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Preliminary Report on the Compilation and Assessment of Geophysical Data, Hundred of Goyder, NT

by

W.J. Langron

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SUMMARY

This report is a preliminary assessment of the geophysical work carried out within the Hundred of Goyder up to the end of 1967. As such it is not concerned with proposing new environments or theories for the occurrence of uranium or base metal mineralisation but with completing as thoroughly as possible the examination of environments studied to date.

The presentation is not exhaustive. The prime objective is to formulate the programme required to complete such an examination so that this follow-up work together with any new work required can be incorporated in the 1968 programme of field work in the Rum Jungle area. A detailed report will be prepared at the conclusion of this programme of follow-up work.

What are considered to be the significant geophysical results for each sheet area are shown on the geological base map for that area. The results are discussed for each sheet and recommendations for follow-up work are summarised.

1. INTRODUCTION

Geophysical exploration in the Rum Jungle area (and in particular in the Hundred of Goyder) has been carried out by the Bureau of Mineral Resources (BMR) since 1949. This report is not a detailed summary of all this work, but simply a preliminary assessment of the results within the Hundred of Goyder. As such its main purpose is the drawing up of a programme of geophysical work for 1968 to investigate and, if possible, clarify problems resulting from the work to date. The primary purpose of this follow-up work will be to recommend drilling targets to assist in the search for uranium and other mineralisation and to provide the framework within which the detailed account of the geophysical results will be written.

Thus this report is concerned with interpretation only so far as it is strictly pertinent to the above aims. References to work (usually in the form of BMR Records) are given so that points of detail may be referred to. The area is discussed under one-inch-to-400 feet sub-divisions of the Hundred of Goyder, as shown in Plate 1.

The method of compilation and assessment was as follows:

The results of each geophysical method were plotted on separate sheets for each area, which meant combining work of varying quality and survey accuracy and work done with different instrumentation. Intergrating data at the junction of grids was especially troublesome as, for example, overlapping electromagnetic surveys where both the inductive (loop) and conductive (earthed primary cable) methods are involved (in any instance the direction of the primary cable has an influence on the trend of the contours). Other uncertainties enter because of seasonal effects as, for example, with S-P and radiometric methods. Reconciling data in such situations has been based on the judgement of the author but zones in which anything of significance is suspected are noted for further examination during the joint geological-geophysical assessment of the compilation.

What are considered to be the significant results of each method have been brought together on to the geological base map for each area. The sets of results for each area are shown in Plate 2 to 19.

Results in this form have been assessed in consultation with geologists responsible for the compilation of the geological data. Reference should be made to the preliminary report on the compilation of geological, geochemical, and radiometric data by Miezitis (1967). It is this assessment which is discussed in the following section and which forms the basis for recommendations made for work in 1968.

For the purpose of this report a knowledge of the geology of the area is assumed and this topic will not be discussed specifically here.

2. DISCUSSION OF RESULTS

The results of the assessment are discussed under the separate areas and recommendations for any further geophysical work and for testing are included with each area. The recommendations are summarised in Section 3.

Reports of surveys of a more general nature which include portions or all of the Hundred of Goyder will not be discussed under each area. Such reports include:

1. Wood and McCarthy (1952) - the preliminary report on airborne surveys over the Rum Jungle area using DC3 aircraft.
2. Livingstone (1959) - radiometric survey of the Rum Jungle Region using light aircraft.
3. Bamber (1958) - the ground investigation of aero-radiometric anomalies obtained by DC3 high-level survey.
4. Dyson and Daly (1964) - a brief account of the geophysical operations of BMR at Rum Jungle in the period 1949-53 from the purely physical aspect. The results of some surface radioactive measurements, testing of workings, radiometric assaying, and bore logging are given.
5. Daly (1957b) - the results of aeromagnetic surveys in the Northern Territory using DC3 aircraft. Some large magnetic anomalies were located and there appears to be some correlation between these lines of anomalies and the geology in the Rum Jungle area. It is interesting to note that in at least two cases these magnetic anomalies are associated with surface radioactive anomalies.
6. Browne-Cooper (in preparation) - results of a detailed aeromagnetic survey of an area approximating to the Hundred of Goyder. The broad pattern of magnetic anomalies correlates fairly well with the known geology. The Mount Fitch Fault is clearly delineated but the Giants Reef Fault is less evident in the magnetic contours. Many of the more intense anomalies are ascribed to known occurrences of amphibolite but there appears to be little correlation between the magnetic results over the Rum Jungle Complex and the major rock units into which the Complex has been subdivided (Rhodes, 1965). Trends in the magnetic pattern should assist in the geological interpretation in parts of the region.

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Sheets E31 and E32 (Plates 2 and 3)

References. Ashley (1965), Douglas (1962c)

Discussion. Portions of each sheet were surveyed with the radiometric and Slingram methods.

Radioactivity exceeds 0.03 mr/hr only between traverses 36N and 48N (Mount Fitch North local grid) and is located mainly in the Golden Dyke Formation and close to the Golden Dyke Formation/Coomalie Dolomite boundary. The area of maximum intensity coincides approximately with the crest of a low ridge that crosses the area.

Other radioactivity was located by drilling but trace uranium mineralisation was encountered in only one of the holes.

Two principal Slingram anomaly axes were located; these have been designated A and B and each continues on to sheets further to the south.

Anomaly A occurs at the junction of Beestons Formation and Coomalie Dolomite and on sheet E32 represents a moderate conductor; it is between -2% and -35% in the imaginary component and between 100% and 85% in the real component. Drilling of the junction further south (holes DG22 and DG27 in Sheet E41) suggests that the electromagnetic anomaly may be due to a shear that contains concentrations of copper minerals. For this reason it is felt that the anomaly axis should be traced northwards to the northern boundary of the Hundred of Goyder and that the more promising portions of it be tested by drilling.

Anomaly B is weak and occurs only in the imaginary component. It is associated with the junction of the Golden Dyke Formation and the Coomalie Dolomite and is probably due to the change in lithology rather than to mineralisation. It is of interest to note that all the principal geochemical anomalies lie well to the west of axis B.

Recommendations. The area shown on Sheet E32 should be pegged with traverses 1200 feet long and 400 feet apart. These traverses are to be read with Slingram, self-potential, and radiometric methods with the prime objective of investigating the northward extension of anomaly A. The anomaly axis should also be investigated by the induced palarisation (IP) method before drilling targets are selected. IP along traverse 490N should be included.

No further follow-up work on anomaly B is recommended (but see comments under Sheet E42).

Sheets E41 and E42 (Plates 4 and 5)

References Ashley (1965), Dyson and Daly (1964), Eadie (1964), Langron (1956).

Discussion. Portions of each sheet were surveyed with the radiometric and Slingram methods. On Sheet E41 some traverses were also read with Turam and one traverse was read with IP.

Several zones of moderate to high radioactivity were located on sheet E.41. However, there is some doubt regarding the value of the surface radiometric contours shown because the survey was made at a time of the year favourable to the accumulation of radioactive material in the surface layers. Another doubt exists because of difficulties in reconciling the calibration of instruments used in early work and those used in later work.

Of the two northernmost anomalies on Sheet E41, that centred about traverse 464N is the only one to persist at depth. The higher radioactivity around the Mount Fitch Prospect and workings has been thoroughly investigated by T.E.P. The anomalies in the vicinity of the Finniss River (south-east corner of the sheet) are most likely due to radioactive waste material from the Rum Jungle uranium treatment plant but as the radiometric 'highs' occur close to a supposed lithological boundary it would be wise to check this supposition by auger drilling.

On Sheet E42 the strongest radioactivity extends eastwards from the Mount Fitch workings. The anomaly on 42000 N (mine grid) persists with depth and is associated with a weak Slingram anomaly.

Slingram anomaly A continues through both sheets. Generally it is weak but is supported by a Turam axis on Sheet E41. Anomalies from both methods, however, are expressed mainly in the imaginary component, which suggests a poor conductor. There are local portions where the conductivity increases (e.g. 432N to 438N and 454N to 458N). The generally narrow width of the anomaly suggests that the conductor is near the surface.

In the vicinity of the Mount Fitch Propsect several holes were drilled to investigate the junction of the Crater Formation and the Coomalie Dolomite. Most of these holes intersected bands of pyrite, sulphide , and malachite and it was mainly on the basis of this information that testing of anomaly A north of traverse 470N was recommended (see Sheets E31 and E32).

Slingram anomaly B continues to be associated with the Golden Dyke Formation/Coomalie Dolomite boundary and is present only in the imaginary component. The location of the anomaly axis is uncertain in the region of the Mount Fitch Prospect.

To the south of the prospect, anomaly E would appear to be associated with the same boundary and may therefore be identical with anomaly axis B. However, proceeding southwards, axis E gradually veers further and further away from the boundary and as will be shown varies greatly in conductivity throughout its length. North of 414N it follows to some extent the boundary of the chlorite schist and the carbonaceous schist and chert.

The association of a weak Turam anomaly with Slingram anomaly A has been noted. Other minor Turam axes are present but do not warrant further examination.

The IP survey along traverse 432N did not produce any significant results.

Recommendations. The 0.03-mr/hr and 0.04-mr/hr contour lines to the west and east of the Mount Fitch Prospect should be closed off if this has not been done already.

A line of auger holes should be drilled along traverse 410N to investigate the radiometric 'high' there.

Sheets E51 and E61 (Plates 6 and 7)

References. Ashley (1965), Ashley (1966)

Discussion. A narrow strip along the eastern margins of these sheets was covered with radiometric and Slingram methods.

The highest radioactivity was encountered in the north-east of Sheet E51 in the channel of the Finniss River. The only other 'high' exceeding 0.03 mr/hr lies in the south-east corner of Sheet E61.

During one survey a radiometric anomaly of 0.055 mr/hr was outlined about 27800N/10800E (mine grid) but no anomalous radioactivity could be detected in subsequent check surveys in this region. This would seem to demonstrate the seasonal effect involved when assessing results from this method.

No promising conductors were indicated by the Slingram method.

Recommendation. Follow-up work is recommended in the south-east corner of Sheet E61 (see discussion on Sheet E62).

Sheet E52 (Plate 8)

References. Ashley (1965), Ashley (1966), Langron (1956).

Discussion. Approximately the western half of this sheet was surveyed with radiometric and Slingram methods. Three traverses were read with a magnetometer.

The most intense radiometric anomalies are located in the N-W portion of the sheet close to the channel of the East Finniss River. The anomalies have been tested by drilling and have been established as due to radioactive waste washed down from the treatment plant at Rum Jungle.

The only other significant radiometric anomaly adjoins the Mount Burton open cut and has been thoroughly investigated by T.E.P.

Several Slingram anomalies are present; most axes are not continuous and represent conductivities varying from very good to poor.

Anomaly A continues as a weak intermittent axis associated with the Coomalie Dolomite/Crater Formation boundary.

Anomaly A' may be connected with anomaly A; it is very weak and is present only in the imaginary component.

Anomaly E extends through the sheet exhibiting high conductivity in its northern and southern portions. Good conductors are centred at 393N/124E, 380N/125E, and 369N/127E. The high conductivity is probably due to mineralisation.

Anomaly F is similar to anomaly E but the conductivity maxima are not so high.

Diamond-drill holes 64-2 and 64-3 are collared close to axes F and E respectively. Hole 64-2 intersected mainly black shales and amphibolite (characterised by very low uniform radioactivity); electrical resistance is generally low to about 210 feet; thereafter it increases. Hole 64-3 passed through carbonaceous shales, chloritic schists, and greywake. Pyrite (up to 15%) occurs throughout, with some pyrrhotite in lesser amounts; the electrical log shows that resistance is generally low.

Interpretation in the light of Slingram depth-probing model and field experiments (Duckworth, in prep.) indicates that the anomaly axes are due to narrow conductors as found in the diamond-drill holes.

Anomaly H varies from weak to moderately strong and is displaced at 37075N/1400E (mine grid) by a fault trending north-east. A good conductor is centred at 38275N/13600E. Along traverse 37075N the anomaly coincides with a sharp magnetic anomaly and is probably due mainly to pyrrhotite in that vicinity.

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Diamond-drill holes 64-1 and 64-4 are collared close to axis H. Hole 64-1 encountered only amphibolite containing pyrite (about 10%). The electric log shows generally low resistance; radioactivity is low throughout the hole. Evidently the pyritic amphibolite produces the electromagnetic anomaly. It is estimated that the amphibolite has a horizontal width of about 450 feet.

Hole 64-4 has similar characteristics to 64-1. Pyrrhotite exceeds pyrite in quantity and together these minerals make up about 10% of the rock. The association of the electromagnetic and magnetic axes suggest the presence of two conductors each about 100 feet wide. Both conductors are probably due to zones of high pyrrhotite and pyrite content within the amphibolite.

Anomaly I is a weak anomaly associated with the junction of the Coomalie Dolomite and the Golden Dyke Formation. It probably corresponds to Anomaly B (Sheet E42).

Anomaly K represents a rather poor conductor north of the Finniss River and a moderate conductor south of the river.

Anomaly L represents a poor-to-moderate conductor.

Anomaly M is a real-component anomaly, small in extent, with no imaginary-component anomaly. It is due to a very good conductor. Low-grade uranium mineralisation is reported from hole D350.

Anomaly N is a rather weak anomaly which may be a continuation of axis H. Hole C310 detected low-grade uranium mineralisation.

The magnetic anomalies are almost certainly due to amphibolite that contain pyrrhotite and possibly magnetite. The electromagnetic anomalies coinciding with magnetic anomalies due to shallow bodies are likely to be due to pyrrhotite.

It is striking that there is almost no correlation between the geochemical and geophysical results on this sheet.

Recommendations. IP surveys are recommended along two traverses selected as close as possible to existing drilling information. The purpose of this work is to further examine the conductors, in particular to examine whether the existing drilling has in fact established the source of the electromagnetic anomalies and also to test the interpretation based on model test work. The traverses concerned are:

(a) Traverse 384N (or 38275N, mine grid) between 120E and 140E.

(b) Traverse 372N (or 37075N, mine grid) between 122E and 148E.

The above traverses should also be read with S-P.

Anomaly M should be tested by drilling if this has not been done already.

Sheet E62 (Plate 9)

References. Ashley (1965), Ashley (1966), Daly (1953), Daly, Horvath, and Tate (1962), Douglas (1962d, 1962f, 1963a, 1963b), Eadie (1964), Rowston (1962c).

