	0·7
135	140	0·5
165	170	1·4
170	175	1·8
175	180	1·6
180	185	1·3
185	190	1·8
190	195	0·8
195	200	2·9
200	205	1·2
205	210	1·3
210	215	1·4
220	225	1·9
225	230	0·7
230	235	4·3

DD 792.

From	To	U_3O_8 lbs/ton
377	378	0·5
378	384	21·4
384	396	0·5
444	449	0·5

D.D. 803

From	To	U_3O_8 lbs/ton
69	71	0·9

D.D. 813

From	To	U_3O_8 lbs/ton
219	222	0·6
222	225	1·0
244	247	0·5

DD 836

From	To	U_3O_8 lbs/ton
374	376	0·5
376	378	2·6
459	461	0·5
461	463	2·8
465	467	0·6

RUM JUNGLE DISTRICT
WHITES AREA

SECTION LOOKING 68°T
PLANE OF SECTION THROUGH
MINE N 30176 LOCAL N 00
GRID E 32536 GRID W 3070

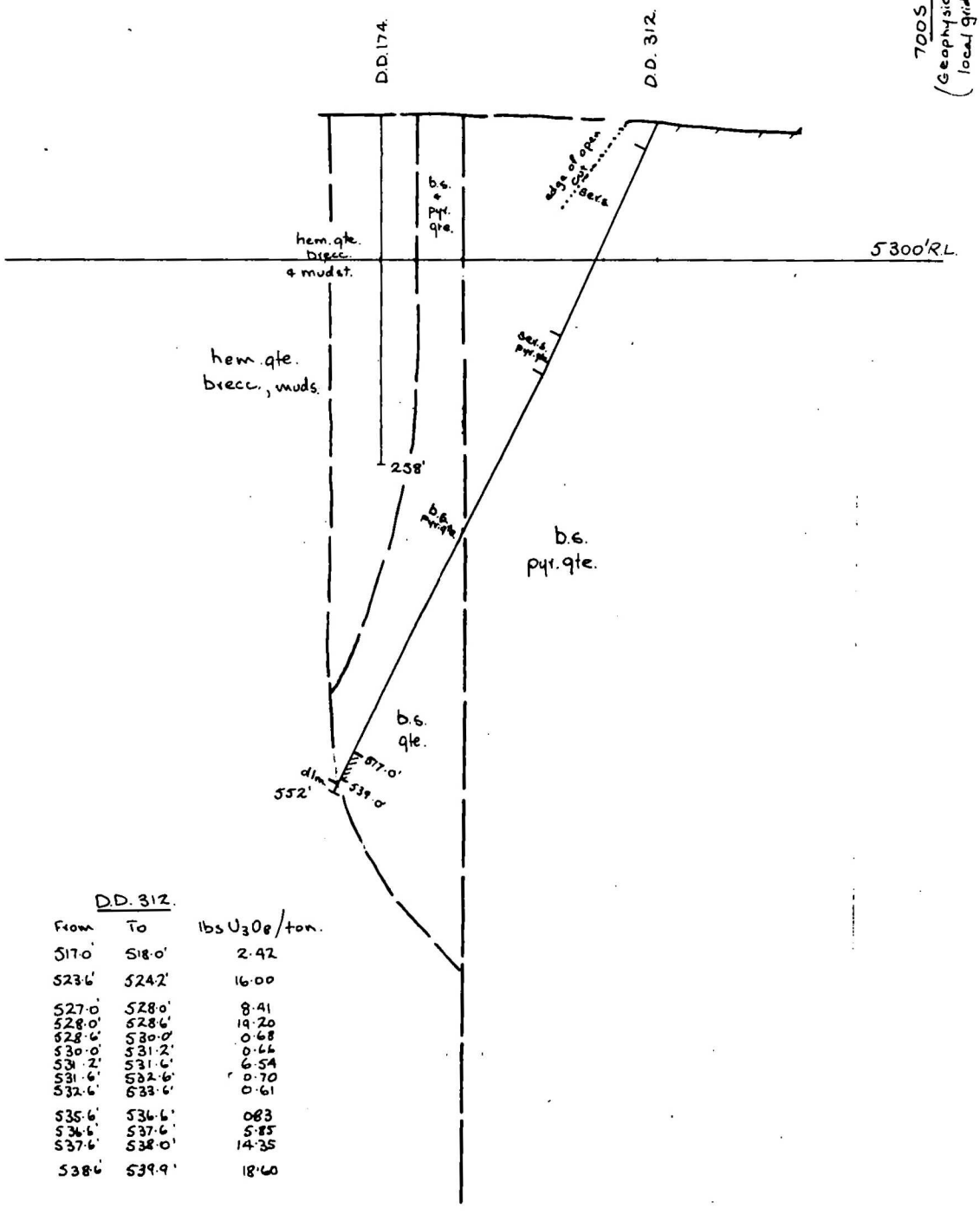
SCALE 1" = 100'

Record 1967/150

D52/A/172

D.D.H's 174, 312

700S (Geophysical local grid)



D.D. 312.

From	To	lbs U_3O_8/ton.
517·0'	518·0'	2·42
523·6'	524·2'	16·00
527·0'	528·0'	8·41
528·0'	528·6'	19·20
528·6'	530·0'	0·68
530·0'	531·2'	0·66
531·2'	531·6'	6·54
531·6'	532·6'	0·70
532·6'	533·6'	0·61
535·6'	536·6'	083
536·6'	537·6'	5·85
537·6'	538·0'	14·35
538·6'	539·9'	18·60

34500E (MINE GRID)

SHEET E63	SCALE 0 100FT
CO-ORDINATES N 30450·40 E 34538·61 MINE GRID.	BEARING OF SECTION 289° T LOOKING N.E
	DEPRESSION

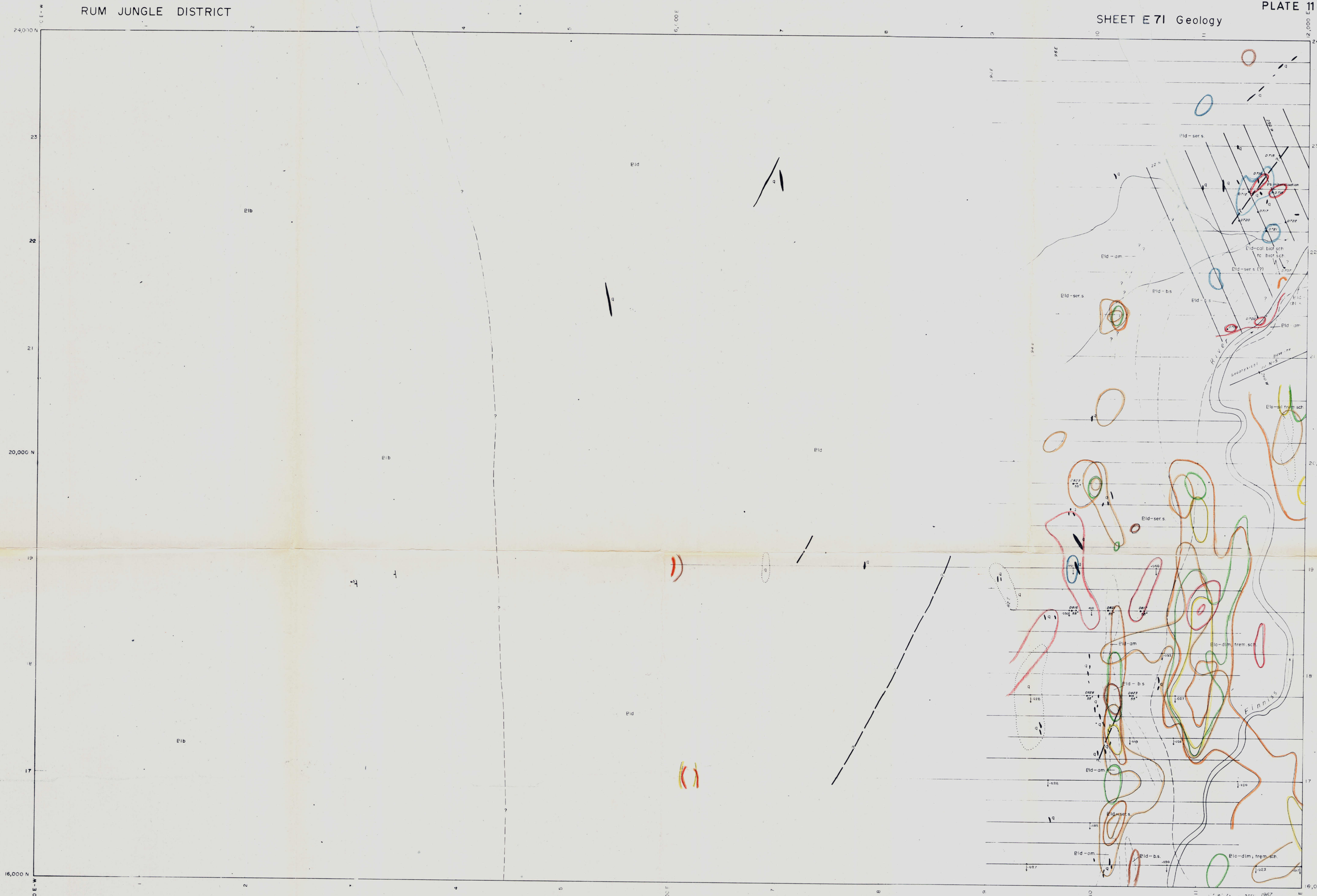
Record 1967/150

D52/A/202

RUM JUNGLE DISTRICT

PLATE 11a.

SHEET E 71 Geology



LOCATION DIAGRAM

B70	E61	E62
B80	E71	E72
B90	E81	E82

WAXIR GRID T.E.P. mine grid, North 359° E.B.C. True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: Y. Miezitis, March 1967

Record 1967/150

REFERENCE

LOWER PROTEROZOIC

Elb — BURRELL CREEK FORMATION
pale brown and purple (quartz, sericite, chlorite) slate and greywacke

Eld — GOLDEN DYKE FORMATION
b.s — black carbonaceous and/or graphitic slate; ser.s — sericitic slate, cal. biot.sch. — calc biotite schist; tc. biot.sch. — talc biotite schist (including talc chlorite sericite schist; quartz biotite slate); am — amphibolite

Elo — COOMALIE DOLOMITE
dim.-dolomite; trem.sch. — tremolite schist; sil.trem.sch. — silicified tremolite schist;

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

B.M.R. survey

400 p.p.m.	Cu
400 p.p.m.	Pb
400 p.p.m. / 3200 p.p.m.	Zn
200 p.p.m. / 3200 p.p.m.	Ni
200 p.p.m.	Co
40 p.p.m.	Mo
·036 / ·072 units	Radiometric contours

·029 Auger hole where radiometric value increases with depth (Maximum value shown at hole locality)

Vein quartz

Quartz rubble

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault

(Where location of boundaries and faults is approximate, line is broken, where inferred, queried.)

Strike and dip of bedding

D828 55° T.E.P. diamond drill hole showing direction and depression where hole is inclined

A TRIANGLE AREA

B FINNISS ANABRANCH

C TRIANGLE NORTH

D AREA 55 W WEST

Compilation based on:

(1) Ruston and Shields, Area 55 W. West, 1962 survey; B.M.R. Record No 1963/49

(2) Decker and Shatwell, Triangle Area, 1964 survey H.M.R. Record No 1965/254

(3) Berkman (T.E.P.Ltd), T.E.P.Ltd Triangle North and Finniss Anabranch Areas, 1966 survey

(4) T.E.P. Ltd diamond drill logs

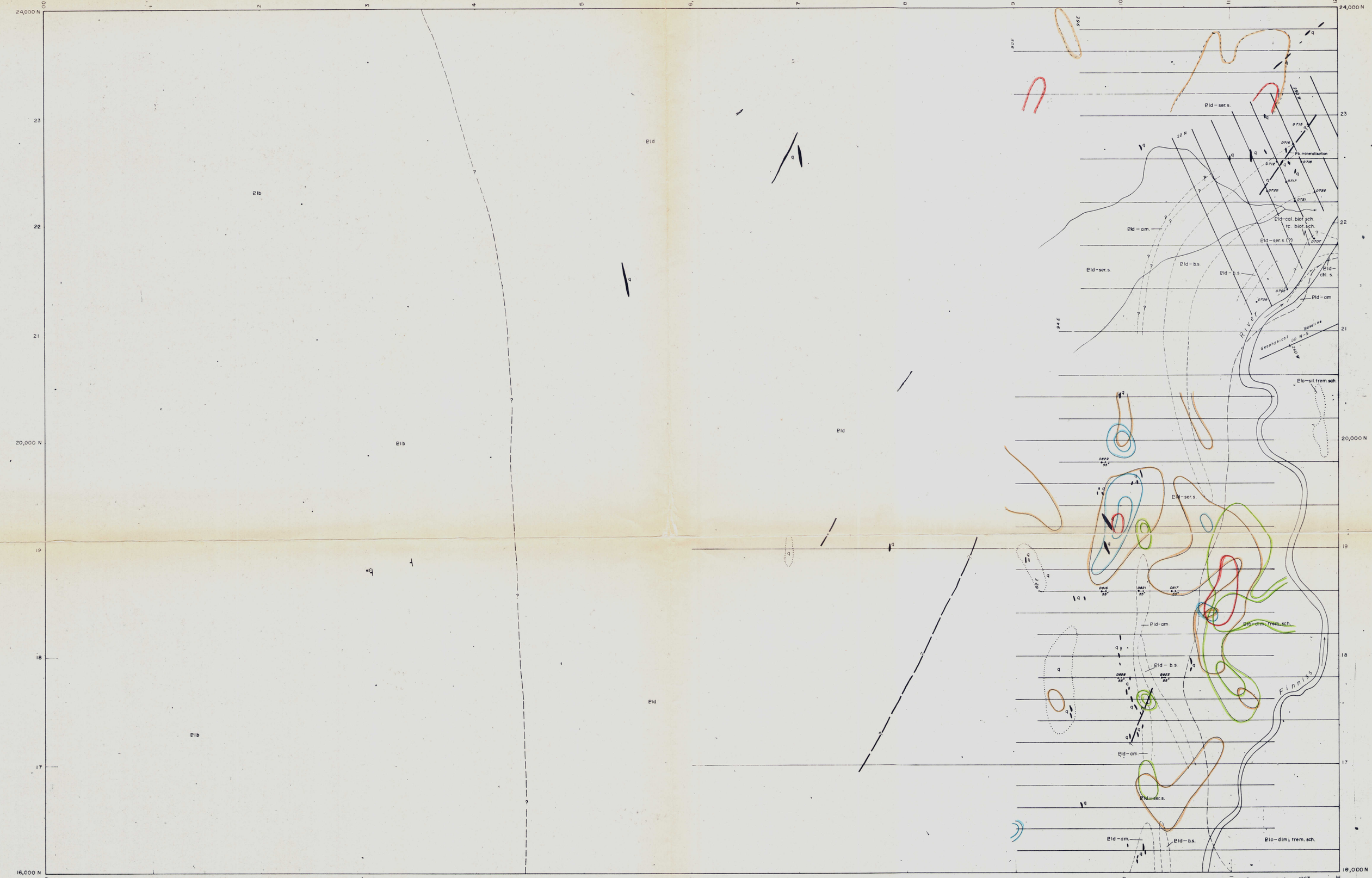
(5) Manoribanks (T.E.P.Ltd.), mapping west of Triangle Area 1966 survey

D52/A/175

PLATE 11b.