Discussions. Radiometric, magnetic, and Turam methods were used over most of this sheet. IP measurements were made over two traverses (4N and 20N, Dolerite Ridge grid).

Several radiometric closures of greater than 0.03 mr/hr were mapped and although none of the 'highs' has been tested specifically all have drill holes close by. It is considered significant that of all the holes drilled within the sheet only one (D741) has recorded uranium mineralisation in excess of 0.5lb U_3O_8/ton.

Several Slingram anomalies are present. They are generally weak and discontinuous and many continue southwards from Sheet E52.

There are three drill holes close to anomaly E. D610 passed through amphibolite, chloritic slate, and carbonaceous slate; there was scattered pyrite throughout and traces of pyrrhotite and galena in the amphibolite. D613 passed through interbedded carbonaceous and chloritic slates containing scattered pyrite. Drill hole 64-6 passed through black slate and schist, dolerite and alternating bands of black slate, and calcilutite; there was pyrite (up to 10%) after 200 feet and pyrrhotite in parts exceeding 5%. The dolerite exhibits very low radioactivity. In the black slate and calcilutite, radioactivity in places is about twice the mean level of radioactivity recorded from similar rocks in other holes.

As with Sheet E52, anomaly E (and F) is interpreted as due to a series of narrow conductors.

Anomalies marked 'E' are small in extent and represent moderate conductors. They are probably close to the boundary of the sericite schist and the carbonaceous schist and chert.

Anomaly F continues on to the sheet for only a short distance. Holes D600 and D601 were drilled vertically to a depyh of 300 feet and were in pyritic black slate over the entire distance. The pyrite content was estimated at between 2% and 5% by volume.

Anomaly P is an extensive anomaly of variable intensity and represents a poor to moderate conductor. It would appear to be associated with a lithological boundary and in its southern portions is associated with intermittent poor to moderate Turam anomalies.

Anomaly Q represents a moderate conductor with characteristics similar to P.

Anomalies R, S, T, and U are similar in strength to each other and represent moderate conductors. Mostly they are over dolerite and it is likely they represent bands of shale within the dolerite. Anomalies T and U represent fair to moderate and poor to fair conductors respectively and are in dolerite and black slate. The log of drill hole 64-7 is similar to those for holes discussed already for this sheet, but it is of interest to note that the average pyrite content of the black slate is only about 5%, which is insufficient to explain the intensity of the anomaly at this location. The black slate here is apparently not much more graphitic than in the other drill holes.

Anomalies V and W are parallel to the junction of the Coomalie Dolomite and Golden Dyke Formation and are most likely due to near-surface changes in conductivity.

Anomaly X is a weak anomaly associated in its northern portion with a weak Turam anomaly; this indicates that the conductivity increases slightly with depth in this area.

Anomaly Y is also a weak anomaly associated with a Turam anomaly of contrary strike. The Turam anomaly is probably of deeper and different origin. D619, collared near the axis of the anomaly, encountered mostly chloritic schist with minor pyrite.

Anomaly Z represents a very good conductor and is associated with a strong Turam anomaly. The Turam anomaly is offset along traverse 14N, indicating faulting at depth. Diamond-drill holes D598 and D599 were sited to determine the source of the electromagnetic anomalies. In each hole from about 150 to 170 feet, highly pyritic - pyrrhotitic (40% by volume) calcareous amphibolite was found. The Turam axis lies on the eastern flank of a magnetic anomaly and it is probable that the main pyrite-pyrrhotitic body is west of the E.M. axis.

Where Turam anomalies exist they are generally to the west of the Slingram axes confirming that the conductors have steep westerly dips.

In the south-east portion of the area the strike of anomaly axes is west to south-west. The actual transition in geological strike takes place over a fairly wide zone and would appear to extend well to the north of the shear zone shown in the south-east corner of the sheet.

The intensity of Slingram anomaly 1 varies markedly along its length. On this sheet it is weak and is accompanied by a Turam axis which is also weak. Both axes coincide with the shear zone. Discussion of this anomaly will be deferred until Sheet E72.

Anomaly 4 represents a body of fair to moderate conductivity of length about 1000 feet. It has not been surveyed by the Turam method.

Of the several magnetic axes present on the sheet those in the western portion are a continuation of magnetic anomalies already discussed in sheets to the north and are most likely due to amphibolite containing pyrrhotite and/or magnetite.

Although the IP method detected the pyrrohotite bodies, no worthwhile additional information was obtained to assist in interpreting the E.M. results.

Recommendations. The core of drill hole 64-7 (testing Slingram anomaly U) should be examined for base metal content. If necessary another hole should be put down (on 68N) to test the anomaly.

A grid extending from 254N to 218N and from 110E to 150E to be surveyed by Slingram along north-south traverses 400 feet apart. The strike of the beds in this region is approximately westerly and the existing survey has not tested the environment adequately.

A grid with baseline from 160W/10N to 160W/8S (Dolerite Ridge local grid) and traverses 200 feet apart extending to 140W to be surveyed by Slingram and S-P. This work will test the possibile occurrence of conductors whose axes strike north to north-west within the 'transitional zone'. The most intense geochemical anomalies on the sheet occur here.

Slingram anomaly axis 4 should be inspected geologically with a view to testing by drilling.

Sheet E53 (Plate 10)

Reference. Ashley (1966).

Discussion. Widely-spaced north-south traverses near the southern margin of the sheet were read with Slingram and magnetic methods.

The weak electromagnetic axes may be due to increased conductivity at lithological boundaries although nowhere are conductivity changes high.

The peak of the magnetic anomaly (on Traverse 278E) is over the hematite boulder conglomerate of the Crater Formation and the anomaly presumably is due to magnetic portions of the conglomerate.

Some surface radiometric readings were taken during the course of the geochemical work but nothing of interest was found.

Recommendation. No follow-up work is recommended.

Sheet E63 (Plate 11)

References. Allen (1951), Ashley (1966), Daly (1953, 1957a), Daly, Horvath, and Tate (1962), Douglas (1963a, 1963b), Eadie (1964), Langron (1956).

Discussion. Radiometric, magnetic, electromagnetic (Slingram and Turam), self-potential, and gravity methods were used over much of the sheet, the work being concentrated in and around the western portion of the 'Embayment Area'. IP measurements were made on traverses 73W, 78W, 84W, and 99.1W.

The original radiometric work led to the mining of uranium ore at Whites and Dysons open cuts. Since then all promising geological environments have been covered with this method and all significant anomalies have been, or are being, tested. This includes the proposed investigations of occurrences of Crater Formation within the sheet.

The orebody at Browns prospect lies north of the magnetic anomaly and has a strike roughly parallel to it. It is apparent that the anomaly is associated with the rocks described as 'amphibolite'.

The initial Slingram work over Browns prospect and part of the Intermediate area was favourable and led to a more extensive coverage using the Turam method. Several anomalies were located (labelled A-E and G), the main feature of which is that going west there is a fairly consistent increase in width and a decrease in intensity.

Anomalies A and C are located over the orebody that has been explored by drilling. Anomaly B is strong but does not persist very far in depth, and drilling suggests that the anomaly is caused by a pyritic zone that does not contain mineralisation of economic value. Anomaly D is short and moderately strong; drill holes 56B13 and 57B42 intersected sulphides (predominantly galena), pyrite, and graphitic schist. Anomaly G may be due to a conducting zone which extends through to Sheet E62 to the west. Drill holes 56B18 and 56B16 intersected pyrite and sphalerite with little lead.

The only reliable self-potential measurements were made after the ground was well saturated by rain and these results agreed very closely with the electromagnetic anomalies discussed earlier. Further tests showed that the self-potential measurements were strongly influenced by climatic conditions (see Daly, 1962a).

IP indications were in good agreement with the E.M. and S-P results.

Gravity measurements were made over the orebody at Browns prospect but no anomaly due to mineralisation was obtained. Two traverses were read over the 'Embayment Area' to help elucidate the structure; the gravity 'high' is thought to represent the maximum depth of sediments in the syncline.

Recommendations. No further geophysical work is recommended specifically in this area as it is felt that all possibilities of mineralisation along the Browns-Dysons line are being followed up at present.

However, testing of Turam anomaly G (preferably by drilling) in its western portion should be carried out.

The area about the S-P anomalies north of the East Finniss River should be examined geologically.

Sheet E73 (Plate 12)

Reference. Ashley (1966).

Discussion. Radiometric and Slingram methods were used in the north-west corner and in the extreme south-west corner of the sheet.

No abnormal radioactivity was located.

A weak Slingram indication, mainly in the imaginary componont, indicates the presence of a narrow conductor continuing from Sheet E63.

Recommendation. No follow up work is recommended.

Sheet E71 (Plate 13)

Reference. Ashley (1966).

Discussion. A strip along the eastern margin of the sheet was surveyed with radiometric, Slingram, and Turam methods.

No significant radiometric anomaly was discovered, readings at one or two locations reaching just below twice background.

Several conductors were located with the Slingram method. Most exhibit poor conductivity but the axis in the northern portion of the grid represents a body of fairly good conductivity. Diamond-drilling (D721 and D722) indicates that this Slingram anomaly is due to carbonaceous slate. Drilling of weaker Slingram anomalies further south indicate that they are due to carbonaceous slate (D817 and D829) and amphibolite (D821 and D828).

Turam work was limited to coverage of a group of geochemical anomalies in the southern portion of the grid. A narrow conductor of only fair conductivity was located and is supported in part by a weak Slingram anomaly.

Recommendations. No follow-up work is recommended.

Sheet E72 (Plate 14)

References. Ashley (1966), Daly, Horvath, and Tate (1962), Douglas (1962c, 1962d, 1963b), Eadie (1964), Maranzana (1963).

Discussion. Radiometric and Slingram methods were used over most of this sheet and Turam and self-potential methods on selected portions. One traverse in Area 55 West was read with IP.

This sheet includes Area 55 and Area 55 West, both of which have been prospected intensively on the basis of radiometric investigations. The highest values of radioactivity are located about and to the south of Area 55. The most intense pattern of geochemical anomalies is also located here. A less intense pattern of radioactivity occurs about Area 55 West.

There are two principal Slingram anomaly axes the strongest of which, labelled axis 1, lies to the west of Area 55 prospect and continues north-eastwards into SheetE62 and Browns area. The intensity of the anomaly varies considerably along its length; it attains a maximum amplitude near Rum Jungle Creek. At Browns and Area 55 the anomaly is much weaker.

South of 18S (Area 55 local grid) anomaly 1 follows the dolomite/shale contact; i.e. it is on the extension of the Browns line of sulphide mineralisation and it is possible that it indicates sulphides with associated uranium mineralisation. However, it is also possible that, in the main, anomaly 1 indicates a shear parallel to the Giants Reef Fault and it could be of the same age. If the latter contention is true then the shear is unlikely to be mineralised as mineralisation pre-dates the Giants Reef Fault. No Turam work has been carried out over the Slingram axis.

The geologists propose three drill holes to test geochemical results in the vicinity of the strongest portion of the Slingram axis. The holes may not test the Slingram results adequately, however.

The other major Slingram anomaly is in the eastern portion of the sheet and strikes parallel to the Giants Reef Fault Zone. The feature represents a narrow, shallow conductor of medium conductivity. Traverses in this region are 400 feet apart.

There are no significant geochemical anomalies associated with this feature. In many ways it is similar to anomaly 1 but because of its proximity to the Giants Reef Fault Zone and the doubts already existing concerning the association of mineralisation with anomaly 1 it is considered better to limit further investigations to anomaly 1 at this stage.

A shorter Slingram axis to the east of anomaly 1 has a Turam anomaly closely associated with it and has been tested by drilling along much of its length. The Turam work only covered the central area of high radioactivity and an area about Area 55 West prospect. The Turam anomaly is of better quality than the Slingram anomaly and represents a body of moderate conductivity with conductivity increasing to the north-east. The short Turam axis encountered on traverse 32S at 2W suggests the commencement of a body of good conductivity though this is not supported by the Slingram results.

Other Turam axes in Area 55 West represent rather poor conductors with little confirmation from the Slingram results. The electromagnetic results confirm the existence of the fault shown in the north-east portion of the Area 55 West grid.

Self-potential measurements were made over the main portion of Area 55. Anomalies exceeding 200 millivolts were obtained over the mineralisation zone. The problem here, as in other portions of the Rum Jungle Field, is to interpret the rather 'loose' association between S-P anomalies and sulphide mineralisation.

Only weak IP indications were obtained but these were in agreement with pyritic mineralisation intersected by drill holes in Area 55 West.

Recommendations. A grid should be surveyed with Turam between 4S and 16N (Area 55 local grid) with traverses 200 feet apart extending from 4W to 15W. This grid will include the north-east extension of the Slingram-Turam anomaly over Area 55 prospect. The grid should also be covered with S-P.

Traverse 00 should also be read with IP. Two traverses (6N and 8N) should be extended as shown and read with IP.

The cores from drill holes D690, D692, D767, D809, and D814 should be assayed for copper although assays from holes D795 and D804 show only trace copper.

The zone about the short Turam axis at 2W on traverse 32S should be examined geologically.

Sheet E81 (Plate 15)

Reference. Ashley (1966).

Discussion. The eastern portion of this sheet was covered with radiometric and Slingram methods.

No promising radiometric anomalies were located. Several Slingram anomaly axes were located and follow a pattern and trend similar to the axes on Sheet E71. Conductors generally show poor conductivity, the best portion being within the westernmost axis (labelled 1).

The western axis lines up quite well with geochemical anomalies. No significant radioactivity was discovered in several drill holes located near the portion of the axis between 11400 N and 12000 N, but uranium values were higher in D834 to the south. Diamond drilling (D834) suggests that the Slingram anomaly is due to carbonaceous slate.

Anomaly 1 may be a continuation (with cross-faulting) of anomaly 1 shown on Sheet E72; it continues fairly strongly on to Sheet E82. There is no extensive geochemical anomaly associated with this axis, which lies close to the Coomalie Dolomite/Crater Formation boundary.

Recommendations. A small grid of nine traverses 200 feet apart to be surveyed with Turam and S-P about anomaly 1. This grid may need to be extended if promising results are obtained. Two traverses (12600 N and 13600 N) to be surveyed with IP.

Sheet E82 (Plate 16)

References. Ashley (1966), Douglas (1962b), Maranzana (1963).

Discussion. Radiometric and Slingram methods were used along traverses 400 feet apart in the western portion of the sheet and along traverses 200 feet apart in the north-west corner of the sheet.

The only radiometric anomaly of significance is located in the north-east corner of the sheet. The anomaly has been tested by drilling; some uranium mineralisation and reasonably high-grade phosphate mineralisation have been intersected.

The main Slingram feature follows the Giants Reef Fault Zone. The other axes occur to the west; anomaly 1 has been discussed already (Sheet E81).

The Slingram results in the north-east corner of the sheet suggest poor conductors; with possibly one exception the anomaly axes are short.

There is little geochemical evidence on this sheet to support the geophysical results.

Recommendation. No follow-up work is recommended on this sheet.

Sheet E83 (Plate 17)

References. Daly (1962b, 1963), Daly and Rowston (1962), Douglas (1962a, 1962b), Eadie (1964), Maranzana (1963), Rowston (1962a).

Discussion. Radiometric, Slimgram, and Turam surveys were carried out over an elongated grid extending through Rum Jungle Creek prospect and Rum Jungle Creek South open cut and over a second grid extending along the western side of the North Australian Railway Line. IP measurements were made over traverse 58E.

Radiometric anomalies of up to $4\frac{1}{2}$ times background were obtained in the vicinity of the Rum Jungle Creek South deposit, the largest of the uranium orebodies mined in the Hundred of Goyder. Smaller anomalies were obtained in pits and costeans near the orebody. BMR did not carry out any systematic radiometric work about the Rum Jungle Creek prospect before its discovery. All radiometric results on this grid have been followed up by T.E.P.

A few small anomalies of up to twice background were located in the eastern grid. The most important anomaly has a peak on traverse 64E but neither this nor the smaller anomalies to the south-east are associated with geochemical anomalies. Auger drilling on the northern portion of the grid suggests that radiometric anomalies there originate in a thin near-surface layer.

Generally, the Turam results are of better quality than the Slingram results. In the western grid electromagnetic anomalies lie in a distinct conducting zone. The more intense anomalies are ascribed to an increase in conductivity due either to sulphide or graphite concentrations or to local shearing. Strong electromagnetic anomalies are located close to the known uranium orebody at Rum Jungle Creek South. Over the Rum Jungle Creek prospect the Turam anomalies are weak but increase in intensity to the south-east. The 'character' of these anomalies is different from most other electromagnetic anomalies in the Rum Jungle district. In conjunction with the radiometric work it is considered that the electromagnetic results have been tested sufficiently on this sheet.

Some magnetic, induced polarisation, and self-potential measurements were carried out but the methods were not successful and their use was discontinued.

On the eastern grid electromagnetic results indicate some bodies of poor conductivity. The best results were obtained in the south-east portion of the grid (south from traverse 100E) where Turam was used. No Turam work was done north of traverse 78E.

No worthwhile IP results were obtained on this sheet.

The electromagnetic axis in the south-east portion of the sheet represents a wide conductor, which extends southwards to Batchelor Laterites, where it turns north and continues to Rum Jungle Creek South. The axis may therefore represent a favourable target for mineralisation. The portion of the electromagnetic axis south of traverse 100E, eastern grid, should be examined further and tested by drilling (see Sheet E93).

<u>Sheet E93</u> (Plate 18)

<u>References</u>. Ashley (1965), Douglas (1962a, 1964). Eadie (1964), Rowston (1962a, 1962b).

<u>Discussion</u>. Radiometric, Slingram, and Turam methods were used over the grids located mainly in the eastern half of the sheet. IP measurements were made over traverse 4N.

The principal radiometric anomalies are located about the Castlemaine Phosphate Prospect and along the central eastern border of the sheet. The Castlemaine Hill grid has been thoroughly tested and there does not appear to be any possibility of economic mineralisation. The eastern group of anomalies is associated with laterite gravel in pits and spread along tracks. Other small radiometric 'highs' are not considered to be significant.

Several Slingram anomalies were located within the sheet. The representation of the electromagnetic results in the Castlemaine Hill grid area must be treated rather cautiously because elevation differences between the coils necessitate corrections being made to the real component values; no such corrections are needed for the imaginary component values upon which interpretation has been based.

Anomalies in the western Slingram axis north of traverse 90E could be significant particularly as the conducting zone is a continuation of that associated with the Rum Jungle Creek South pyritic uranium orebody. In the Castlemaine Hill grid area the anomalous zone is about 400 feet wide and is attributed to a stratigraphic feature with lenticular maxima within it. This anomaly is less clearly defined south of traverse 104E where some of the maxima were probably due to swampy alluvium.

The zone of off-scale readings centered on traverse 128E is probably related to old army installations buried in this region.

The zone of highly anomalous readings in the south-east corner of the sheet contains an anomaly axis labelled B which probably overlies a shear and continues well into Sheet E94. Near the eastern margin of the sheet there is a large area where the imaginary component values are off-scale negative; the reason for this is not clear. Anomaly B cuts across the general trend of the other anomalies and its strike is very similar to that of the Giants Reef Fault. Hence the shear causing anomaly B is unlikely to be mineralised.

Turam results north of 78E and south of 102E in general agree with the Slingram results.

However, one anomaly, anomaly A, was detected by the Turam method only. Anomaly A is a broad elongate ratio anomaly with axis extending from 2S/153E to 14N/154E and is the only anomaly that is similar to that detected adjacent to the Rum Jungle Creek South orebody. The anomaly indicates good conductors at depths of about 200 feet.

The principal geochemical results are located over the western grids on this sheet. Numerous vertical holes have been drilled to test the geophysical (and geochemical) results. No significant mineralisation was reported but there is reason to suspect that the cores were not examined in detail.

The main Slingram anomaly axis in the north-east of the sheet is a continuation of the axis discussed on Sheet E83 and represents a zone of fairly good conductivity between traverses 142 and 100E. These anomalies probably indicate a conducting bed that constitutes part of a continuous conducting zone extending as far as Rum Jungle Creek South and as such could be significant.

The IP work is less detailed on this sheet than elsewhere and the results generally are not promising although there seems to be some relations between the weak IP indications and increased pyrite content.

Recommendation. The Slingram anomaly axis in the north-east corner of the sheet should be covered by Turam and S-P with traverses 400 feet apart and extending from 30N to 42N between 146E and 100E (Power Line local grid). This will improve the selection of drilling targets along the electromagnetic axis. Geochemical sampling should also be carried out over this grid.

Cores from holes testing the best portions of the E.M. axes in the western grids should be scraped and assayed.

Cores from D677, D685, and D691 should be carefully examined and logged geologically. Cores should be scraped and assayed. These three holes should be cleaned out and logged geophysically pending any recommendations for further testing of anomaly A.

Sheet E94 (Plate 19)

Reference. Douglas (1962a, 1964).

Discussion Radiometric, Slingram, and Turam methods were used over grids along the western margin of the sheet.

The radiometric 'highs' are associated with radioactive laterite and laterite gravels and do not warrant further investigation.

The Slingram anomaly axis in the north-west corner of the sheet continues through from Sheet E93; recommendations have been made for coverage by Turam of a section of this axis.

Anomaly B continues through from Sheet E93 and has been discussed already.

Turam anomaly A continues on to this sheet and has been discussed on Sheet E93.

Recommendation. Further Turam work, in the north-west of the sheet, has been included in the recommendations for Sheet E93.

3. SUMMARY OF RECOMMENDATIONS

Sheet No.	Method	Surveying required (Approx. footage)	Remarks
E32	Slingram, S-P, IP, radiometric	20,000	
E41	Radiometric	-	1 line of auger holes recommended. Close off radiometric contours.
E42	Radiometric	-	Close off radiometric contours.
E52	S-P, IP	4600	2 traverses
E62	Slingram, S-P	Grid A:40,000 Grid B:20,000	Grid A also on E61, E71,E72. Examine core of DDH 64-7 for base metal content.
E63	-	-	Testing of a Turam anomaly recommended.
E72	Turam, S-P, IP	14,000	
E81	Turam, S-P, IP	Grid F:12,200	Grid F also on E82.
E93	Turam, S-P	Grid H:14,400	Grid H also on E83, E94. Geochemical sampling also recommended. 3 drill holes to be logged geophysically.

Note: S-P work is to be carried out only when ground conditions are judged to be suitable.

23

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25

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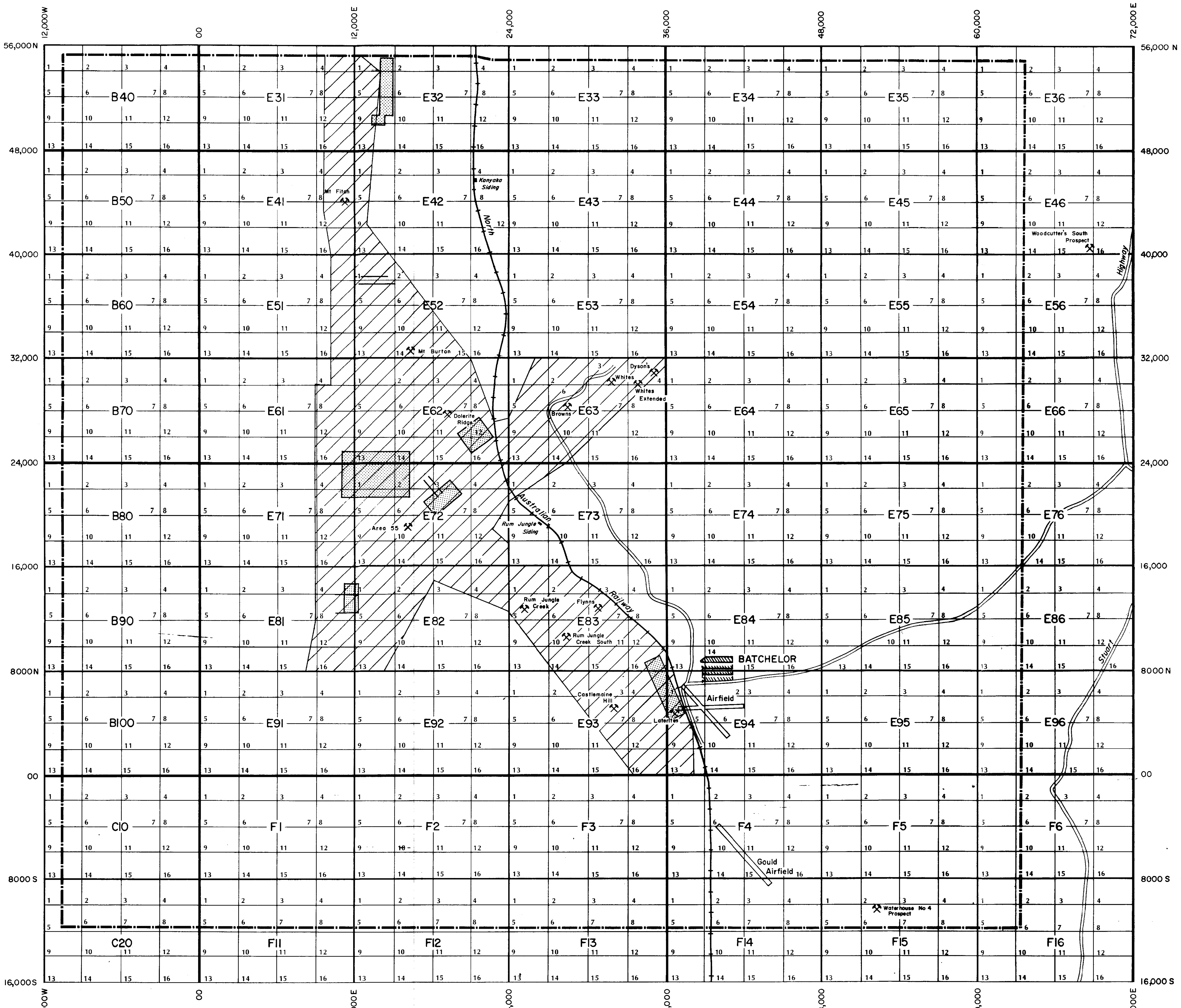
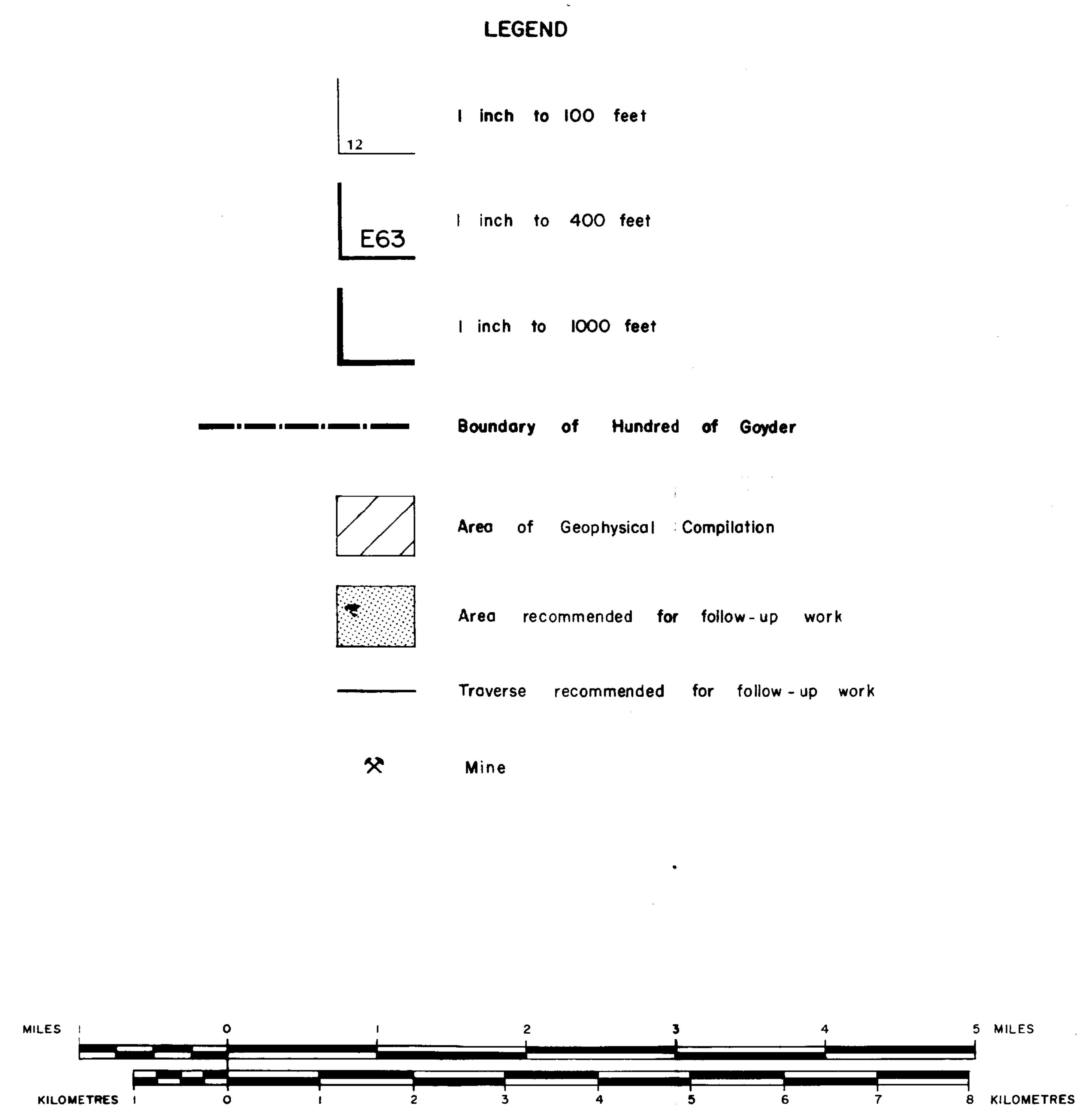