RUM JUNGLE DISTRICT

SHEET E 71 Geology



LOCATION DIAGRAM

B70	E61	E62
B80	E71	E72
B90	E81	E82

MAJOR GRID T.E.P. mine grid, North 325° 58'00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: Y. Miezitis, March 1967

REFERENCE

LOWER PROTEROZOIC

Plb BURRELL CREEK FORMATION
pale brown and purple (quartz, sericite, chlorite) slate and greywacke

Pld GOLDEN DYKE FORMATION
b.s – black carbonaceous and/or graphitic slate; ser. s – sericitic slate, cal. biot. sch. – calc biotite schist; tc. biot. sch. – talc biotite schist (including talc chlorite sericite schist; quartz biotite slate); am. – amphibolite.

Plo COOMALIE DOLOMITE
dim. – dolomite; trem. sch. – tremolite schist; sil. trem. sch. – silicified tremolite schist;

SCALE

1 mile

1 inch

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

T.E.P. Ltd survey

200 p.p.m. / 400 p.p.m.	Cu
200 p.p.m. / 400 p.p.m.	Pb
200 p.p.m. / 3200 p.p.m.	Zn
200 counts/sec	Radiometric contour

q Vein quartz

q Quartz rubble

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault
(Where location of boundaries and faults is approximate, line is broken, where inferred, queried)

Strike and dip of bedding

DB26 55° T.E.P. diamond drill hole showing direction and depression where hole is inclined

PEGGED GRIDS

A. TRIANGLE AREA

B. FINNISS ANABRANCH

C. TRIANGLE NORTH

D. AREA 55 W. WEST.

Compilation based on:

(1) Ruston and Shields, Area 55 W. West, 1962 survey, B.M.R. Record No. 1963/49

(2) Dodson and Shatwell, Triangle Area, 1964 survey B.M.R. Record No. 1965/254

(3) Bertmon (T.E.P. Ltd), T.E.P. Ltd. Triangle North and Finniss Anabranch Areas, 1966 survey

(4) T.E.P. Ltd. diamond drill logs.

(5) Hunterbanks (T.E.P. Ltd.), mapping west of Triangle Area 1966 survey.

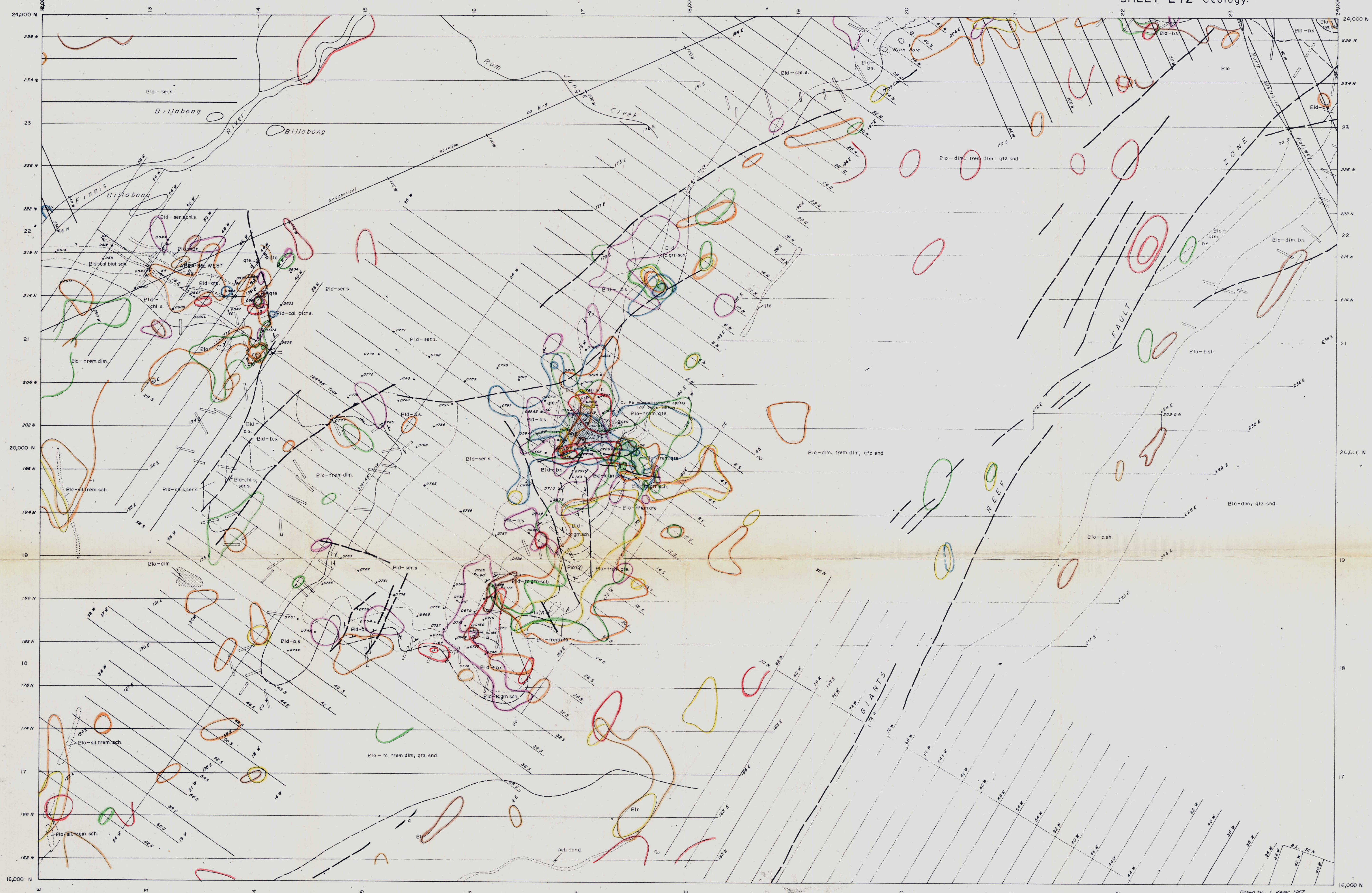
Record 1967/150

D 52/A/176

PLATE 12a

RUM JUNGLE DISTRICT

SHEET E 72 Geology.



E61	E62	E63
E71	E72	E73
E81	E82	E83

LOCATION DIAGRAM

REFERENCE

MAJOR GRID T E P mine grid, North 359°58'00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: D.O. Shatwell 1966

Amended by: Y. Miezitis May 1967

Record 1967/150

LOWER PROTEROZOIC

Ɛld GOLDEN DYKE FORMATION
ser. s.– sericitic slate, schist; b.s.– black carbonaceous and/or graphitic slate, schist; chl. s.– chloritic siltstone, slate, schist; tc. grn. sch.– talcose greenschist. (talcose sericite schist, slate; talcose and biotitic chlorite schist, slate and various dolomitic biotite–talc schist, slate); cal. biot. sch. – calc biotite schist (biotite–calcite–feldspar schist; chlorite–calcite slate, siltstone; mica slate); qte.– quartzite.

Ɛla MASSON FORMATION
ACACIA GAP TONGUE
py. qte.– pyritic quartzite; b.s.– black slate.

Ɛlo COOMALIE DOLOMITE
dlm. – dolomite; tc. trem. dlm. – talcose tremolitic dolomite; sil. trem. sch. – silicified tremolitic schist; trem. qte. – tremolitic quartzite; b. sh. – black shale; qtz. snd. – quartz sand.

Ɛlr CRATER FORMATION
peb. cong. – pebble conglomerate
Undifferentiated arkose, pebble conglomerate

400 0 400 800 1200 Feet

400 ft to 1 inch

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

B.M.R. survey

400 p.p.m. / 3200 p.p.m.	Cu	
400 p.p.m. / 3200 p.p.m.	Pb	
400 p.p.m. / 3200 p.p.m.	Zn	
200 p.p.m.	Ni	
200 p.p.m.	Co	
200 p.p.m.	V	
40 p.p.m.	Mo	
·036 / ·072 units	Radiometric contours	

T.E.P. Ltd survey

400 p.p.m. Zn

Mapped outcrop and rock exposure

Base metal mineralisation

Vein quartz

Quartz rubble

Sink hole

D 52/A/177

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault

(Where location of boundaries and faults is approximate, line is broken, where inferred, queried.)

Strike and dip of bedding

Strike and dip of foliation

Plunge of minor anticline

Plunge of minor syncline

D725 T. E. P. diamond drill hole showing direction and depression where hole is inclined.

D59A2 A M & S diamond drill hole

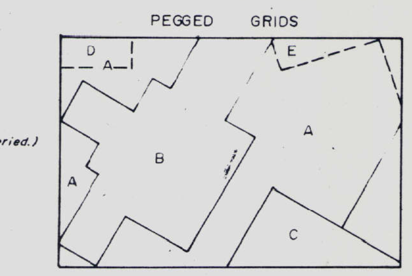
D.G.17 B.M.R. diamond drill hole

C 166 Churn drill hole (T.E.P.)

Bulldozed costean

Trig. station

PEGGED GRIDS



A. TRIANGLE AREA

B. AREA '55'

C. ZETA AREA

D. FINNISS ANABRANCH

E. BROWNS S.W.

Compilation based on:

(1) T.E.P. Ltd. geological data of Area 55 to Area 55 West.

(2) Ruxton and Shields, Area 55 to Area 55 West, 1961–1962 surveys, B.M.R. Record Nos. 1963/49 & 1963/131.

(3) Pritchard, Area 55 1963 mapping, B.M.R. Record No 1964/150.

(4) Yeaman and Pritchard, Browns S.W. to Area 55 1963 survey, B.M.R. Record No 1965/113

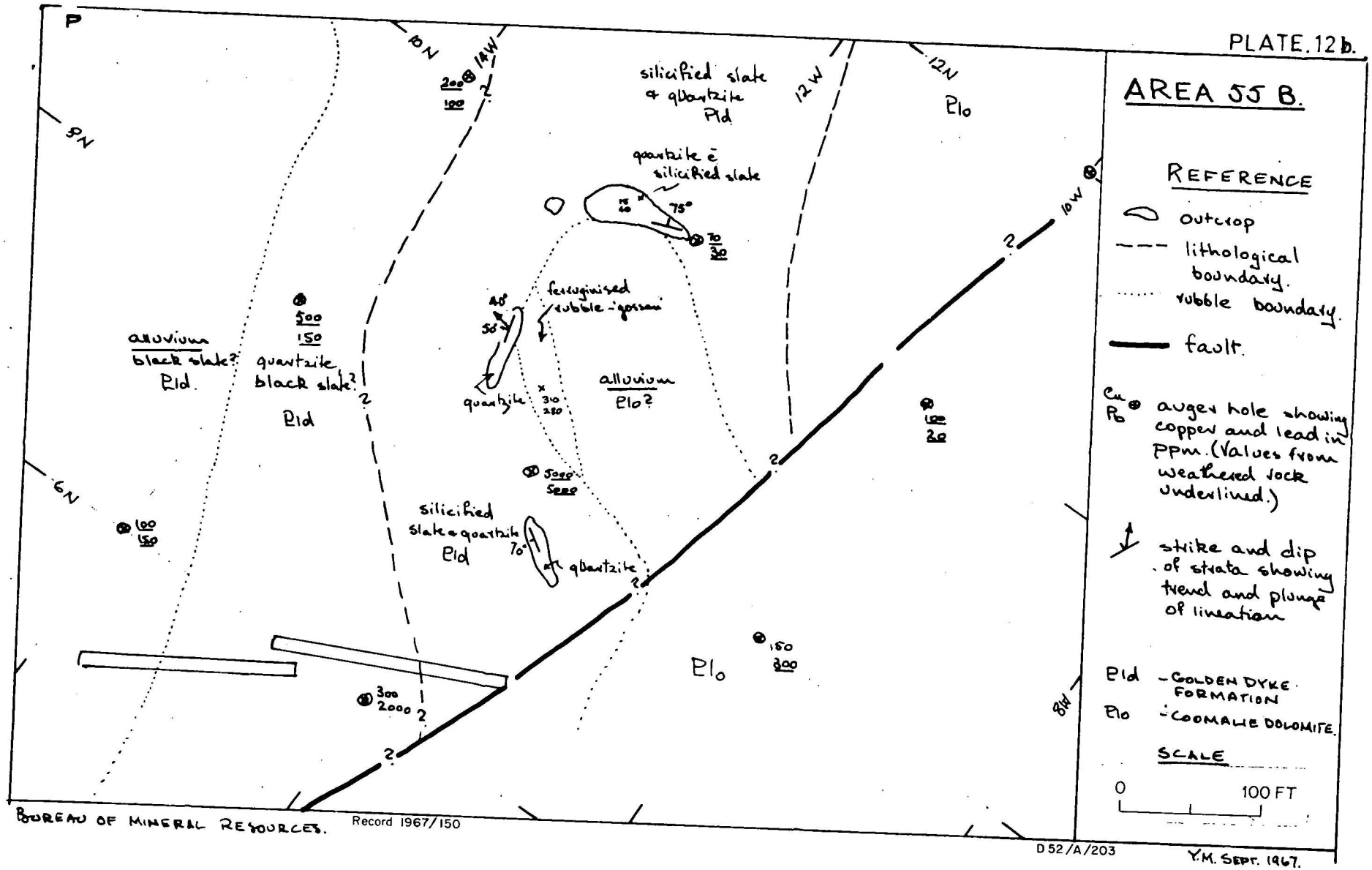
(5) Spratt (T.E.P. Ltd.), 1964 survey Browns S.W.