HUNDRED OF GOYDER,
RUM JUNGLE AREA

LOCALITY PLAN

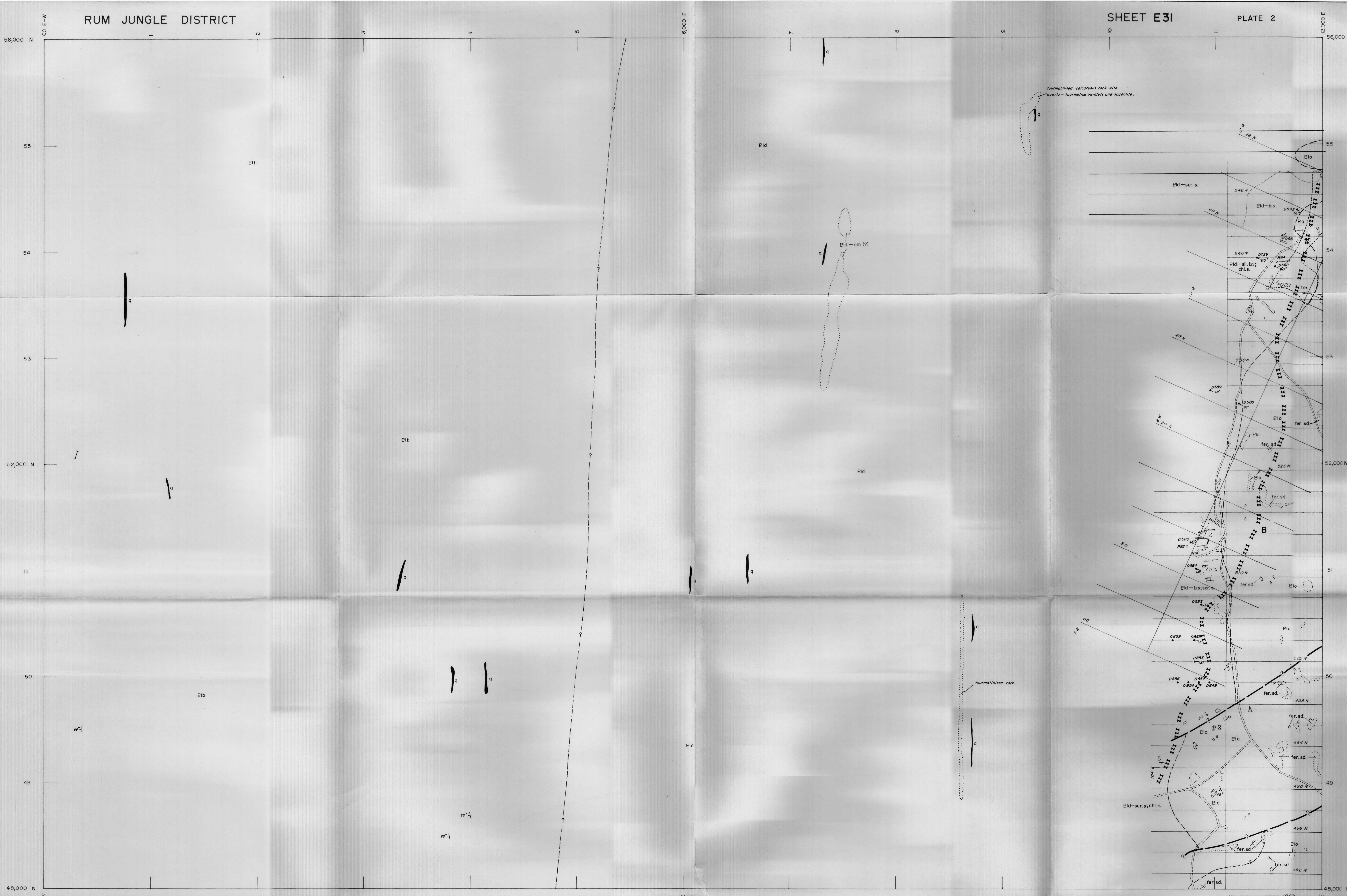
(Based on D52/B0-50)

TO ACCOMPANY RECORD No. 1969/23

D52/B7-447

RUM JUNGLE DISTRICT

SHEET E31 PLATE 2



B30	E21	E22
B40	E31	E32
B50	E41	E42

LOCATION DIAGRAM

REFERENCE

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

?TERTIARY

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

LOWER PROTEROZOIC

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

LOWER PROTEROZOIC

Ꝑld — 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.

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

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: D.O. Shatwell 1966.

Amended by: Y. Miezitis, July 1967.

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

Mapped outcrop and rock exposure

$>0{\cdot}03$ mr/hr

XXX XXX Medium Axis of Slingram Anomaly

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault

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

85° Strike and dip of bedding.

40° Strike and dip of cleavage, schistosity.

Vertical cleavage

D584 60° T.E.P. diamond drill hole showing direction and depression where hole is inclined.

R93 B.M.R. Rotary drill hole

Bulldozed costean

Vehicle track

q Vein quartz

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 No I grid, B.M.R Record No 1965/6.

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

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

(5) Marjoribanks (T.E.P. Ltd) 1966 survey, mapping west of Mt. Fitch No I grid

D52/B7-422

TO ACCOMPANY RECORD No. 1969/23

RUM JUNGLE DISTRICT

SHEET E32 PLATE 3

LOCATION DIAGRAM

E21	E22	E23
E31	E32	E33
E41	E42	E43

REFERENCE

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

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: D.O. Shatwell 1966

Amended by: Y. Miezitis July 1967

? TERTIARY

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

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Pld — bs - 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 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA,

HUNDRED OF GOYDER NT

Mapped outcrop and rock exposure

LEGEND

Strong Axis of Slingram Anomaly

Area recommended for follow-up work

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

Vehicle track

PEGGED GRIDS

A. MT. FITCH NORTH.

B. MT. FITCH I.

C. 1966 TEP Ltd.

Compilation based on:

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

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

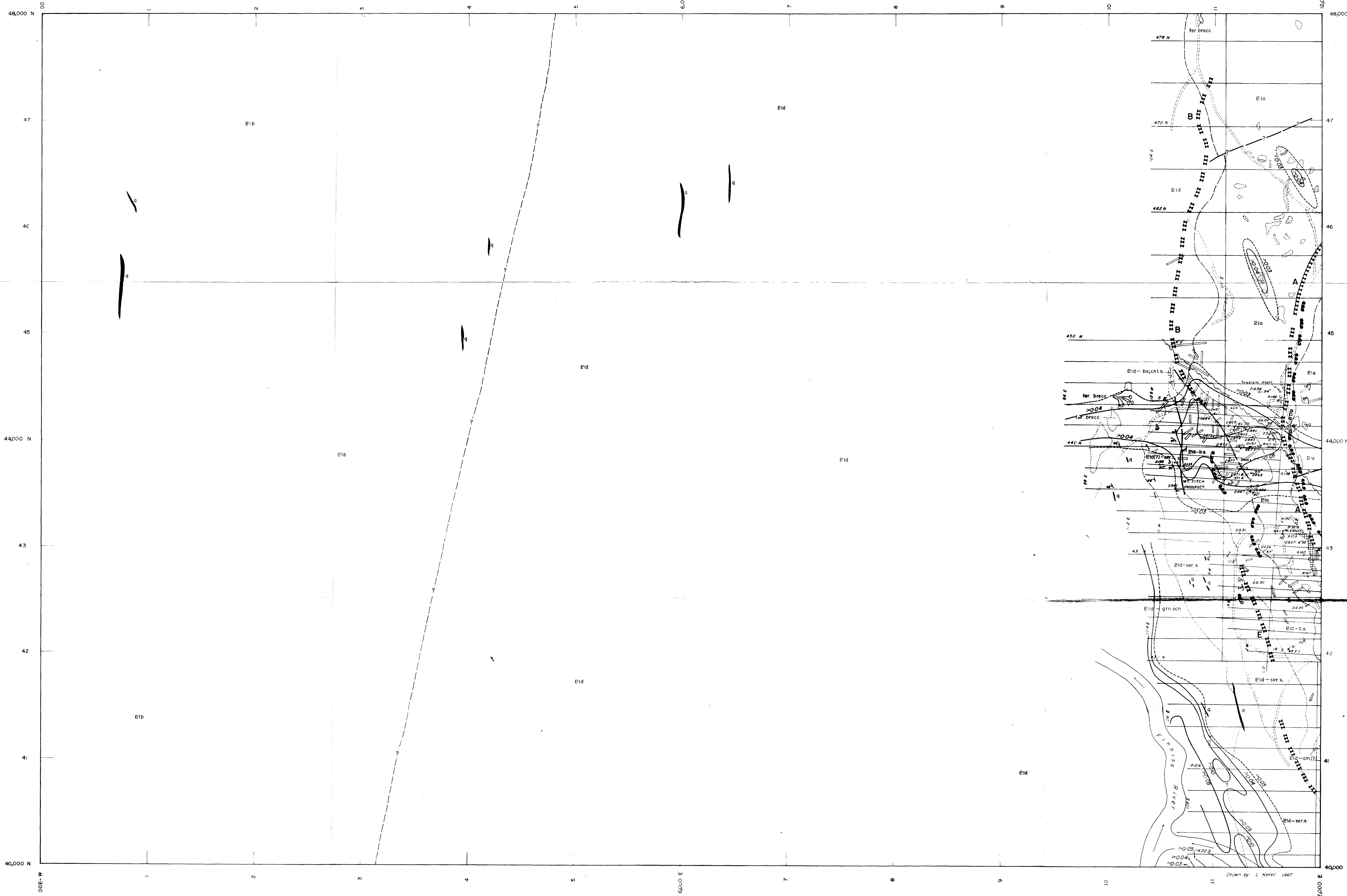
Berkman (T.E.P. Ltd) 1966 survey

D52/B7-423

TO ACCOMPANY RECORD No. 1969/23

RUM JUNGLE DISTRICT

SHEET E41 PLATE 4



B40	E31	E32
B50	E41	E42
B60	E51	E52

LOCATION DIAGRAM

REFERENCE

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

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

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

?TERTIARY

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

LOWER PROTEROZOIC

BURRELL CREEK FORMATION

Ɛlb — *pale brown and purple (quartz, sericite, chlorite) slate and greywacke.*

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Ɛld — *b.s.— black carbonaceous and/or graphitic slate, schist; chl.s.— chloritic slate, schist; ser.s.—sericitic slate, schist; grn. sch.—greenschist; am.—amphibolite.*

COOMALIE DOLOMITE

Ɛlo — *dolomite, chloritic dolomite, talc schist, calcareous shale, tremolitic schist.*

CRATER FORMATION

Ɛlr — *quartz schist, quartz feldspar schist, hematite boulder conglomerate and schist.*

BEESTONS FORMATION

Ɛle — *arkose schist, arkose conglomerate*

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

Mapped outcrop and rock exposure

Gossan

LEGEND

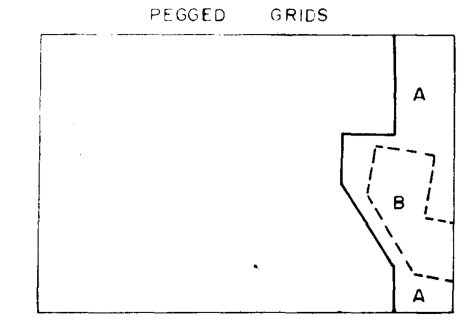
> 0·03 mr/hr
> 0·04 mr/hr
> 0·05 mr/hr
> 0·10 mr/hr
} Radiometric Contours

Strong
Medium
} Axis of Slingram Anomaly

Weak — Axis of Turam Anomaly

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
Vein quartz
Quartz rubble

PEGGED GRIDS



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.

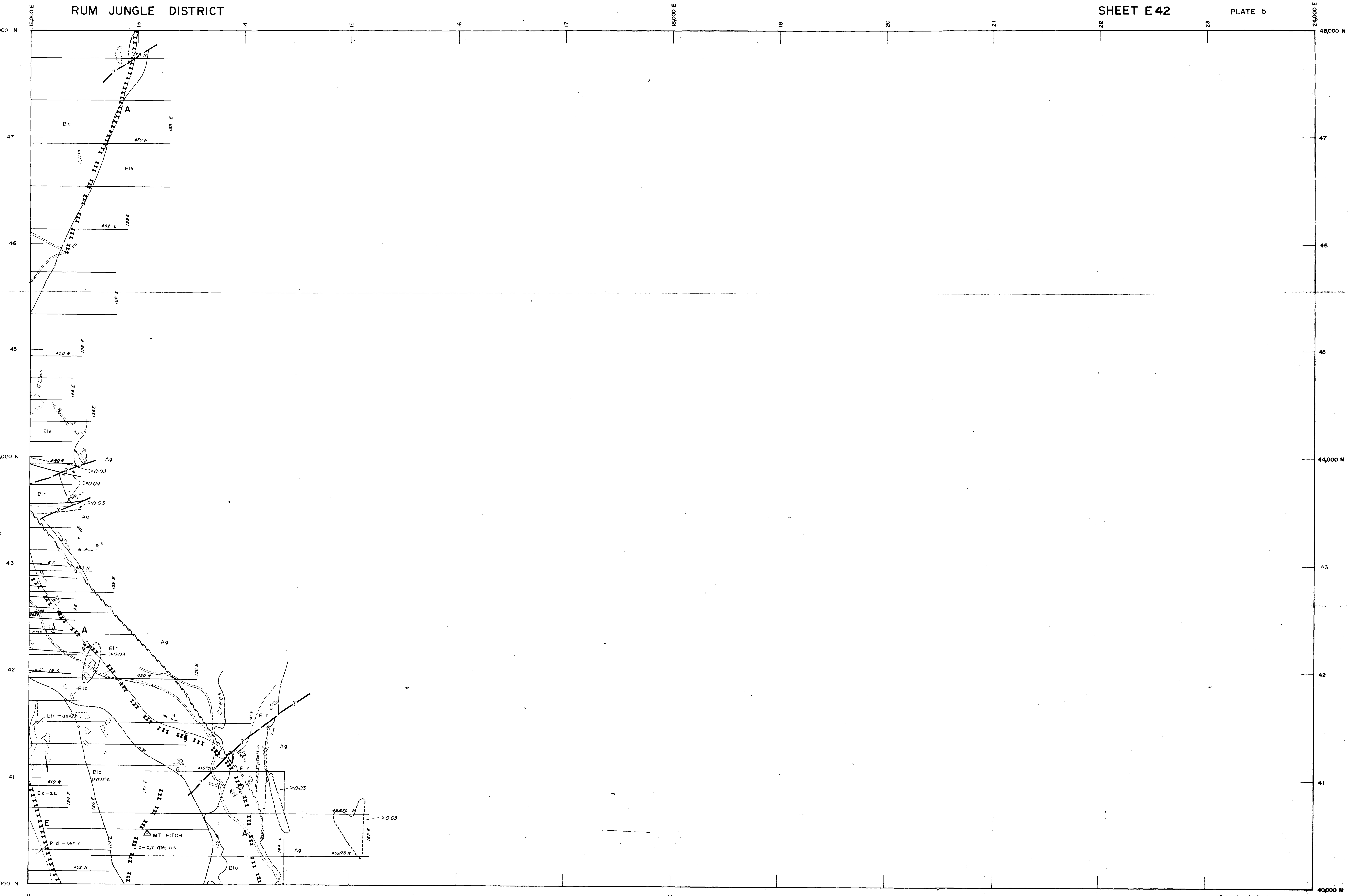
(5) Marjoribanks (T.E.P. Ltd) 1966 mapping west of Mount Fitch No 1 grid.

D52/B7-424

TO ACCOMPANY RECORD No. 1969/23

RUM JUNGLE DISTRICT

SHEET E 42 PLATE 5



Drawn by L Kerec 1967

LOCATION DIAGRAM

E31	E32	E33
E41	E42	E43
E51	E52	E53

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

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: D.O.Shatwell 1966

REFERENCE

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Eld — *b.s. — black carbonaceous and/or graphitic slate, schist; ser.s. — sericitic slate, schist; am. — amphibolite*

MASSON FORMATION

ACACIA GAP TONGUE

Ela — *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*

Mapped outcrop and rock exposure

Gossan

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

>0·03 mr/hr, >0·04 mr/hr } Radiometric Contours

Strong, Medium } Axis of Slingram Anomaly

Area recommended for follow-up work

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

B.M.R. diamond drill hole

Rotary drill hole (B.M.R.)

Bulldozed costean

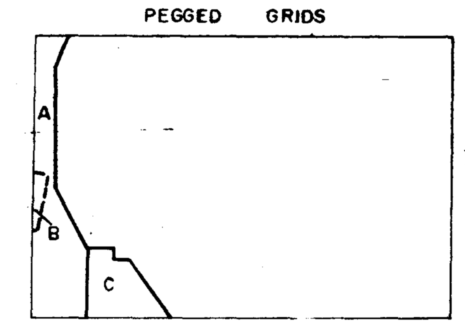
Vehicle track

Trig. station

Vein quartz

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

PEGGED GRIDS



A. MT. FITCH 1

B. MT. FITCH AREA

C. MT. FITCH 2

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.

TO ACCOMPANY RECORD No. 1969/23

D52/B7-425

RUM JUNGLE DISTRICT

SHEET E51

PLATE 6

LOCATION DIAGRAM

B 50	E41	E42
B 60	E51	E52
B 70	E61	E62

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
ser. sch. – sericite slate, schist; biot. ser. sch. – biotite sericite schist; chl.ser.sch; chlorite sericite schist; fer. slt. — ferruginous siltstone; am. – amphibolite.

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

0·03 mr/hr, 0·04 mr/hr, 0·05 mr/hr, 0·10 mr/hr — Radiometric Contours

XXX XXX Medium Axis of Slingram Anomaly

Formation boundary

Lithological boundary

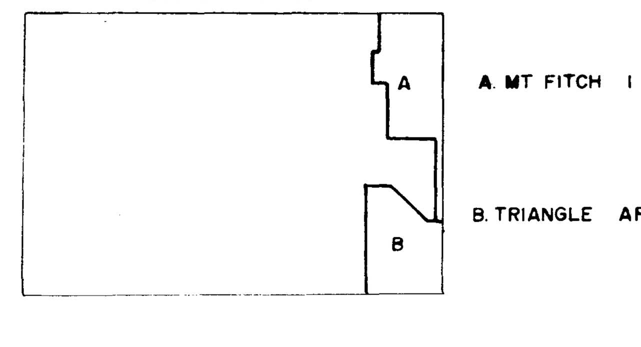
Outcrop and rubble boundary

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

Vein quartz

Quartz rubble

PEGGED GRIDS



A. MT FITCH I

B. TRIANGLE AREA

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

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

Compilation based on:

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

(2) Spratt (T.E.P. Ltd), Mt. Fitch No I grid.

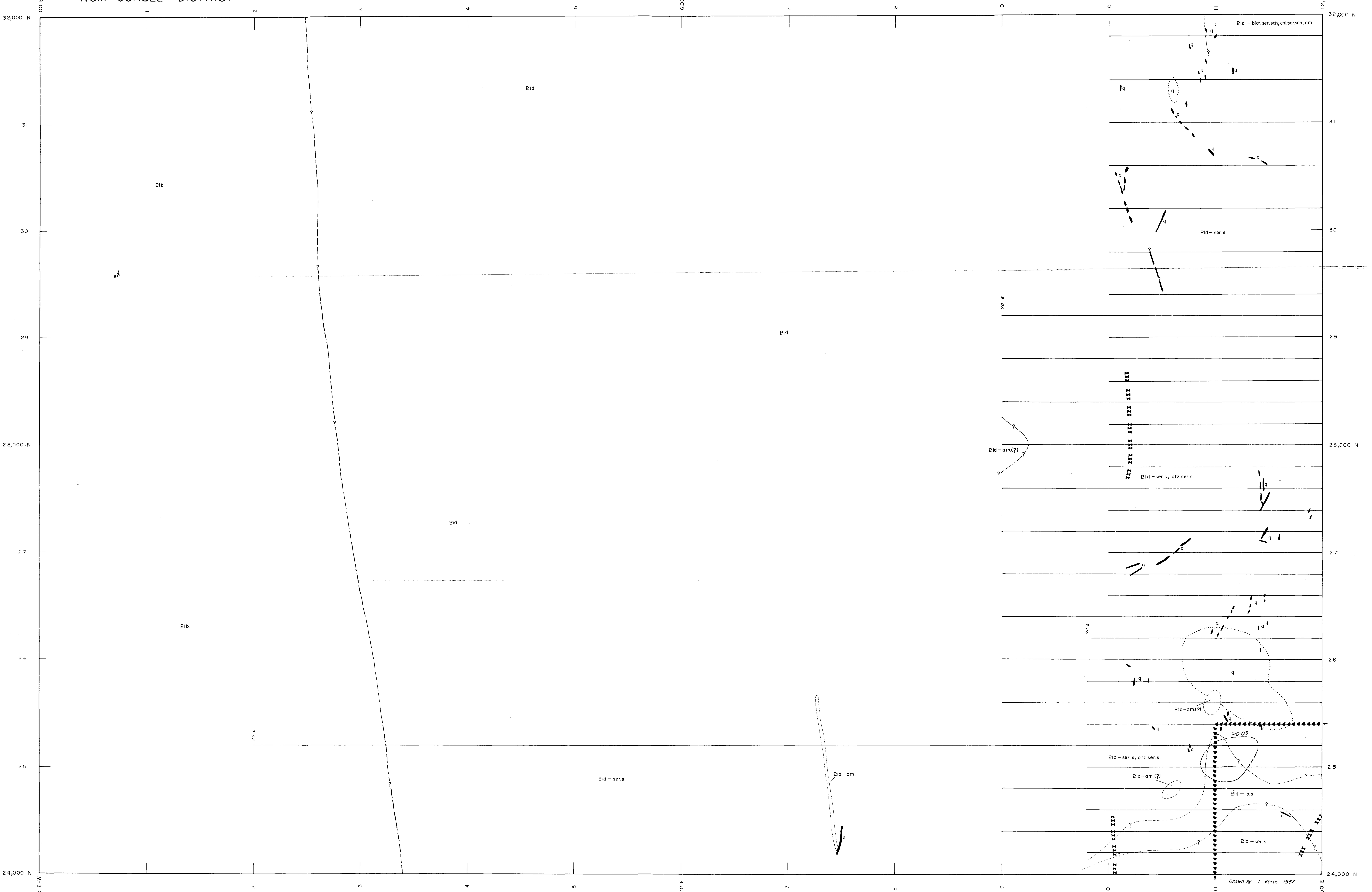
(3) Marjoribanks (T.E.P. Ltd) mapping west of Triangle Area 1966 survey.

D52/B7-426

TO ACCOMPANY RECORD No. 1969/23

RUM JUNGLE DISTRICT

SHEET E61 PLATE 7



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.

Vein quartz

Quartz rubble

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by Y. Miezitis, March 1967

SCALE

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

>0·03 mr/hr Radiometric Contours

Medium Axis of Slingram Anomaly

Area recommended for follow-up work

Formation boundary

Lithological boundary

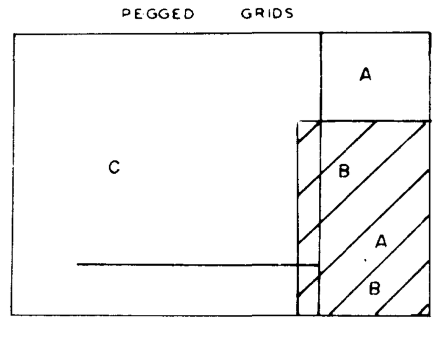
Outcrop and rubble boundary

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 Shatwell, Triangle Area 1964 survey, B.M.R. Record 1965/254

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

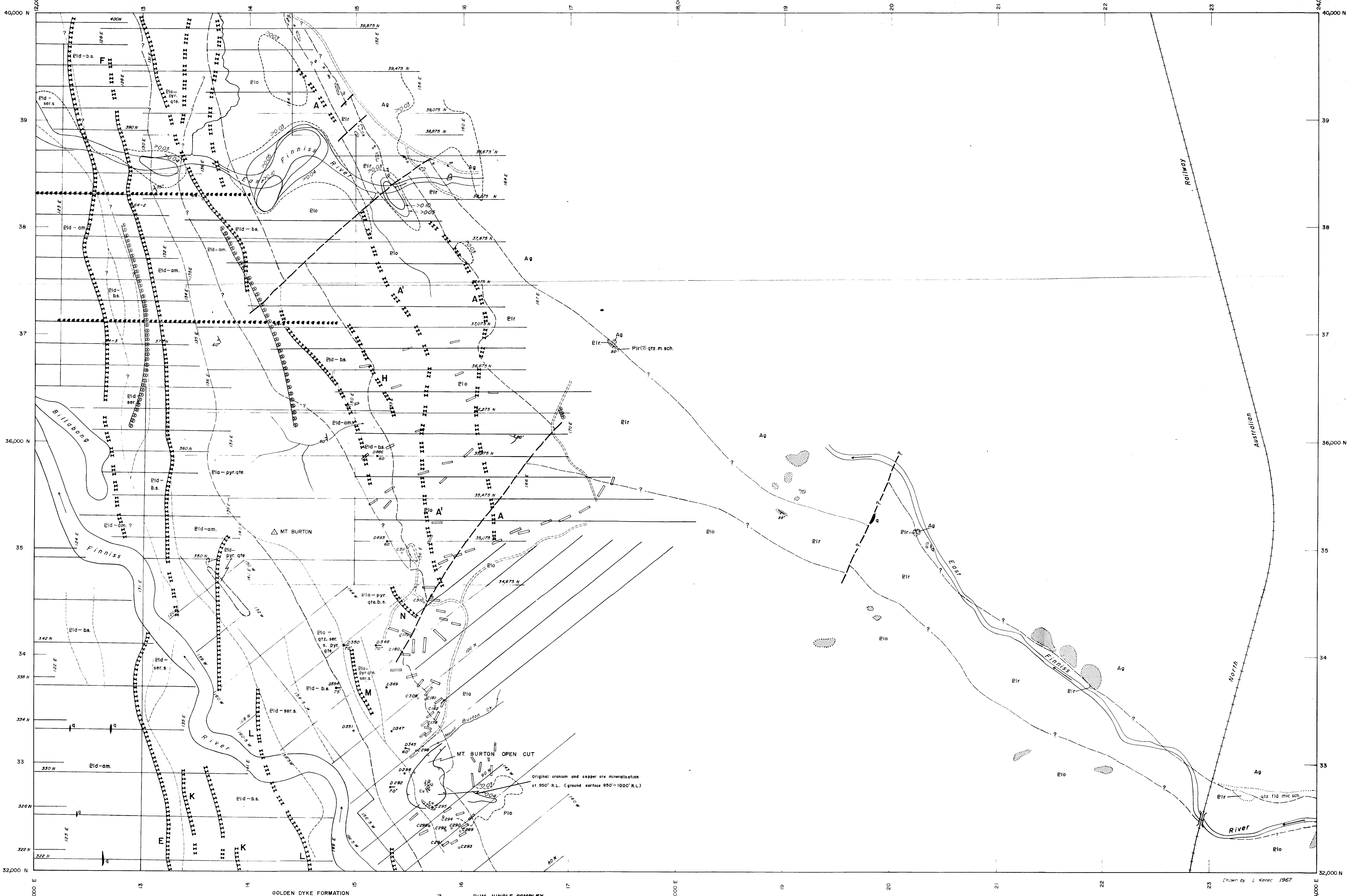
(3) Marjoribanks (T.E.P. Ltd) mapping west of Triangle Area 1966 survey.