(6) Dodson and Shatwell, Triangle Area 1964 survey, B.M.R. Record, No. 1965/254

(7) Spratt (T.E.P. Ltd), Triangle Area 1965 survey

(8) Berkman (T.E.P. Ltd), Finniss–Anabranch 1966 survey.

PLATE. 12b.



BUREAU OF MINERAL RESOURCES. Record 1967/150

D 52/A/203

Y.M. SEPT. 1967.

PLATE 13

RUM JUNGLE DISTRICT

SHEET E 73 GEOLOGY

Plo — pyr qte; b.s.

Pld — b.s.

Plo - b.sh

Plo - dlm

ferr. brecc.

qtz.qte

qtz. mic. sch.

(? Agr - sheared granite ?)

Agr

Plr // - hem bld // cong

Plr // grt

Plr - hem bld cong

Plr - grt.

Plr - hem. bld cong.

Plr - peb. cong.

Plr - qte

Plo

Plr

Plr - grw, grts

Plr - qte

(?) Pll

Ple

NORTH AUSTRALIAN RAILWAY

Drawn by P.G.White 1969.

E62 E63 E64
E72 E73 E74
E82 E83 E84

REFERENCE

TERTIARY

ferr.brecc. - ferruginised breccia (laterite)

PROTEROZOIC

LOWER

Pld GOLDEN DYKE FORMATION
b.s. – black carbonaceous and/or graphitic slate.

Plm MASSON FORMATION
ACACIA GAP TONGUE
b.s. – black carbonaceous and/or graphitic slate; pyr. qte. – pyritic quartzite

Plo COOMALIE DOLOMITE
dlm. – dolomite, b.sh – black shale.

Plr CRATER FORMATION
grt. – grits, hem. bld. cong. – hematitic boulder conglomerate; grw – greywacke, peb. cong. – pebble conglomerate, qte. – quartzite

Pli CELIA DOLOMITE
undifferentiated ferruginised and silicified dolomite.

Ple BEESTON'S FORMATION
undifferentiated orkose, greywacke, conglomerate

UNCONFORMITY

ARCHAEAN

Agr RUM JUNGLE COMPLEX
undifferentiated granite, gneiss, (sheared granite?); qtz. m.c. sch — quartz mica schist.

SCALE

Mapped outcrop and rock exposure

Vein quartz

qtz, qte: vein quartz and quartzite

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault
(where location of boundaries, and faults is approximate, line is broken; where inferred, queried.)

Dip and strike of bedding

Bulldozed costean.

PEGGED GRIES

A. BROWNS S.W. AREA

B. TRIANGLE AREA

C. CRATER LINE SURVEY

Compilation based on:
(1) MacKay, Gales and Carter, 1950-51 mapping (B.M.R. map N.T. 476-2)
(2) Spratt (T.E.P. Ltd) Brown's S.W. 1964 survey
(3) Marjoribanks (T.E.P. Ltd) Crater Survey 1967

Compiled by Y. Miezitis 1967

Record 1967/150

D 52/A/178

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

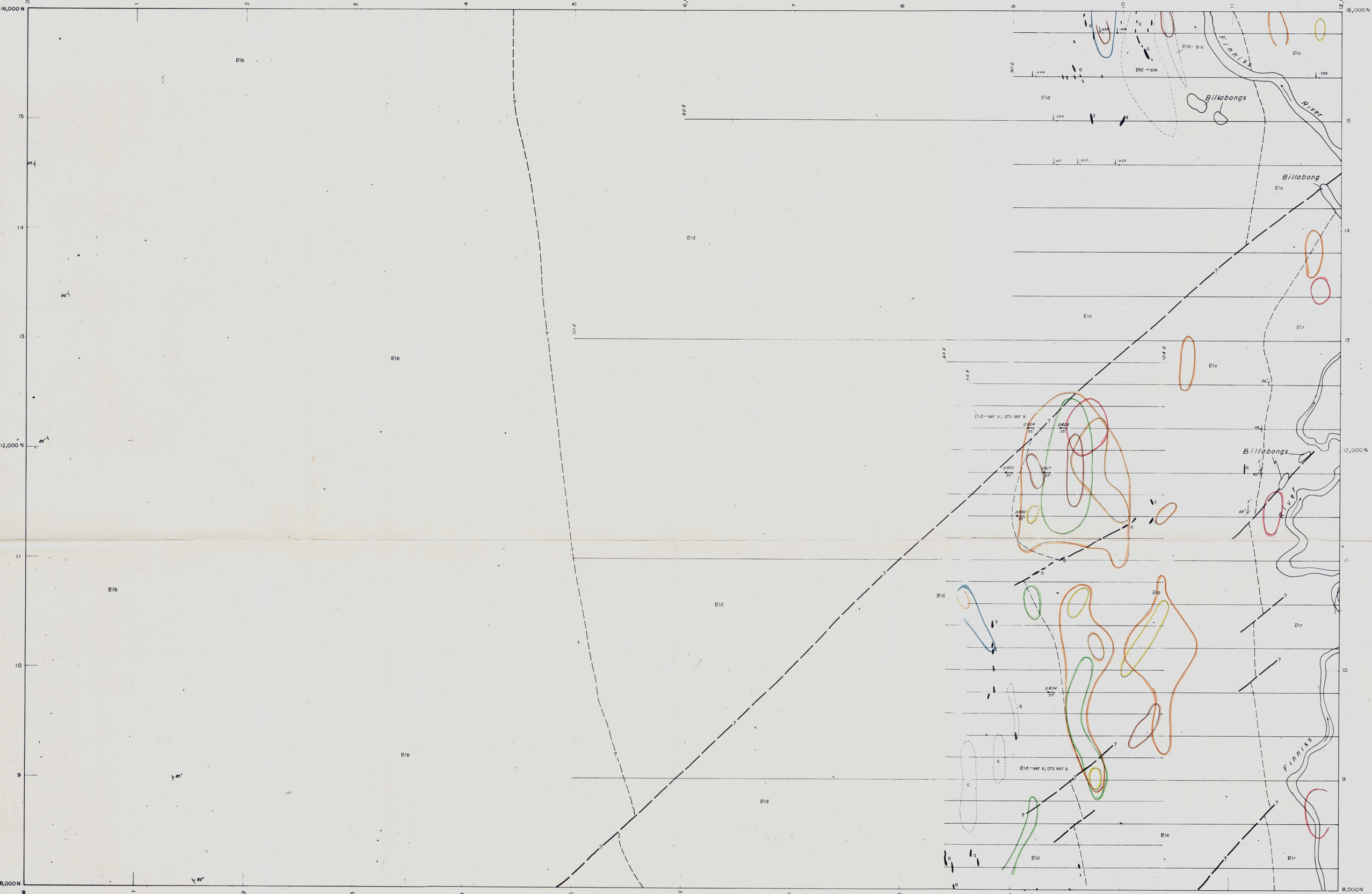
400 ppm Ni

140 counts/minute radiometric contour

PLATE 14a.

RUM JUNGLE DISTRICT

SHEET E 81 Geology



LOCATION DIAGRAM

B80	E71	E72
B90	E81	E82
B100	E91	E92

MAJOR GRID T.E.P. mine grid, North 359°58'00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: Y. Miezitis, March 1967.

Record 1967/150

REFERENCE

LOWER PROTEROZOIC

Elb BURRELL CREEK FORMATION
pale brown and purple (quartz, sericite, chlorite) slate and greywacke.

Eld GOLDEN DYKE FORMATION
b.s. – black carbonaceous and/or graphitic slate; ser.s. – sericitic slate; qtz.ser.s. – quartz sericite slate. am – amphibolite.

COOMALIE DOLOMITE

Elo *Undifferentiated dolomite, tremolite schist.*

Elr. CRATER FORMATION
Undifferentiated siltstone, arkose, conglomerate.

SCALE:
0 400 800 1600 Feet
400 ft to 1 inch

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

B.M.R. survey
- 400 p.p.m. Cu
- 400 p.p.m. Pb
- 400 p.p.m. Zn
- 200 p.p.m. Ni
- 200 p.p.m. Co
- 40 p.p.m. Mo
- .036 units Radiometric contours

Auger hole where radiometric value increases with depth (Maximum value shown at hole locality)

Vein quartz

Quartz rubble

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault

(Where location of boundaries and faults is approximate, line is broken, where inferred, queried.)

Strike and dip of bedding showing trend and plunge of lineation.

T.E.P. diamond drill hole showing direction and depression where hole is inclined

PEGGED GRIDS

A. TRIANGLE AREA.

B. TRIANGLE SOUTH

Compilation based on:

(1) Dodson and Shatwell, Triangle Area 1964 survey, B.M.R. Record 1963/49.

(2) Berkman (T.E.P. Ltd), T.E.P. Ltd Triangle South Area, 1966 survey.

(3) T.E.P. Ltd diamond drill logs.

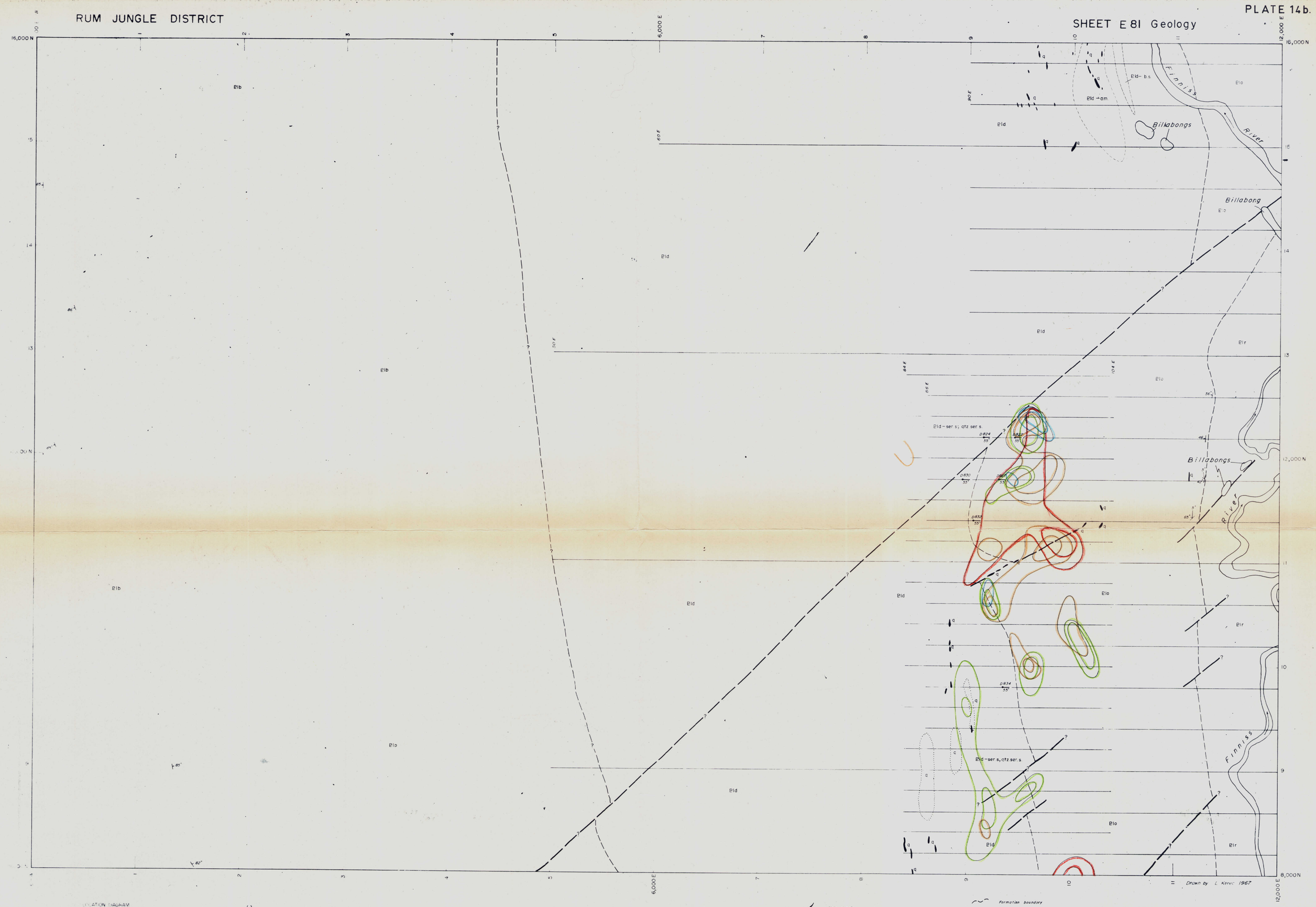
(4) Marjoribanks (T.E.P. Ltd) mapping west of Triangle Area 1966 survey.

D52/A/179

PLATE 14b.

RUM JUNGLE DISTRICT

SHEET E 81 Geology



LOCATION DIAGRAM

B80	E71	E72
B90	E81	E82
B100	E91	E92

REFERENCE

Grid: Transverse Mercator projection. Grid North 359°58' True

Department of Mines, Industry and Geophysics

Cartographer: Y. Miezitis, March 1967.

Record 1967/150

LOWER PROTEROZOIC

Elb — BURRELL CREEK FORMATION
pale brown and purple (quartz, sericite, chlorite) slate and greywacke.

Eld — GOLDEN DYKE FORMATION
b.s. — black carbonaceous and/or graphitic slate; ser.s. — sericitic slate, qtz.ser.s. — quartz sericite slate, am. — amphibolite

Elc — COOMALIE DOLOMITE
Undifferentiated dolomite, tremolite schist

Elr — CRATER FORMATION
Undifferentiated siltstone, arkose, conglomerate

SCALE
4000 0 8000 12000 feet
4000 0 2000 4000 metres

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

T.E.P. Ltd survey

200 p.p.m. / 400 p.p.m.	Cu
200 p.p.m. / 400 p.p.m.	Pb
400 p.p.m.	Zn
100 counts/sec / 200	Radiometric contour

q — Vein quartz

q — Quartz rubble

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault
(Where location of boundaries and faults is approximate, line is broken, where inferred, queried.)