D52/B7-427

TO ACCOMPANY RECORD No. 1969/23

RUM JUNGLE DISTRICT

SHEET E52 PLATE 8



Drawn by L Kerec 1967.

LOCATION DIAGRAM

E41	E42	E43
E51	E52	E53
E61	E62	E63

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

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: D.O. Shatwell 1966

Amended by: Y. Miezitis January 1967

REFERENCE

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Eld — b.s. — black carbonaceous and/or graphitic shale, slate, schist; chl.s. — chloritic schist, slate, ser. s. — sericitic schist, slate; qtz. — quartz; qte. — quartzite; am. — amphibolite

MASSON FORMATION

ACACIA GAP TONGUE

Ela — pyr. qte. — pyritic quartzite; b.s. — black shale, gy.s. — grey slate; ser. s. — sericitic slate, schist

COOMALIE DOLOMITE

Elo — dolomite, tremolitic schist, chloritic dolomite, kaolinitic schist, sandstone

CRATER FORMATION

Elr — 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

Mapped outcrop and rock exposure

Uranium and copper mineralisation

SCALE

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

>0·03 mr/hr, >0·04 mr/hr, >0·05 mr/hr, >0·10 mr/hr — Radiometric Contours

Strong, Medium — Axis of Slingram Anomaly

Strong — Axis of Magnetic Anomaly

Area recommended for follow-up work

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

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.

Vein quartz

PEGGED GRIDS

A. MT. FITCH 1

B. MT. FITCH 2

C. DOLERITE RIDGE EXT.

D. TRIANGLE AREA

E. AIR PHOTO MAPPING

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

Compilation based on:

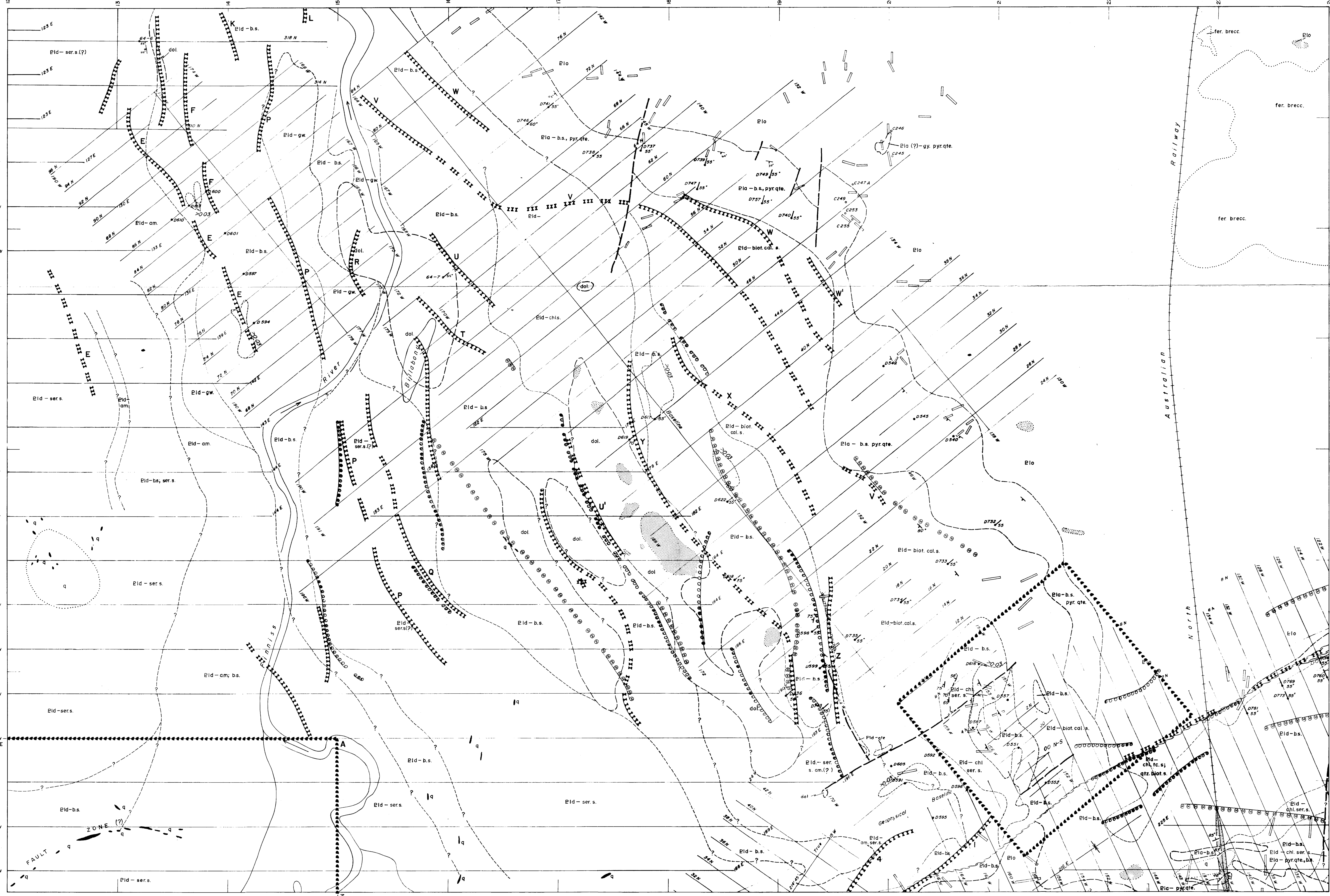
(1) T.E.P. Ltd geological data from diamond and churn drill holes, field mapping, Mt. Burton open cut plans.

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

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

TO ACCOMPANY RECORD No. 1969/23

D52/B7-428



LOCATION DIAGRAM

E51	E52	E53
E61	E62	E63
E71	E72	E73

MAGN... T.E.P. mine grid North ... True

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: D.O.Shatwell 1966.

Amended by: Y. Miezitis December 1966

REFERENCE

? TERTIARY

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

Mapped outcrop and rock exposure

Gossan

? PROTEROZOIC

dol. — dolerite

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Eld — b.s. — black carbonaceous and/or graphitic slate, schist, shale; chl. s. — chloritic schist, slate; ser. s. — sericitic schist, slate; g.w. — 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

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

COOMALIE DOLOMITE

Elo — dolomite, tremolitic schist, quartzite

SCALE

400 — 800 — 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

>0·03 mr/hr — Radiometric Contours

Strong / Weak — Axis of Magnetic Anomaly

Strong / Medium — Axis of Slingram Anomaly

Strong / Weak — Axis of Turam Anomaly

Area recommended for follow-up work

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.

70 — Dip and strike of bedding

85 — Dip and strike of foliation

D733 55° — T.E.P. diamond drill hole, showing direction and depression where hole is inclined

64-7 — B.M.R. diamond drill hole

C253 — T.E.P. churn drill hole

Bulldozed costean

q — Vein quartz

q — Quartz rubble

PEGGED GRIDS

A. MT. FITCH I

B. WEST FINNISS

C. TRIANGLE GRID

D. DOLERITE RIDGE EXTENDED

E. DOLERITE RIDGE EAST

F. DOLERITE RIDGE

G. BROWNS S.W.

H. AREA 55

Compilation based on:

(1) MacKay, Gates and Carter, Browns S.W. 1950–1951 mapping (B.M.R. map NT 47 G–2)

(2) T.E.P. Ltd geological data along Mt. Burton – Browns S.W. line

(3) Ruxton and Shields, West Finniss and Dolerite Ridge 1961 survey, B.M.R. Record 1963/49.

(4) Yeaman and Pritchard, Browns S.W. to Dolerite Ridge Extended 1963 survey, B.M.R. Record 1965/113.

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

(6) Spratt (T.E.P. Ltd), Mt Fitch No I 1965 survey

(7) Prichard, diamond drilling 1964, B.M.R. Record 1964/179.

(8) Berkman (T.E.P. Ltd), Finniss-Anabranch, 1966 survey.

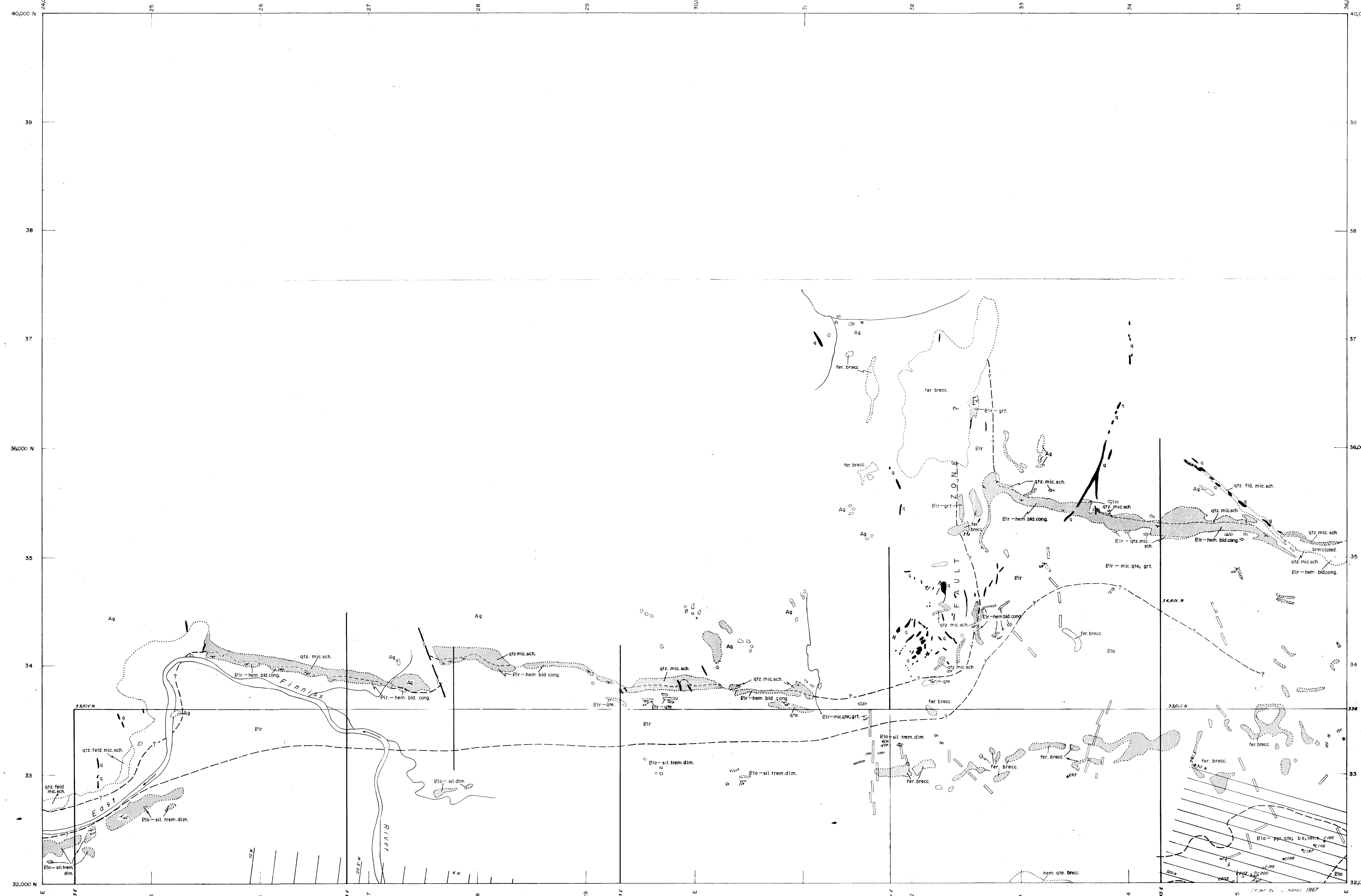
D52/B7-429

TO ACCOMPANY RECORD No. 1969/23

RUM JUNGLE DISTRICT

SHEET E53

PLATE 10



E42	E43	E44
E52	E53	E54
E62	E63	E64

LOCATION DIAGRAM

REFERENCE

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

? LOWER PROTEROZOIC ? TERTIARY

fer. brecc. — ferruginous breccia and ferruginised sediments.

hem. qte. brecc. — hematitic quartzite breccia.

LOWER PROTEROZOIC

MASSON FORMATION

ACACIA GAP TONGUE

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

COOMALIE DOLOMITE

Elo — *sil. trem. dlm. — silicified tremolitic dolomite. Undifferentiated dolomite, tremolitic dolomite, mudstones, chloritic slates.*

CRATER FORMATION

Elr — *qtz. mic. sch. — quartz mica schist; hem. bld. 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

RUM JUNGLE COMPLEX

Ag — *Undifferentiated granite, gneiss*

SCALE

400 0 400 800 Feet

400 ft to 1 inch

LEGEND

Magnetic and Slingram traverses

Fault

Formation boundary

Lithological boundary

Outcrop and rubble boundary

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

Strike and dip of bedding.

Strike and dip of cleavage, schistosity

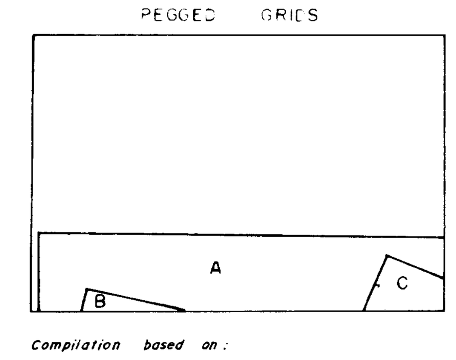
T.E.P. Churn drill hole

Bulldozed costean

Mapped outcrop and rock exposure

Vein quartz

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.

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: Y. Miezitis October 1966.

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

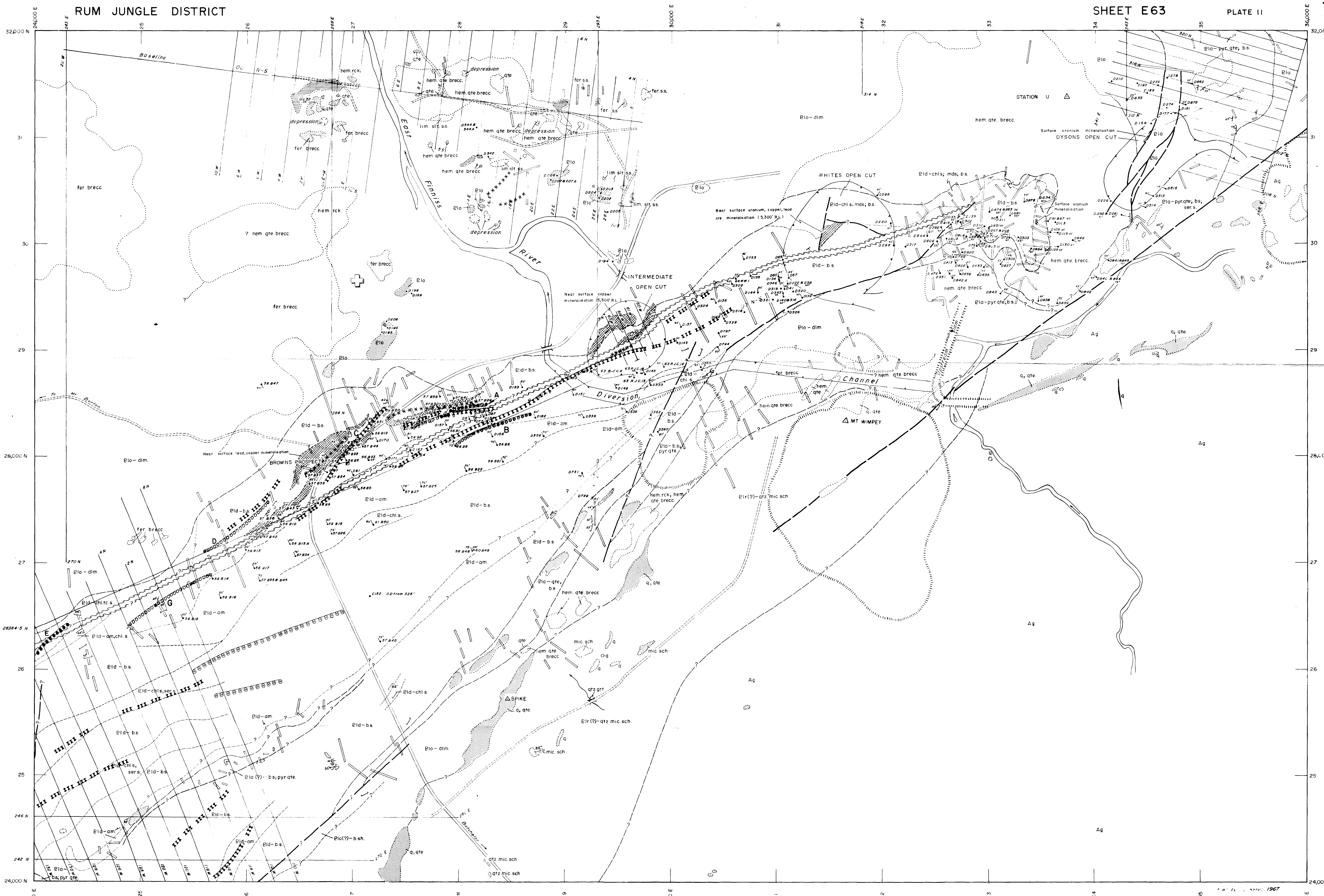
D52/B7-430

TO ACCOMPANY RECORD No. 1969/23

RUM JUNGLE DISTRICT

SHEET E63

PLATE II



Drawn by ... 1967

E52	E53	E54
E62	E63	E64
E72	E73	E74

LOCATION DIAGRAM

REFERENCE

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

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: Y. Miezitis June 1966

Amended by: Y. Miezitis February 1967

? TERTIARY

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

fer. s.s — ferruginous sandstone. (laterite)

Mapped outcrop and rock exposure

Phosphate rock

Base metal and uranium mineralisation

Vein quartz

Vein quartz and quartzite

? 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; pyr.qte. — 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.

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

ARCHAEAN

RUM JUNGLE COMPLEX

Ag — Undifferentiated granite, gneiss.

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

Gravity 'High'

Strong Axis of SP Anomaly

Strong Axis of Magnetic Anomaly

Strong / Medium Axis of Slingram Anomaly

Strong Axis of Turam Anomaly

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

D731 — T.E.P. diamond drill hole showing direction and depression where hole is inclined

63 R.J.C. 13, 56 B1 — A.M.&S. diamond drill hole

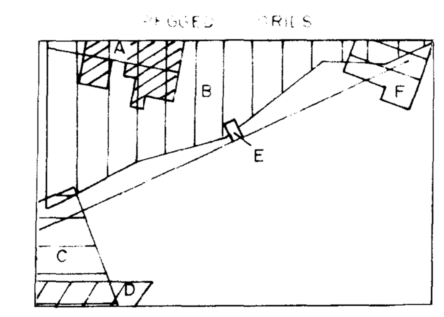
D.G. 33 — B.M.R. diamond drill hole

B. I. — Bore hole (drilled Commonwealth 1914)

Mine shaft, accessible

Mine shaft, inaccessible

PEGGED AREAS



A. BUCKSHEE & POWERPLANT

B. EMBAYMENT NORTH

C. BROWNS S.W. AREA

D. TRIANGLE AREA

E. INTERMEDIATE

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.

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) Yeoman 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.

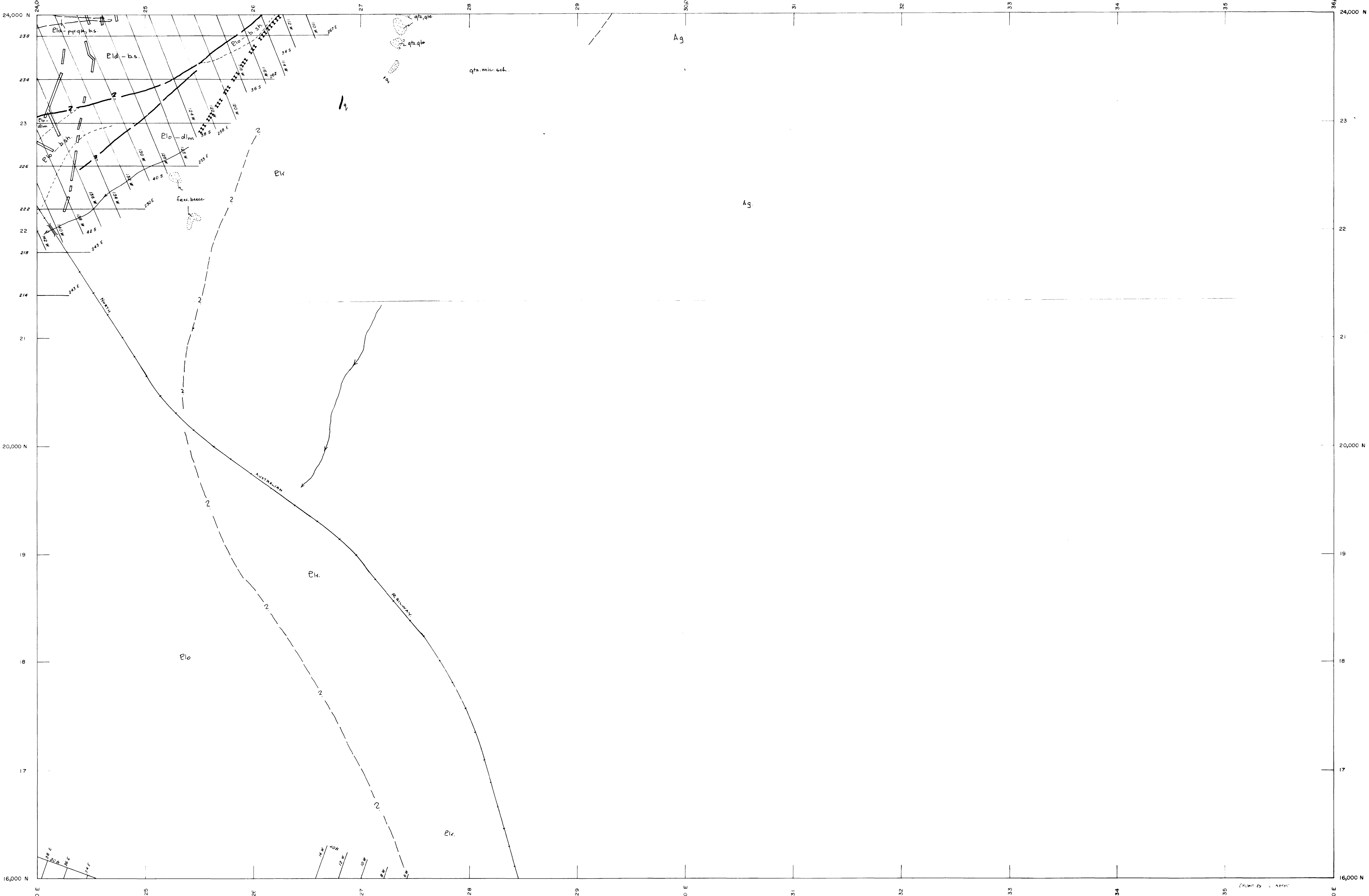
(8) Berkman (T.E.P. Ltd), Dysons North, 1966 survey.

TO ACCOMPANY RECORD No. 1968/[illegible]

D52/B7-431

RUM JUNGLE DISTRICT

SHEET E 73 PLATE 12



LOCATION DIAGRAM

E62	E63	E64
E72	E73	E74
E82	E83	E84

REFERENCE

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: Y. Miezitis 1967.

? TERTIARY

fer. brecc. - ferruginous breccia (laterite)

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Eld — bs. - black carbonaceous and/or graphitic slate.

MASSON FORMATION

ACACIA GAP TONGUE

Elo — b.s. - black carbonaceous and/or graphitic slate; pyr. qte. - pyritic quartzite.

COOMALIE DOLOMITE

Elo — dlm. - dolomite; b.sh. - black shale.

CRATER FORMATION

Elk — Undifferentiated - arkose, quartzite, "hematitic boulder conglomerate."

UNDIFFERENTIATED

qtz. mic. sch - quartz mica schist;

ARCHAEAN

RUM JUNGLE COMPLEX

Ag — undifferentiated granite gneiss

SCALE

400 — 800 — 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

IIIII Strong, III III Medium } Axis of Slingram Anomaly

Formation boundary

Lithological boundary

Outcrop and rubble boundary

Fault.

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

bulldozed costean.

Mapped outcrop and rock exposure

Vein quartz

qtz. qte. Vein quartz and quartzite

PEGGED GRIDS

A BROWNS S.W. AREA

B. TRIANGLE AREA

compilation based on:

(1) Mackay, Coles and Carter 1950-1951 mapping (B.M.R. map NT 47 6-2)

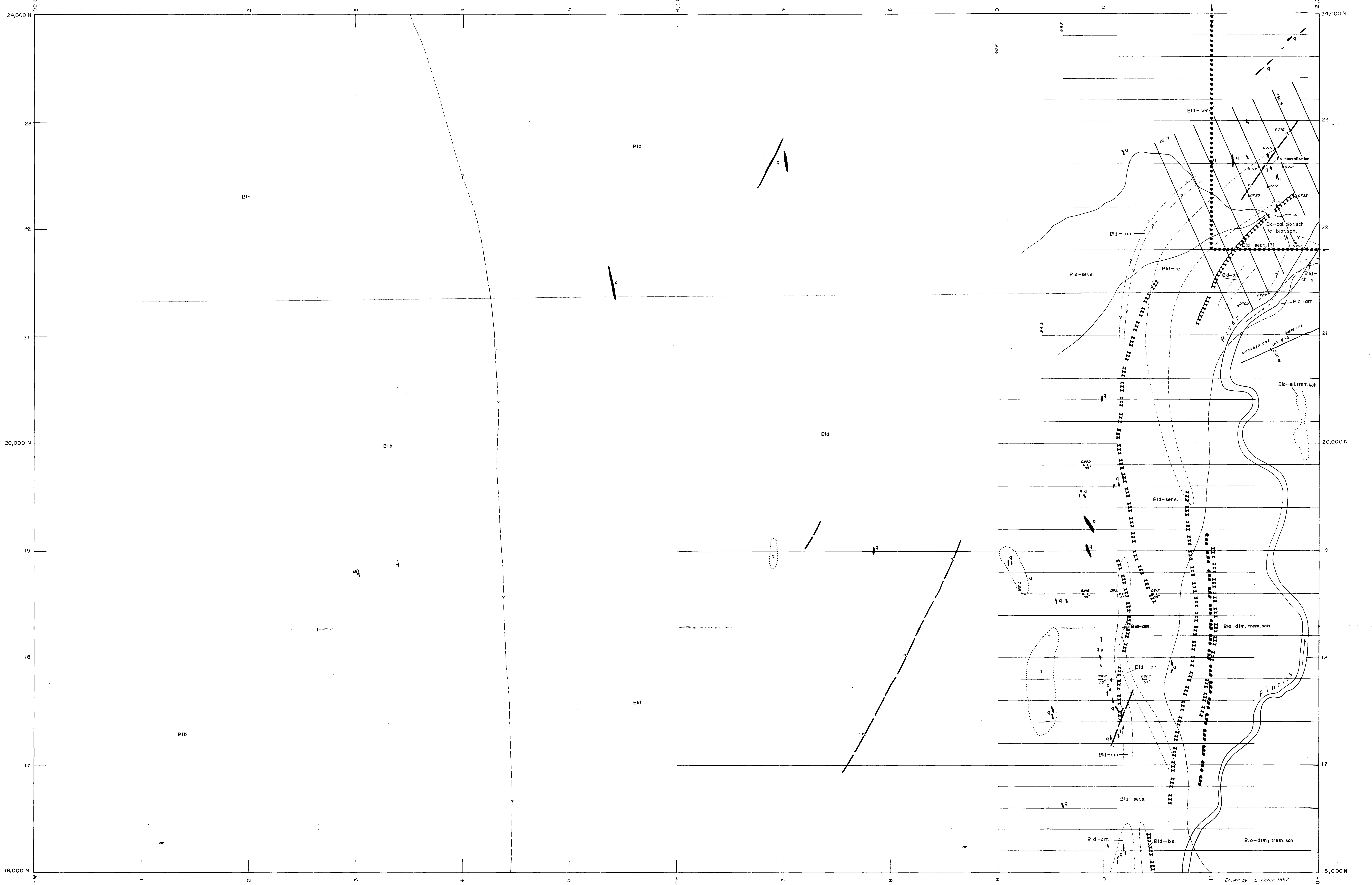
(2) Spratt (T.E.P. Ltd) Brown's South West 1964 survey.