Strike and dip of bedding showing trend and plunge of lineation

T.E.P. diamond drill hole showing direction and depression where hole is inclined

PEGGED GRIDS

A. TRIANGLE AREA.

B. TRIANGLE SOUTH

Compilation based on:

(1) Dodson and Shatwell, Triangle Area 1964 survey, B.M.R. Record 1965/49.

(2) Berkman (T.E.P. Ltd), T.E.P. Ltd. Triangle South Area, 1966 survey.

(3) T.E.P. Ltd. diamond drill logs.

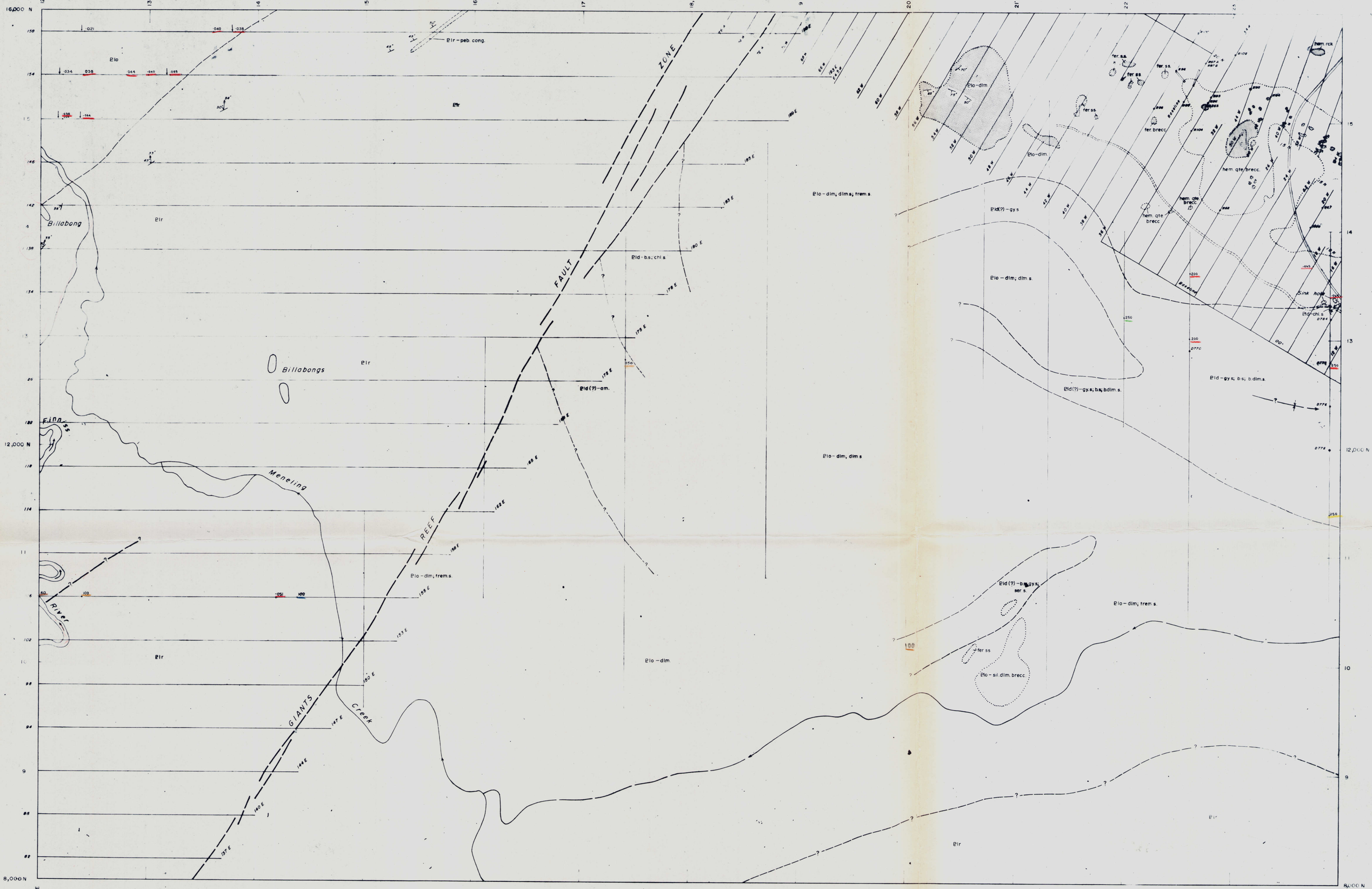
(4) Marjoribanks (T.E.P. Ltd) mapping west of Triangle Area 1966 survey.

D 52/A/180

PLATE 15.

RUM JUNGLE DISTRICT

SHEET E 82 Geology



LOCATION DIAGRAM

E71	E72	E73
E81	E82	E83
E91	E92	E93

REFERENCE

MAJOR GRID: T.E.P. mine grid, North 359° 58' 00" True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: Y. Miezitis November 1966

Record 1967/150

? TERTIARY

fer.brecc. — ferruginous breccia, mostly pisolitic (laterite)

fer ss. — ferruginous sandstone (laterite)

? LOWER PROTEROZOIC

hem qte.brecc — hematitic quartzite breccia

hem.rck — hematitic rock; iron oxides, mainly hematite

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Pld — b.s. — black carbonaceous and/or graphitic slate, schist, shale; b.dim.s. — black dolomitic slate; chl.s. — chloritic slate, schist, sec.s. — sericitic slate, schist; gy.s. — grey slate; am — amphibolite.

COOMALIE DOLOMITE

Plo — dim. — crystalline and slaty dolomite; dim.s. — dolomitic slate; trem.s. — tremolitic slate, schist; sil.dim.brecc. — silicified dolomitic breccia

CRATER FORMATION

Plr — peb.cong. — pebble conglomerate; undifferentiated arkose, hematitic boulder conglomerate.

SCALE

40 0 400 800 1200 Feet

ANOMALOUS GEOCHEMICAL AND SUBSURFACE RADIOMETRIC SPOT VALUES

BMR and T.E.P. Ltd surveys

- + 200 ppm Cu
- + 100 ppm Pb
- + 100 ppm Zn
- + 200 ppm Ni
- + 200 ppm Co
- + 40 ppm Mo
- + ·036 units
- + 200 counts/min

Radiometric

Auger hole where radiometric value increases with depth (Maximum value shown at hole locality)

Mapped outcrop and rock exposure

Phosphate rock outcrop

Sink hole

Formation boundary

Lithological boundary

Rock outcrop and rubble boundary

Fault

Axis of syncline (Where location of boundaries, folds and faults is approximate, line is broken, where inferred, queried)

Dip and strike of bedding

Dip and strike of bedding indicating plunge and strike of lineation

T.E.P. diamond drill hole

Rotary drill hole (B.M.R.)

Bulldozed costean

Formed road

Vehicle track

Drawn by ... March 1967

D 52/A/181

PEGGED GRIDS

A TRIANGLE AREA

B ZETA

C. FLYNN

D. RUM JUNGLE CREEK

E. WATERHOUSE NORTH

Compilation based on

(1) Pritchard et al 1963 phosphate survey, B.M.R. Record 1963 **

(2) Dodson and Shatwell, Triangle Area 1964 survey, B.M.R. Record 1965/254

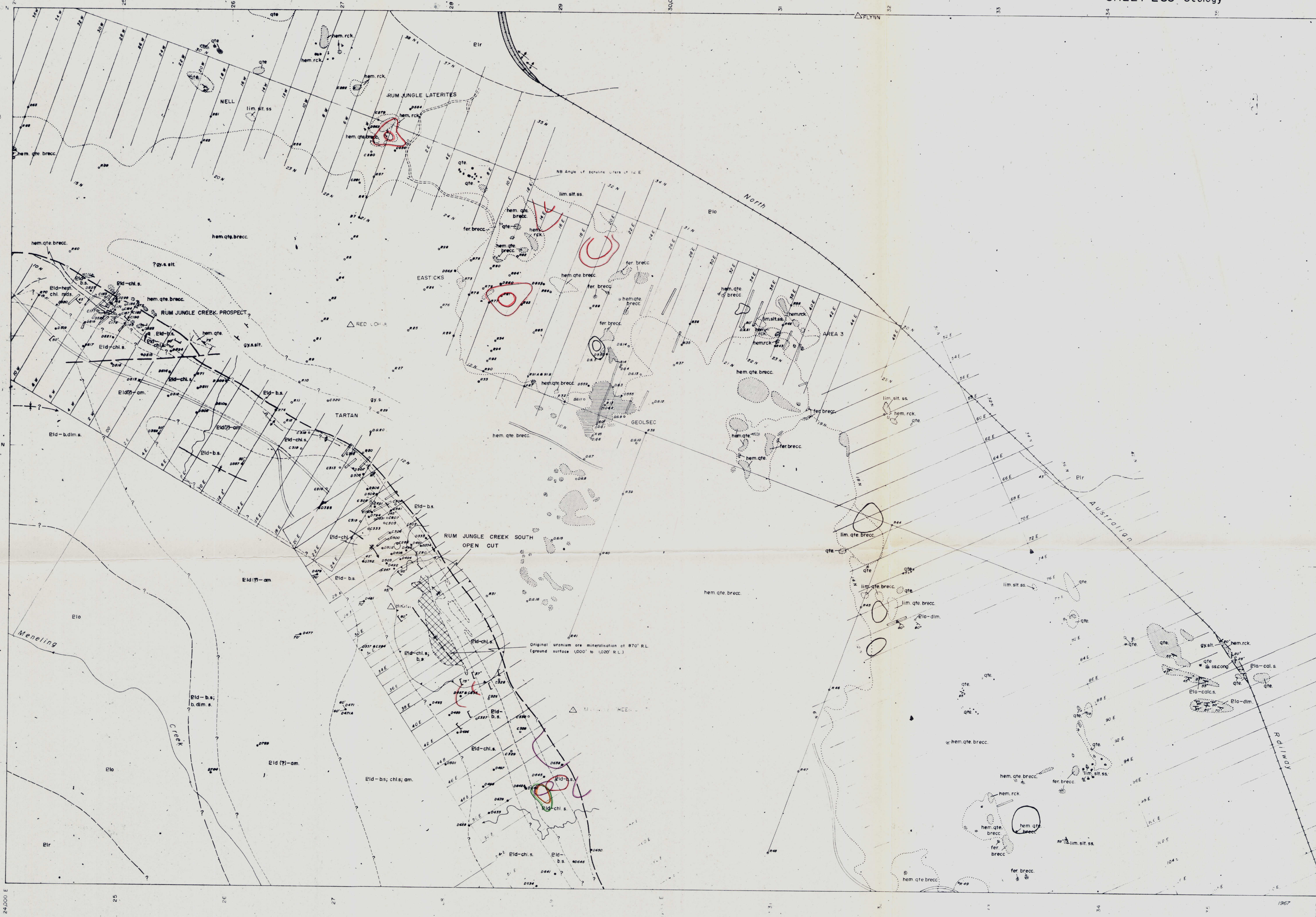
(3) Spratt (T.E.P. Ltd) Waterhouse North Area, 1964 survey

(4) T.E.P. Ltd geological data from diamond and churn drill holes in Zeta Area

RUM JUNGLE DISTRICT

PLATE 16 a.

SHEET E83 Geology



E 72	E73	E74
E 82	**E83**	E84
E92	E93	E94

REFERENCE

? TERTIARY

fer. brecc. — ferruginous breccia, mostly pisolitic. (laterite)

fer. ss. — ferruginous sandstone. (laterite)

? LOWER PROTEROZOIC

hem. qte. brecc. — hematitic quartzite breccia.

hem. rck. — hematitic rock, iron oxides, mainly hematitic.

qte. — quartzite / quartzite breccia.

hem. qte. — hematitic quartzite.

ss. cong. — sandstone and conglomerate.

lim. qte. brecc. — limonitic quartzite breccia.

lim. slt. ss. — limonitic siltstone and sandstone.

gy. s. slt. — grey slate and siltstone

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Eld — *b.s. – black carbonaceous and/or graphitic slate, schist; chl. s. – chloritic slate, schist; hem. chl. mds. – hematitic chloritic mudstone; b. dlm. s. – black dolomitic slate; am. – amphibolite.*

COOMALIE DOLOMITE

Elo — *dlm. – dolomite; cal. s. – calcareous slate. Undifferentiated dolomite, tremolitic dolomite, dolomitic slat*

CRATER FORMATION

Elr — *arkose pebble conglomerate, hematitic boulder conglomerate, quartzite, slate.*

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

B.M.R. survey

400 ppm	Cu	
200 ppm	Ni	
200 ppm	V	
·036 ·072 units	Radiometric contours	

Mapped outcrop and rock exposure

Phosphate rock.

Uranium mineralisation

Vein quartz.

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault

Axis of syncline

Axis of anticline

(Where location of boundaries, folds and faults is approximate, line is broken; where inferred, queried.)

Dip and strike of bedding

Dip and strike of cleavage, schistosity

T.E.P. diamond drill hole showing direction and depression where hole is inclined

B.M.R. diamond drill hole

Rotary drill hole (B.M.R.)

Churn drill hole (T.E.P.)

Open cut boundary

Bulldozed costean

Formed road

Vehicle track

Trig. station

A. FLYNNS AREA

B. RUM JUNGLE CREEK

C. RUM JUNGLE CREEK STH

D. POWER LINE

Note: Diamond and churn drill holes within the open cut not shown

Compilation based on:

(1) T.E.P. Ltd. geological data along Rum Jungle Creek Prospect and Rum Jungle Creek South open cut line (Rum Jungle Creek South open cut geology by Berkman 1963)

(2) Ruxton and Shields 1961 and 1962 surveys, B.M.R. Records 1963/49 and 1963/131

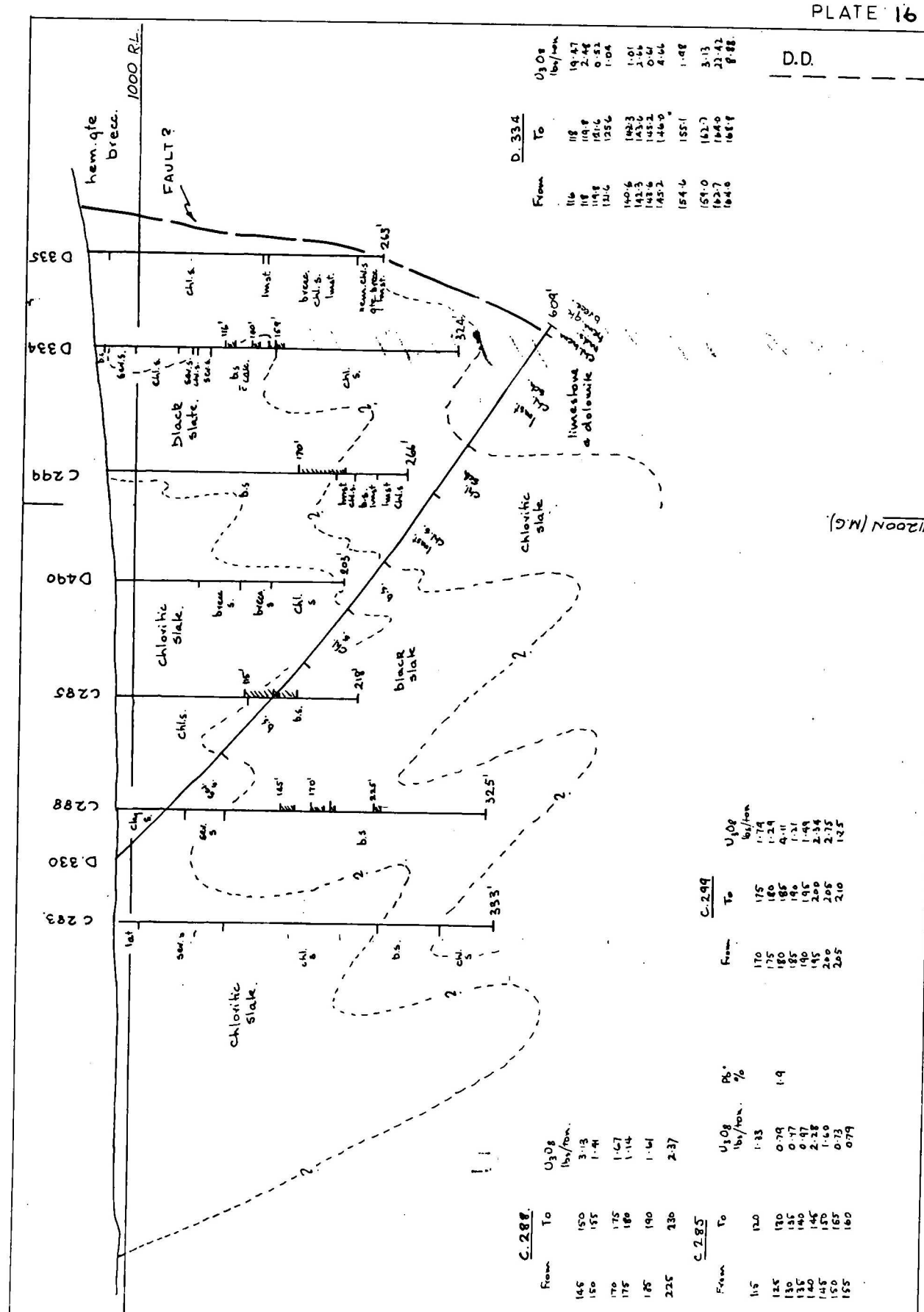
(3) Pritchard et al 1963 phosphate survey, B.M.R. Record 1963/73

Compiled by: Y. Miezitis December 1966.

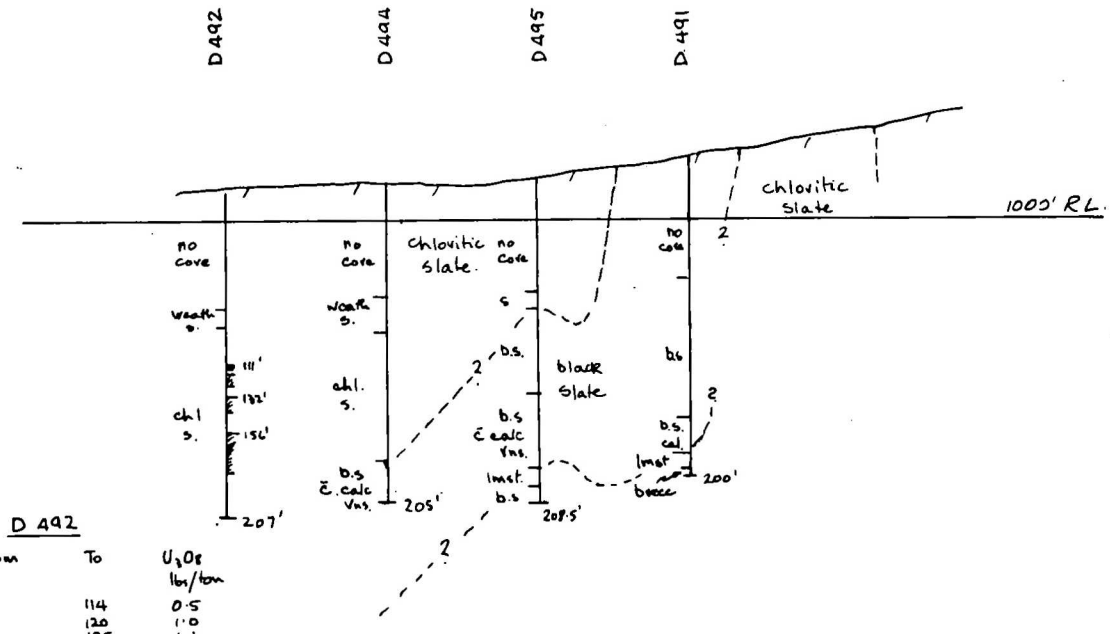
Record 1967/150

D52/A/182

PLATE 16 b.


1000 RL.
hem. qte breccia
FAULT 2
D.D.
D 335
D 334
C 294
D 490
C 285
C 288
D 330
C 283
black slate
chloritic slate
limestone & dolomite
black slate
chloritic slate
chloritic slate
1200N (M.G.)
D. 334
From To U3O8 lbs/ton
116 118 19·47
118 119·8 2·44
119·8 121·6 0·51
121·6 123·6 1·04
140·6 142·3 1·01
142·3 143·6 2·16
143·6 145·2 0·61
145·2 146·9 4·66
154·6 155·1 1·98
159·0 162·7 3·13
162·7 164·0 22·42
164·0 165·9 8·88
C. 299
From To U3O8 lbs/ton
170 175 1·74
175 180 1·29
180 185 4·11
185 190 1·21
190 195 1·99
195 200 2·34
200 205 2·75
205 210 1·25
C. 288
From To U3O8 lbs/ton
145 150 3·13
150 155 1·41
170 175 1·67
175 180 1·14
185 190 1·61
225 230 2·37
C 285
From To U3O8 lbs/ton Pb %
115 120 1·83 1·9
125 130 0·79
130 135 0·17
135 140 0·97
140 145 2·28
145 150 1·60
150 155 0·73
155 160 0·79
SHEET E83
CO-ORDINATES
N 10938
E 27863
MINE GRID.
SCALE 100FT
BEARING OF SECTION 28°T LOOKING N.W.
DEPRESSION
Record 1967/150
D52/A/204

D.D.



D 492

From	To	U_3O_8 lbs/ton
111	114	0·5
117	120	1·0
132	135	1·1
135	138	1·5
138	141	0·7
156	159	2·4
159	162	2·7
162	165	1·6
165	168	1·2
168	171	1·8
178	174	1·3
174	177	0·8
177	180	0·5

D 491

From	To	V_3O_8 lbs/ton
116	119	1·66
152	155	1·25
164	167	0·96
179	182	0·95

D 494

From	To	U_3O_8 lbs/ton
179	182	44·0

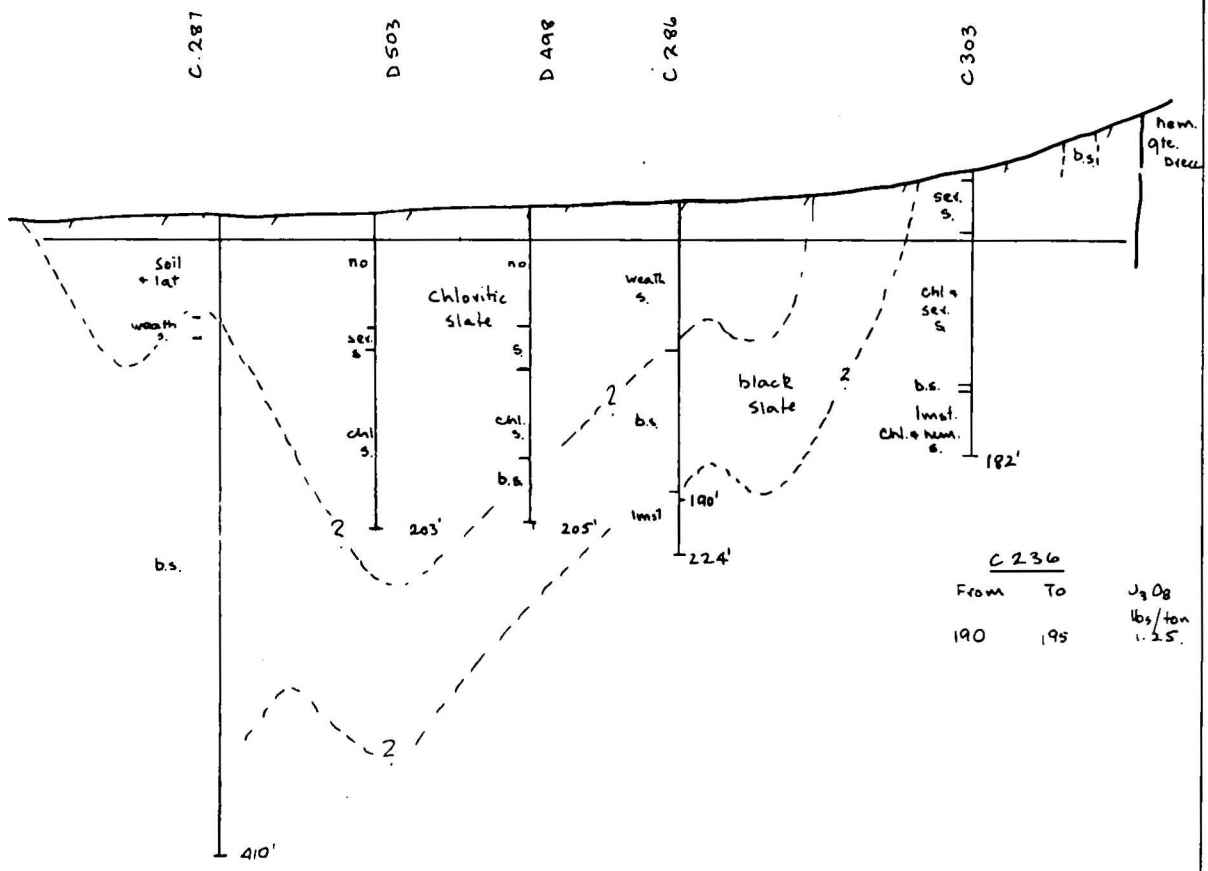
11200 N (M.G.)

SHEET E 83	SCALE 0 100 FT
CO-ORDINATES N 10489 E 27773 MINE GRID.	BEARING OF SECTION 36°T LOOKING NW
	DEPRESSION

Record 1967/150

D52/A/205

PLATE 16.d.



SHEET E83	0 SCALE 100 FT
CO-ORDINATES N 11039 E 27689 MINE GRID	BEARING OF SECTION 34°T LOOKING N.W.
	DEPRESSION

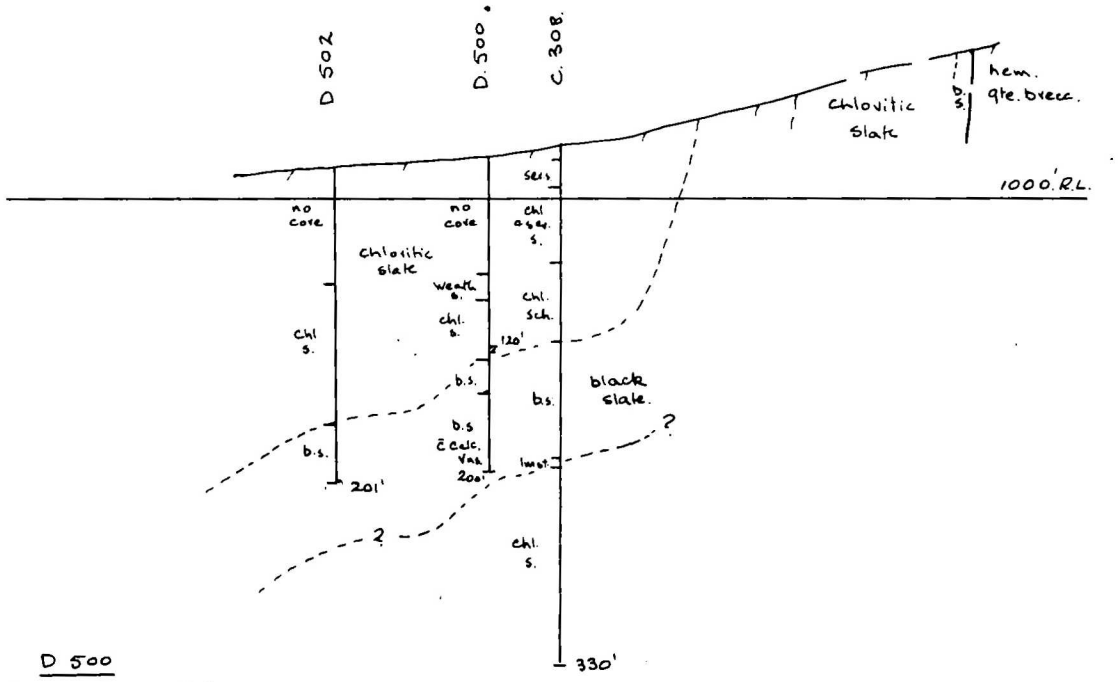
11200 V (MG).

Record 1967/150

D 52/A/206

PLATE 16. e.

D.D.



D 500

From	To	U_3O_8 lbs/ton
120	123'	1.3.

SHEET E 83	0 SCALE 100 FT
CO-ORDINATES N 11177 E 27650 MINE GRID.	BEARING OF SECTION 26°T LOOKING NW.
	DEPRESSION

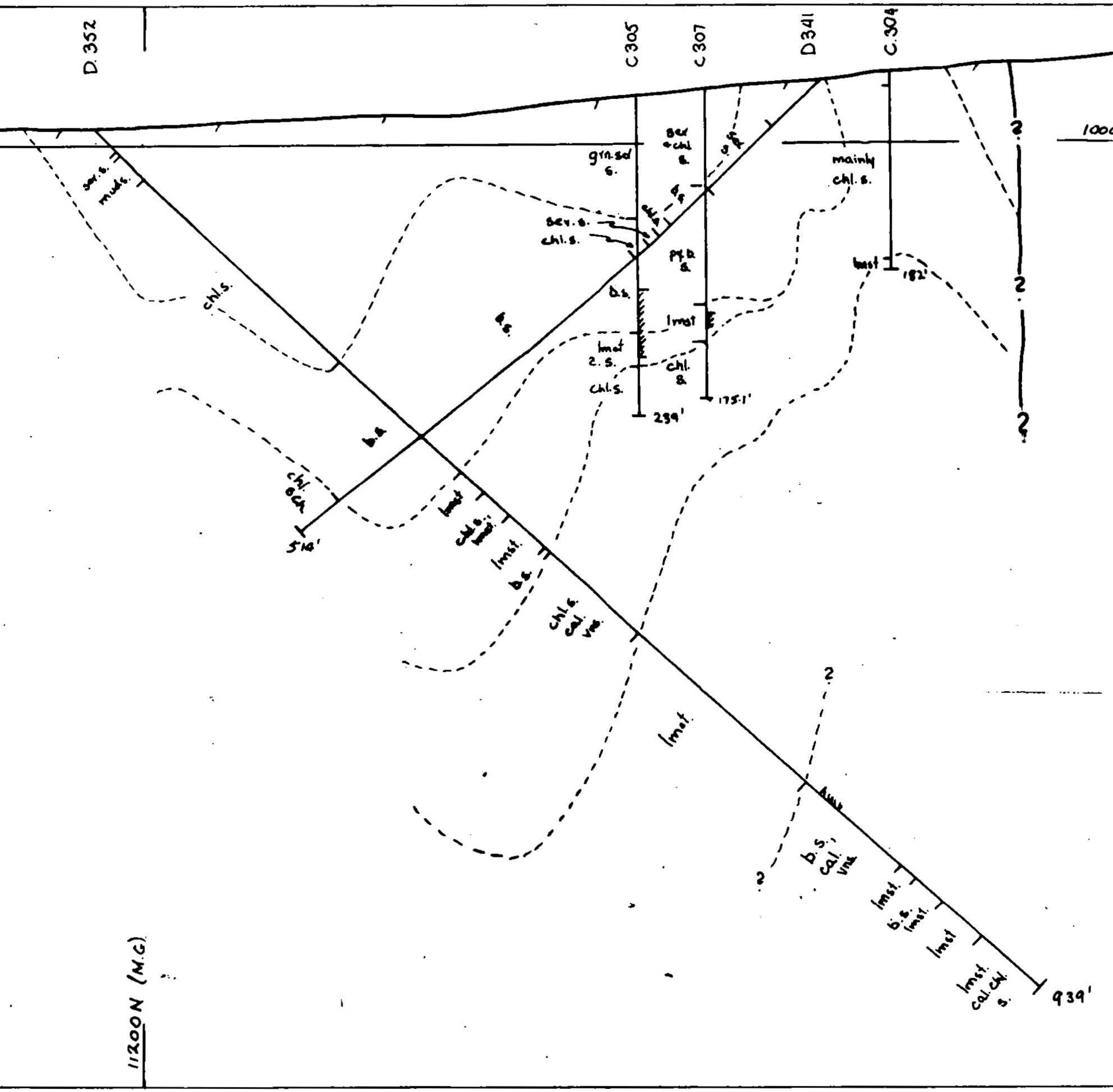
11200 N(M.G.)

Record 1967/150

D 52/A/207

PLATE 16.f.

D.D.



CD.305

From	To	lbs U_3O_8/ton
145.0	147.5	6.01
147.5	150.0	2.68
150.0	152.5	1.69
152.5	155.0	17.58
155.0	157.5	15.96
157.5	160.0	6.60
160.0	162.5	8.36
162.5	165.0	7.81
165.0	167.5	6.09
167.6	170.0	3.39
170.0	172.6	5.10
172.5	175.0	5.38
175.0	177.5	9.74
177.5	180.0	6.42
180.0	182.5	8.44
182.5	185.0	6.08
185.0	187.5	7.00
187.6	190.0	4.13
190.0	192.0	14.38
192.4	193.1	2.65
193.1	194.5	0.70
194.5	195.1	8.91
195.1	195.7	1.48
200.1	201.7	1.69
201.7	202.5	1.31
202.5	202.11	1.29
202.11	203.0	1.09
203.0	204.0	1.85

D352.

From	To	lbs U_3O_8/ton.
725.5	727.5	1.05
727.5	729.0	4.73
732.3	733.3	1.16
733.3	735.3	0.71
740.3	741.3	1.40
741.3	741.5	1.06
784.5	784.8	2.20

D341.

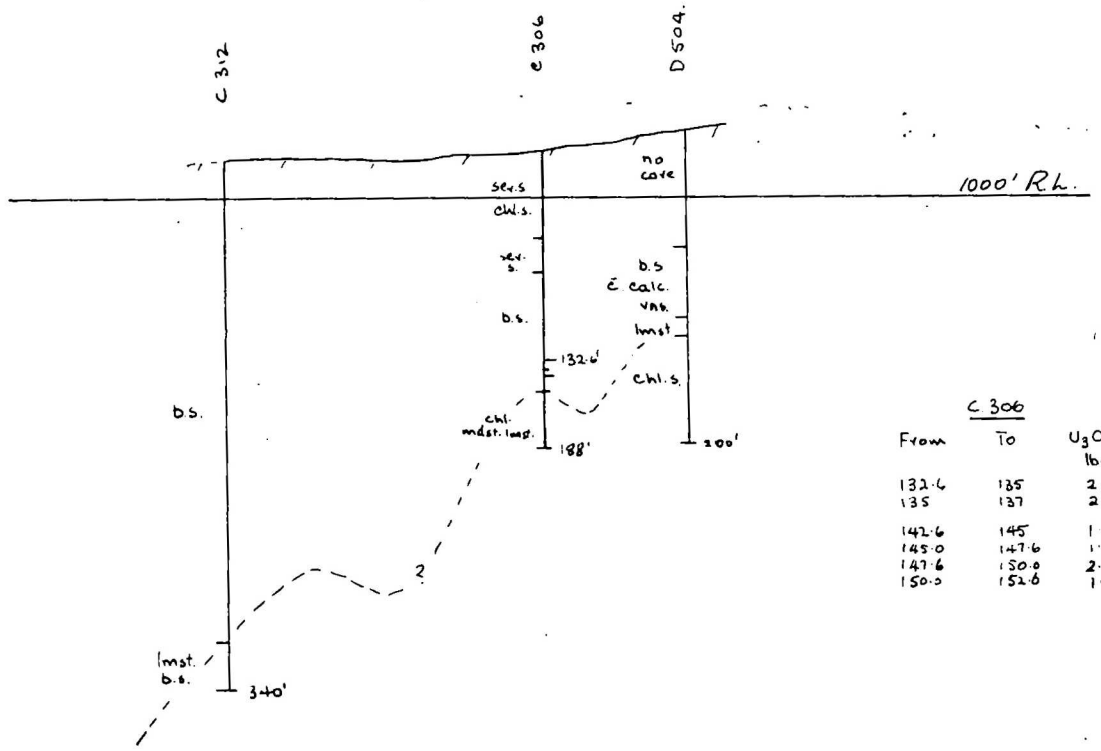
From	To	lbs U_3O_8/ton.
161.0	164.0	0.9

SHEET E 83	SCALE 0 – 100 FT
CO-ORDINATES N 10980 E 27440 MINE GRID	BEARING OF SECTION 30°T LOOKING NW DEPRESSION

Record 1967/150

D52/A/208

D.D.



C 306

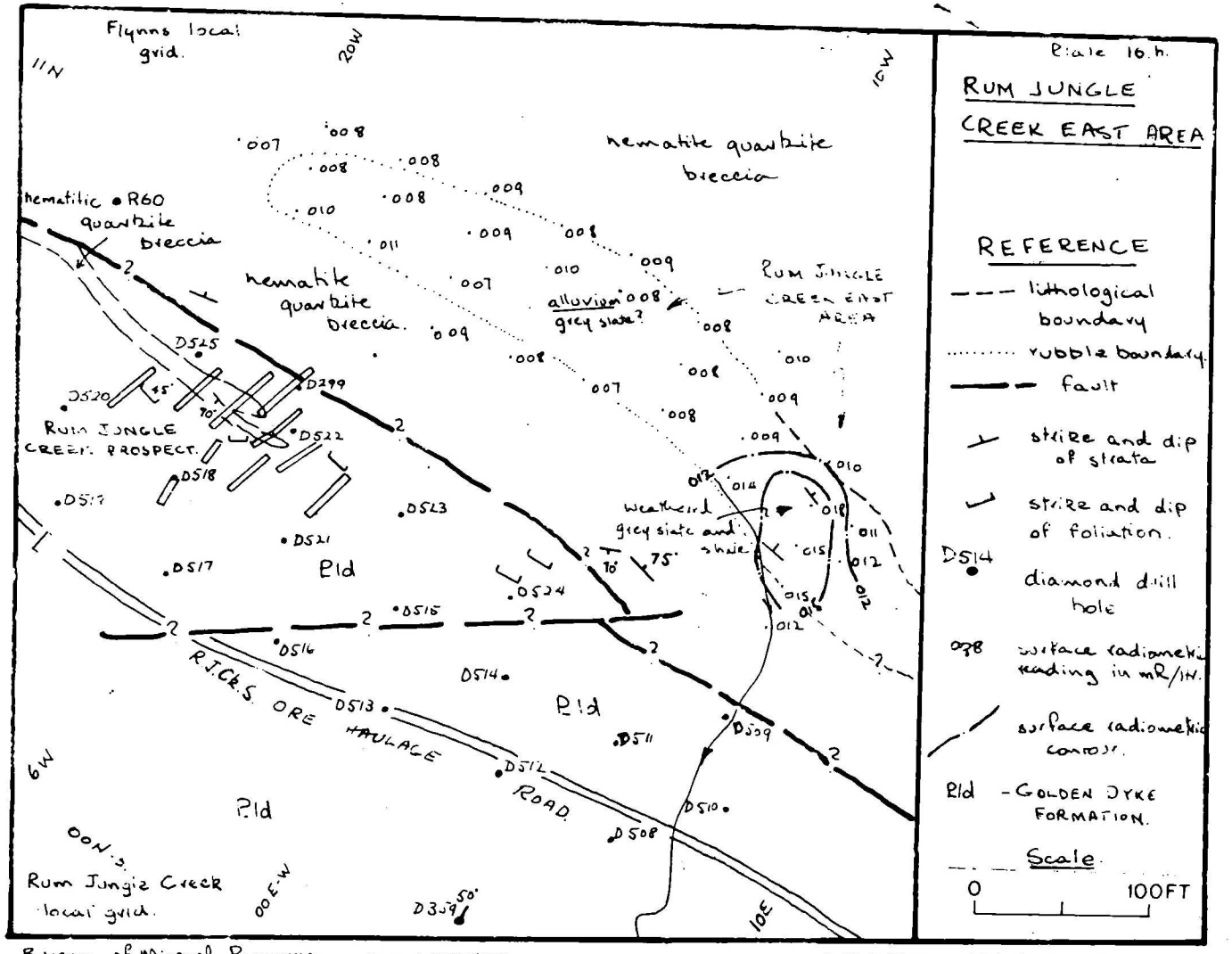
From	To	U_3O_8 lbs/ton
132·6	135	2·55
135	137	2·42
142·6	145	1·17
145·0	147·6	1·50
147·6	150·0	2·37
150·0	152·6	1·08

11200 N (M.G.)

SHEET E83	0 SCALE 100FT
CO-ORDINATES N 11584 E 27541 MINE GRID.	BEARING OF SECTION 31° LOOKING N.W.
	DEPRESSION —

Record 1967/150

D52/A/209

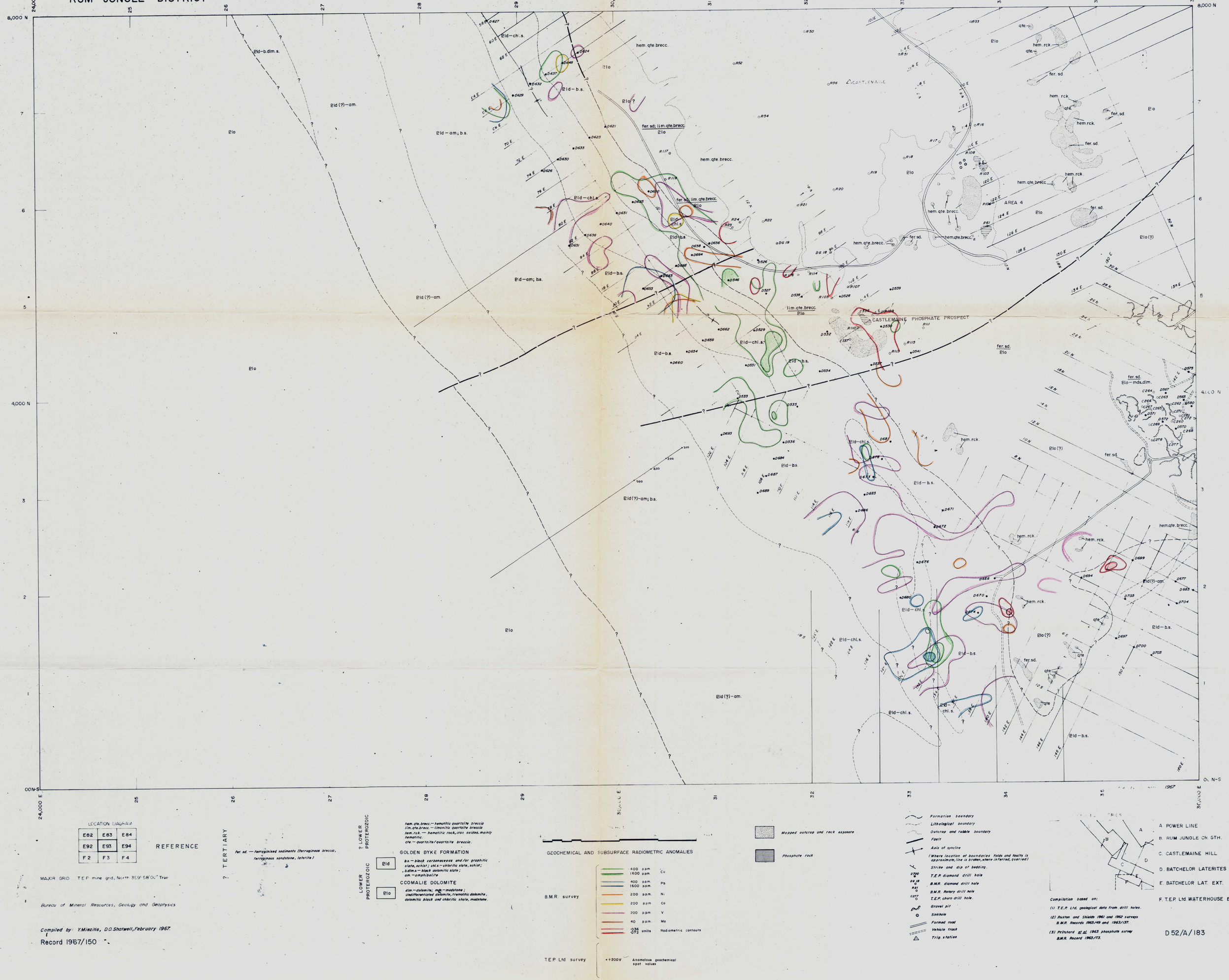


Bureau of Mineral Resources. Record 1967/150 D 52/A/201 Y.M. Sept. 1967.

PLATE 17a

RUM JUNGLE DISTRICT

SHEET E 93 Geology



LOCATION DIAGRAM

E82	E83	E84
E92	E93	E94
F2	F3	F4

REFERENCE

MAJOR GRID T.E.P. mine grid, North 35°9'58"0W. True

Bureau of Mineral Resources, Geology and Geophysics

Compiled by: Y. Miezitis, D.O. Shatwell, February 1967.

Record 1967/150

? TERTIARY

fer. sd. — ferruginised sediments (ferruginous breccia, ferruginous sandstone, laterite)

? LOWER PROTEROZOIC

hem. qte. brecc. — hematitic quartzite breccia
lim. qte. brecc. — limonitic quartzite breccia
hem. rck. — hematitic rock, iron oxides, mainly hematitic.
qte. — quartzite/quartzite breccia.

GOLDEN DYKE FORMATION

Eld — *b.s. — black carbonaceous and/or graphitic slate, schist; chl.s. — chloritic slate, schist; b.dlm.s. — black dolomitic slate; am. — amphibolite*

LOWER PROTEROZOIC

COOMALIE DOLOMITE

Elo — *dlm. — dolomite; mds. — mudstone; undifferentiated dolomite, tremolitic dolomite, dolomitic black and chloritic shale, mudstone.*

GEOCHEMICAL AND SUBSURFACE RADIOMETRIC ANOMALIES

B.M.R. survey

400 p.p.m. / 1600 p.p.m.	Cu	
400 p.p.m. / 1600 p.p.m.	Pb	
200 p.p.m.	Ni	
200 p.p.m.	Co	
200 p.p.m.	V	
40 p.p.m.	Mo	
.036 / .072 units	Radiometric contours	

T.E.P. Ltd survey

+200V — Anomalous geochemical spot values

Mapped outcrop and rock exposure

Phosphate rock

Formation boundary
Lithological boundary
Outcrop and rubble boundary
Fault
Axis of syncline
(Where location of boundaries folds and faults is approximate, line is broken, where inferred, queried)
Strike and dip of bedding.
T.E.P. diamond drill hole
B.M.R. diamond drill hole
B.M.R. Rotary drill hole
T.E.P. churn drill hole.
Gravel pit
Sinkhole
Formed road
Vehicle track
Trig. station

A. POWER LINE
B. RUM JUNGLE CR. STH.
C. CASTLEMAINE HILL
D. BATCHELOR LATERITES
E. BATCHELOR LAT. EXT.
F. T.E.P. Ltd WATERHOUSE EAST.

Compilation based on:

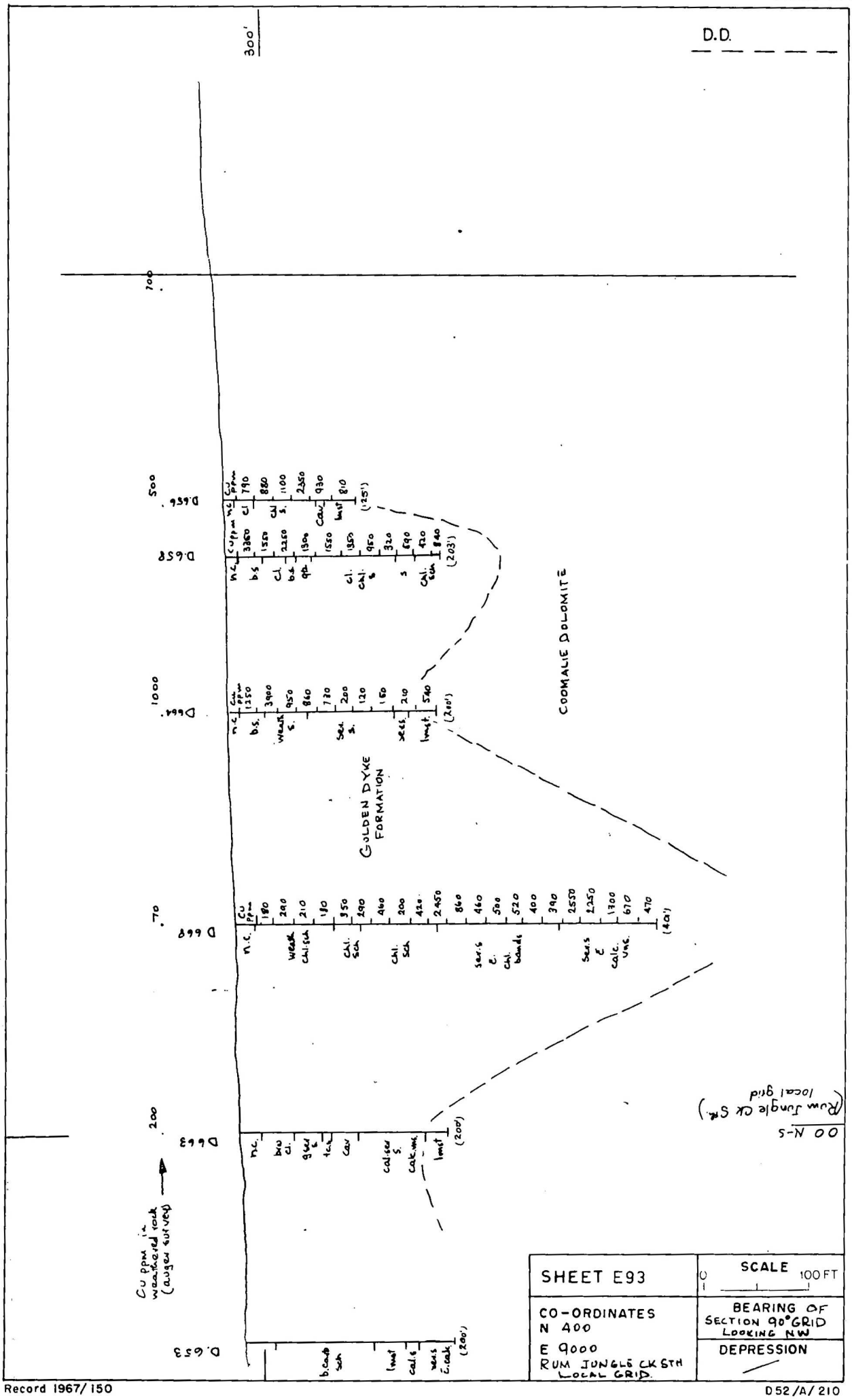
(1) T.E.P. Ltd, geological data from drill holes.

(2) Ruxton and Shields 1961 and 1962 surveys. B.M.R. Records 1963/49 and 1963/137.

(3) Pritchard et al 1963, phosphate survey B.M.R. Record 1963/73.

D 52/A/183

PLATE 17 b.


D.D.
300'
100
500
1000
700
200
D.659
D.658
D.664
D.669
D.663
D.653
COOMALIE DOLOMITE
GOLDEN DYKE FORMATION
Cu ppm in weathered rock (auger survey)
(Rum Jungle Ck Str.)
local grid
00 N-S
SHEET E93
SCALE 0 100 FT
CO-ORDINATES
N 400
E 9000
RUM JUNGLE CK STH LOCAL GRID.
BEARING OF SECTION 90° GRID LOOKING NW
DEPRESSION

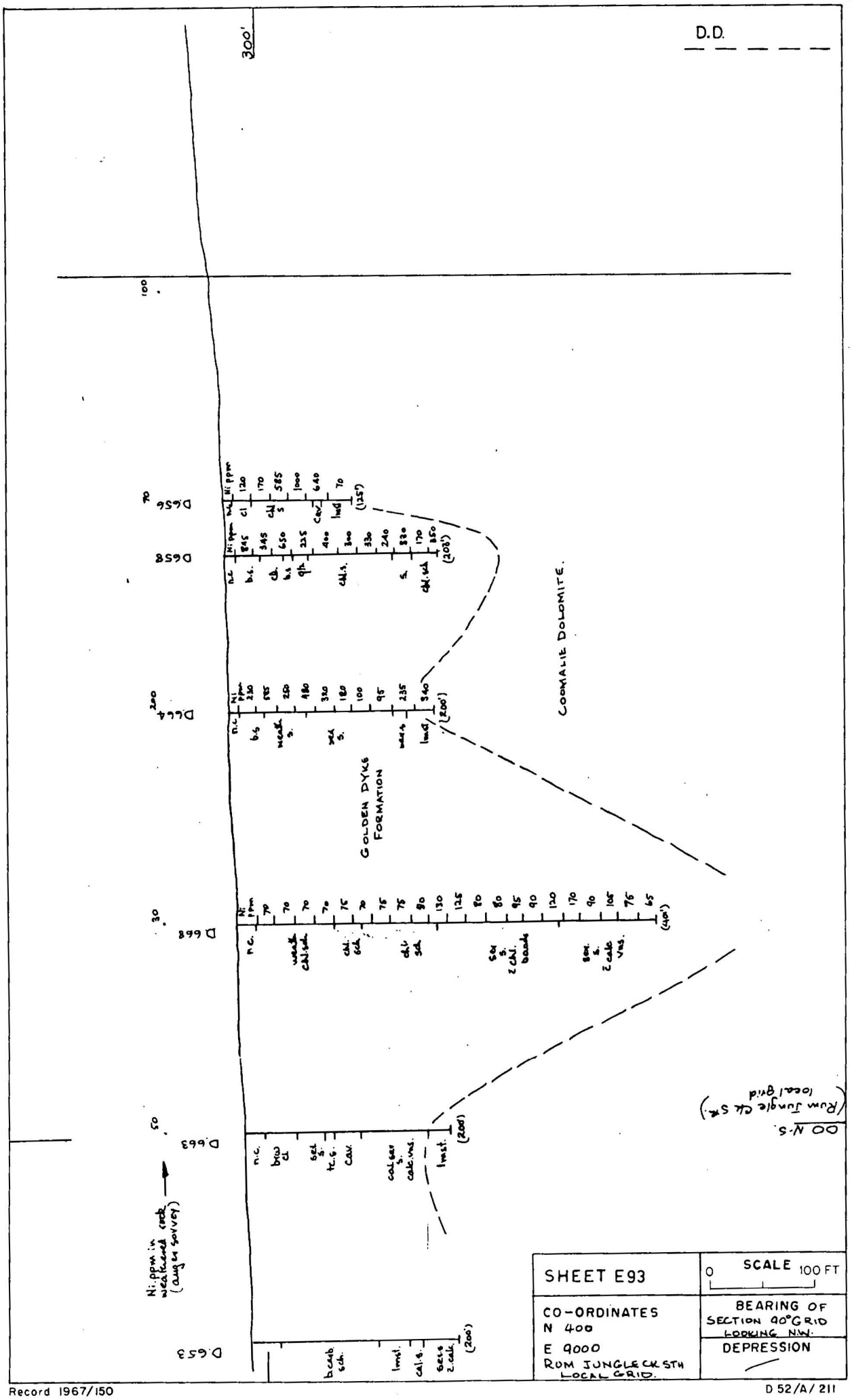
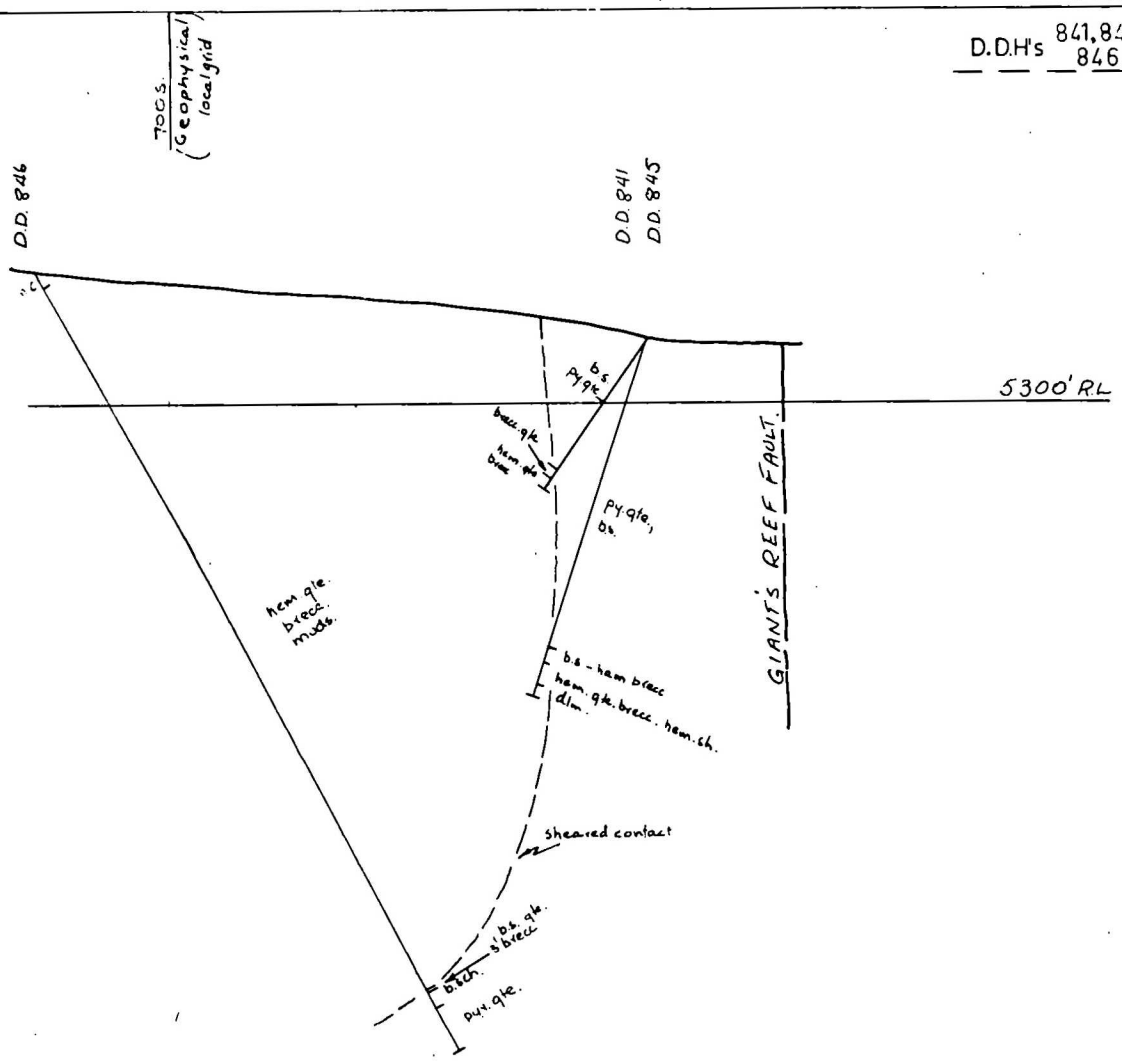

D.D.
300'
100
70
D.656
D.658
200
D.664
30
D.668
03
D.663
D.653
COOMALIE DOLOMITE.
GOLDEN DYKE FORMATION
Ni. ppm in weathered rock (auger survey)
00 N·S. (Rum Jungle Grid S.)
local grid
SHEET E93
SCALE 100 FT
CO-ORDINATES
N 400
E 9000
RUM JUNGLE CR. STH LOCAL GRID.
BEARING OF SECTION 90° GRID LOOKING NNW.
DEPRESSION

PLATE 19.

D.D.H's 841, 845, 846.



SECTION 14

SHEET E63	SCALE 0 — 100FT
CO-ORDINATES N 30040·61 E 33788·57 MINE GRID.	BEARING OF SECTION 120° T LOOKING N.E.
	DEPRESSION

Record 1967/150

D52/A8/366

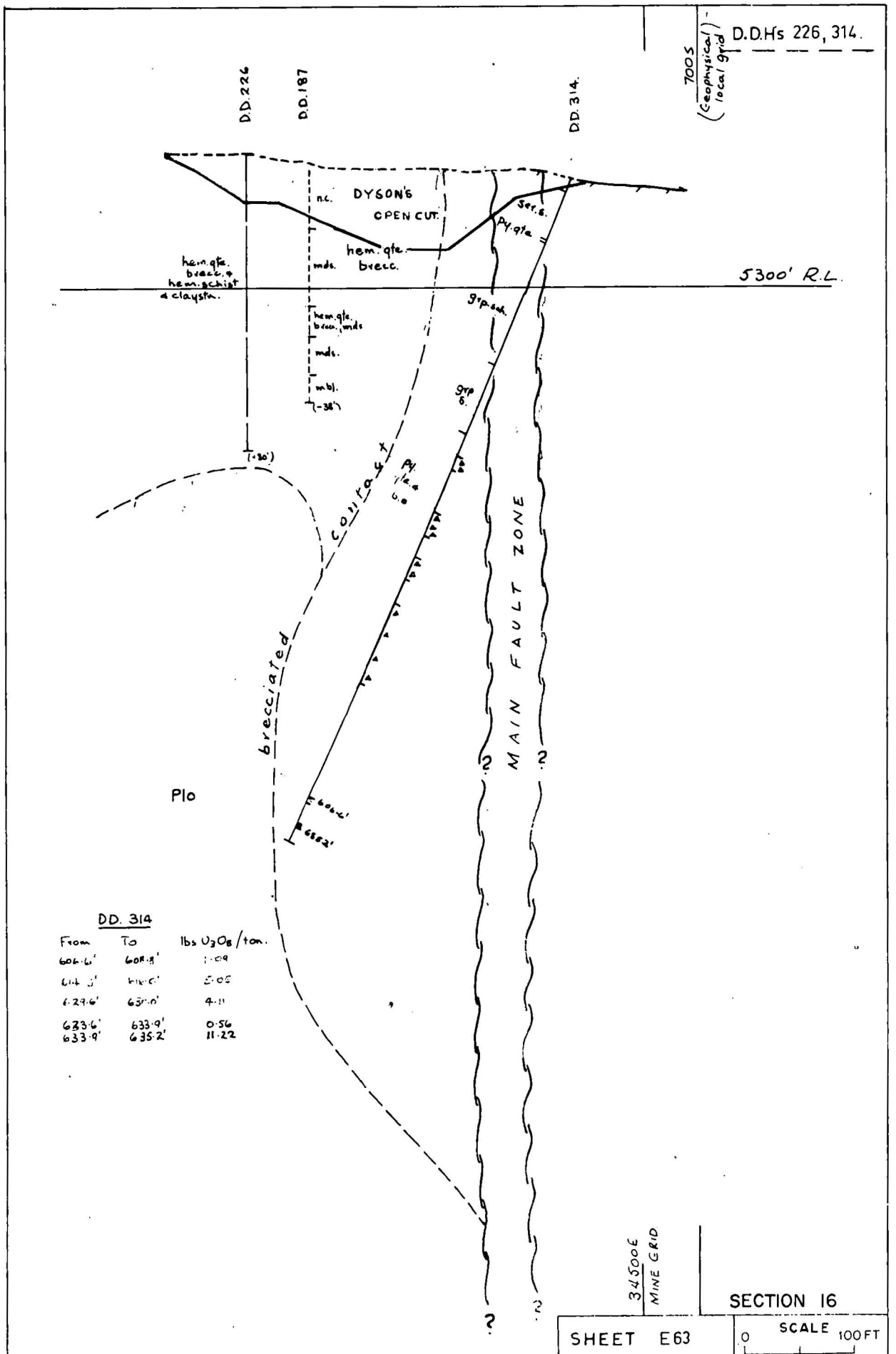
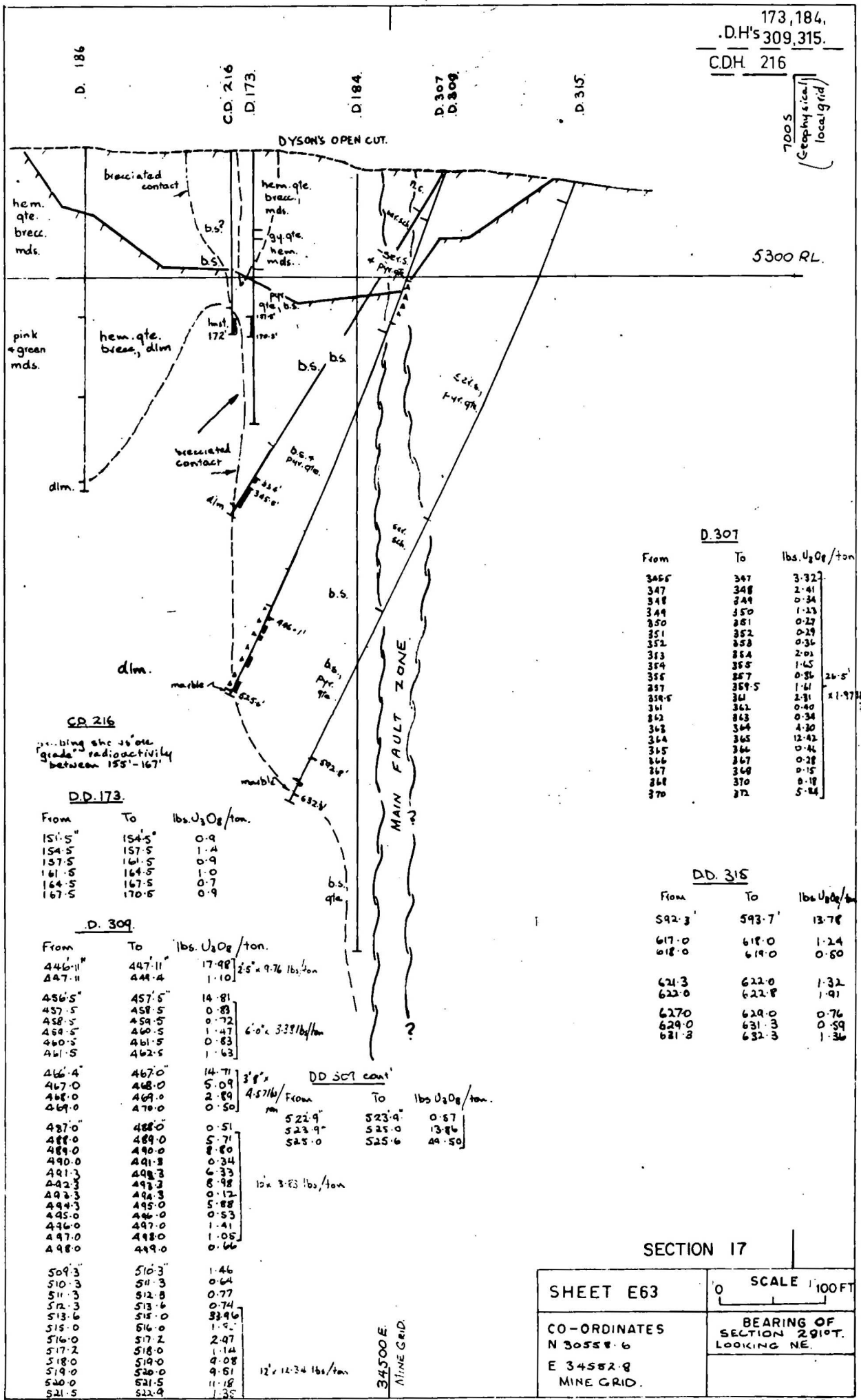

D.D.H's 226, 314.
7005 (Geophysical) local grid
D.D.226
D.D.187
D.D.314
DYSON'S OPEN CUT
n.c.
hem.qte. breccia
Ser.s.
Py.qte
hem.qte. breccia & hem.schist & claystn.
mds.
5300' R.L.
hem.qte. breccia, mds
mds.
mbl.
(-38')
(-30')
grp.sch.
grp
Py
Contact
brecciated
MAIN FAULT ZONE
Plo
?
DD. 314
From To lbs U3O8/ton.
604·6' 608·8' 1·09
614·3' 616·6' 5·05
629·6' 631·0' 4·11
633·6' 633·9' 0·56
633·9' 635·2' 11·22
34500E MINE GRID
SECTION 16
SHEET E63
SCALE 0 100FT
CO-ORDINATES
N. 30334·06
E 3443·59
MINE GRID
BEARING OF SECTION 289°T
LOOKING N.E.

PLATE.22.



CD 216

...bing the above "grade" radioactivity between 155'-167'

D.D. 173.

From	To	lbs. U_3O_8/ton.
151·5"	154·5"	0·9
154·5	157·5	1·4
157·5	161·5	0·9
161·5	164·5	1·0
164·5	167·5	0·7
167·5	170·5	0·9

D. 309.

From	To	lbs. U_3O_8/ton.	
446·11"	447·11"	17·98	2'5" × 9·76 lbs/ton
447·11	448·4	1·10	
456·5"	457·5"	14·81	
457·5	458·5	0·83	
458·5	459·5	0·72	
459·5	460·5	1·47	6'0" × 3.39 lbs/ton
460·5	461·5	0·83	
461·5	462·5	1·63	
466·4"	467·0"	14·71	3'8" × 4.57 lbs/ton
467·0	468·0	5·09	
468·0	469·0	2·89	
469·0	470·0	0·50	
487·0"	488·0"	0·51	
488·0	489·0	5·71	
489·0	490·0	8·80	
490·0	491·3	0·34	
491·3	492·3	6·33	
492·3	493·3	8·98	10' × 3·83 lbs/ton
493·3	494·3	0·12	
494·3	495·0	5·88	
495·0	496·0	0·53	
496·0	497·0	1·41	
497·0	498·0	1·05	
498·0	499·0	0·66	
509·3"	510·3"	1·46	
510·3	511·3	0·64	
511·3	512·8	0·77	
512·3	513·6	0·74	
513·6	515·0	33·96	
515·0	516·0	1·9·	
516·0	517·2	2·97	
517·2	518·0	1·14	
518·0	519·0	4·08	
519·0	520·0	9·61	
520·0	521·5	11·18	12' × 12·34 lbs/ton
521·5	522·9	1·35	

DD 309 cont'

From	To	lbs U_3O_8/ton.
522·9"	523·9"	0·87
523·9"	525·0	13·86
525·0	525·6	49·50

D.307

From	To	lbs. U_3O_8/ton	
346·5	347	3·32	26·5' × 1·977 lbs U_3O_8/ton·ft
347	348	2·41	
348	349	0·34	
349	350	1·23	
350	351	0·27	
351	352	0·29	
352	353	0·36	
353	354	2·01	
354	355	1·65	
356	357	0·36	
357	359·5	1·61	
359·5	361	2·31	
361	362	0·40	
362	363	0·34	
363	364	4·30	
364	365	12·42	
365	366	0·44	
366	367	0·28	
367	368	0·15	
368	370	0·18	
370	372	5·84	

DD. 315

From	To	lbs U_3O_8/ton
592·3'	593·7'	13·78
617·0	618·0	1·24
618·0	619·0	0·60
621·3	622·0	1·32
622·0	622·8	1·91
627·0	629·0	0·76
629·0	631·3	0·59
631·3	632·3	1·36

SECTION 17

SHEET E63	SCALE 1" = 100 FT (0)
CO-ORDINATES N 30558·6 E 34552·8 MINE GRID.	BEARING OF SECTION 291°T. LOOKING NE.

Record 1967/150

D52/A8/369