TO ACCOMPANY RECORD No. 1969/23 D52/B7-432

RUM JUNGLE DISTRICT

SHEET E 71

PLATE 13



B 70	E 61	E 62
B 80	E 71	E 72
B 90	E 81	E 82

LOCATION DIAGRAM

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

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: Y. Miezitis, March 1967

REFERENCE

LOWER PROTEROZOIC

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

Ɛld — 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

Ɛlo — COOMALIE DOLOMITE
dlm. – dolomite; trem. sch. – tremolite schist; sil. trem. sch. – silicified tremolite schist;

q *Vein quartz*

(q) *Quartz rubble*

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

Strong / Medium — Axis of Slingram Anomaly

Weak — Axis of Turam Anomaly

Area recommended for follow-up work

Formation boundary

Lithological boundary

Outcrop and rubble boundary

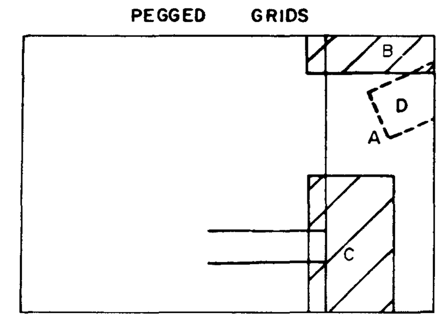
Fault

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

Strike and dip of bedding

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) *Ruxton 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) *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) *Marjoribanks (T.E.P. Ltd.), mapping west of Triangle Area 1966 survey.*

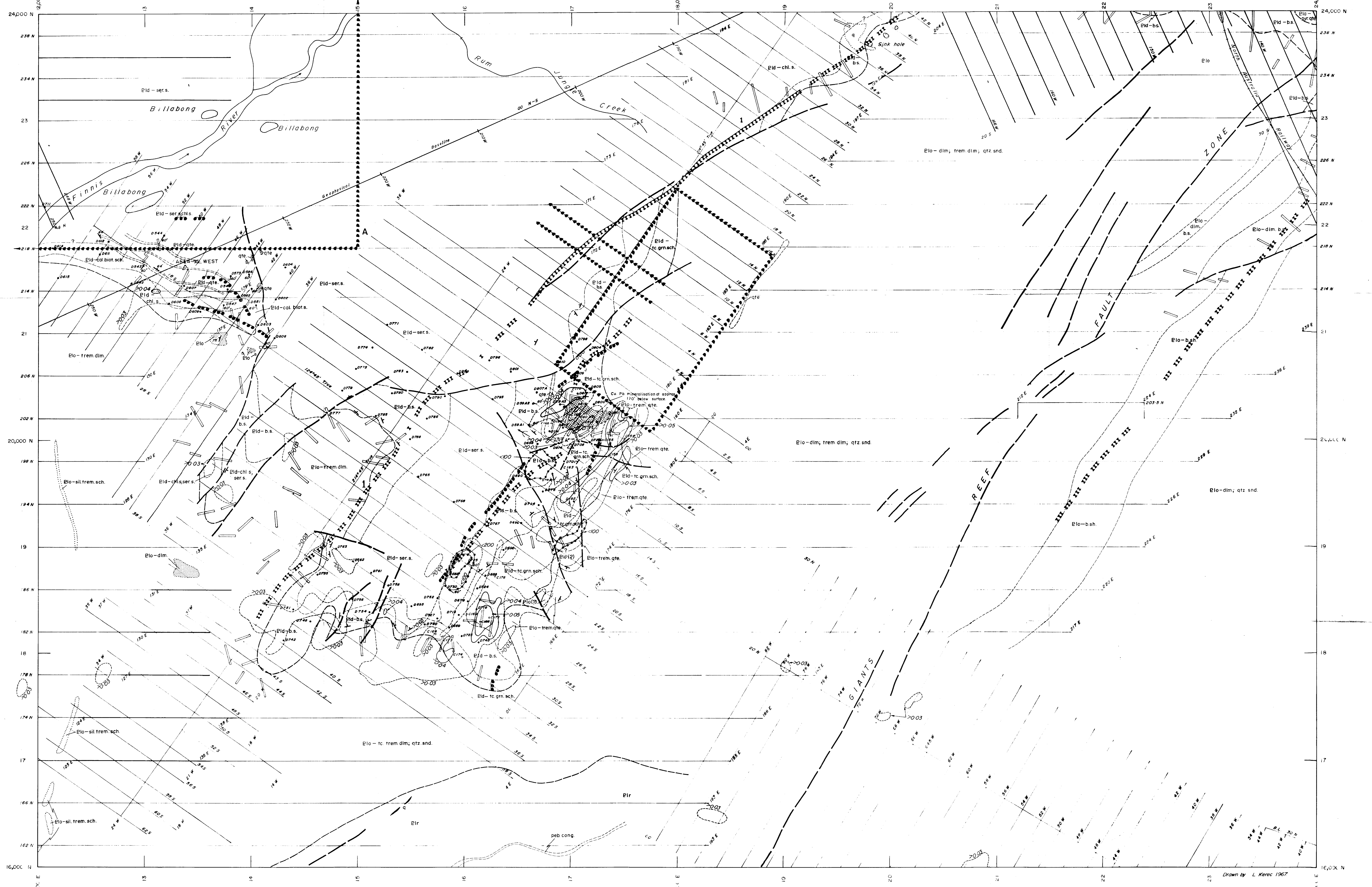
TO ACCOMPANY RECORD No. 1969/23

D52/B7-433

RUM JUNGLE DISTRICT

SHEET E 72

PLATE 14



LOCATION DIAGRAM

E61	E62	E63
E71	E72	E73
E81	E82	E83

REFERENCE

MAJOR GRID TEP mine grid, North 359°58'00" True

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: D.O.Shatwell 1966

Amended by: Y. Miezitis May 1967

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION (Eld)

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.

MASSON FORMATION
ACACIA GAP TONGUE (Ela)

py. qte.– pyritic quartzite; b.s.– black slate.

COOMALIE DOLOMITE (Elo)

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.

CRATER FORMATION (Elr)

peb. cong.– pebble conglomerate
Undifferentiated arkose, pebble conglomerate

Vein quartz
Quartz rubble
Sink hole

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

Mapped outcrop and rock exposure

Base metal mineralisation

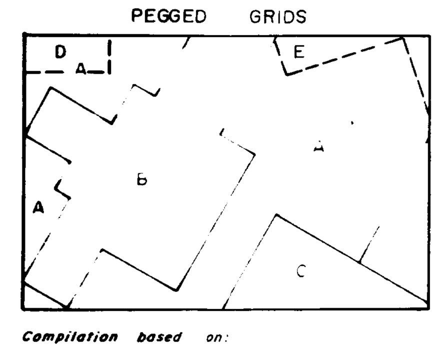
LEGEND

- >0·03 mr/hr, >0·04 mr/hr, >0·05 mr/hr } Radiometric Contours
- <100 mv, <200 mv } SP Contours
- Strong, Medium, Weak } Axis of Slingram Anomaly
- Strong, Weak } Axis of Turam Anomaly
- Area recommended for follow-up work

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
T.E.P. diamond drill hole showing direction and depression where hole is inclined (D725 60°)
A M&S diamond drill hole (D59A2 60°)
B.M.R diamond drill hole (D.G.17)
Churn drill hole (T.E.P) (C166)
Bulldozed costean
Trig. station

TO ACCOMPANY RECORD No. 1969/23

PEGGED GRIDS



A. TRIANGLE AREA
B. AREA '55'
C. ZETA AREA and AREA 55 West
D. FINNISS ANABRANCH
E. BROWNS S.W.

Compilation based on:

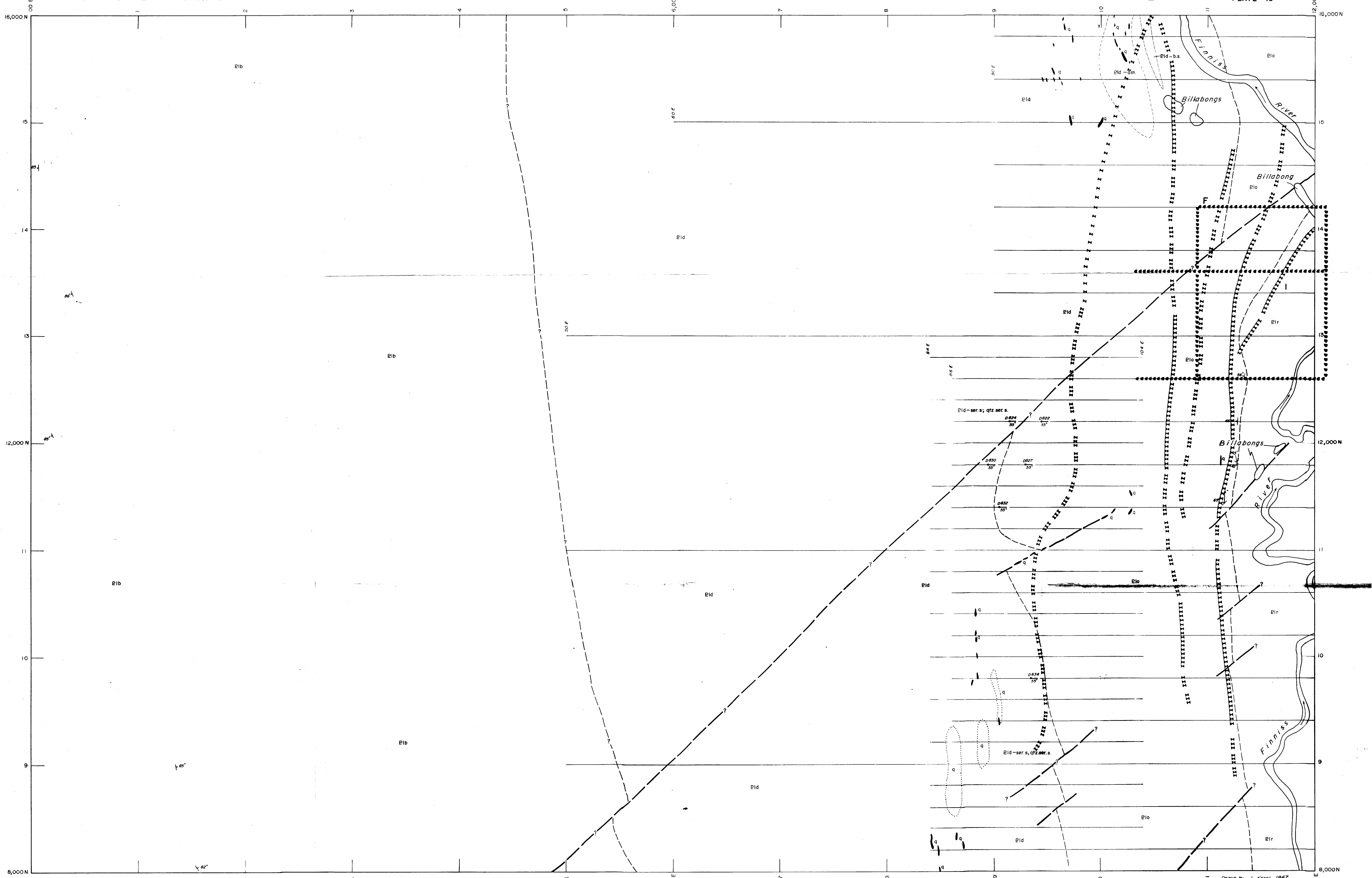
(1) **T.E.P Ltd. geological data of Area 55 to Area 55 West.**
(2) **Ruxton and Shields,** Area 55 to Area 55 West, 1961–1962 surveys, B.M.R **Record Nos. 1963/49 & 1963/131.**
(3) **Pritchard, Area 55** 1963 mapping, B.M.R. Record No 1964/150.
(4) Yeaman and Pritchard, Browns S.W. to Area 55 1963 survey, 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

D52/B7-434

RUM JUNGLE DISTRICT

SHEET E 81

PLATE 15



LOCATION DIAGRAM

B80	E71	E72
B90	E81	E82
B100	E91	E92

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

REFERENCE

LOWER PROTEROZOIC

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

Ꞓld GOLDEN DYKE FORMATION
b.s.—black carbonaceous and/or graphitic slate; ser.s.—sericitic slate; qtz.ser.s.— quartz sericite slate. am.—amphibolite.

Ꞓlo COOMALIE DOLOMITE
Undifferentiated dolomite, tremolite schist.

Ꞓlr. CRATER FORMATION
Undifferentiated siltstone, arkose, conglomerate.

q Vein quartz

q Quartz rubble

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

LEGEND

Strong, Medium, Weak — Axis of Slingram Anomaly

Area recommended for follow-up work

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

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: Y. Miezitis, March 1967.

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

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.

TO ACCOMPANY RECORD No. 1969/23

D52/B7-435

RUM JUNGLE DISTRICT

SHEET E 82

PLATE 16

LOCATION DIAGRAM		
E71	E72	E73
E81	E82	E83
E91	E92	E93

REFERENCE

GEOLOGY

Compiled by: Y. Miezitis November 1966

? TERTIARY

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

fer. ss. — ferruginous sandstone (laterite)

Mapped outcrop and rock exposure

Phosphate rock outcrop

? LOWER PROTEROZOIC

hem. qte. brecc — hematitic quartzite breccia

hem. rck. — hematitic rock; iron oxides, mainly hematitic

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION

Eld — *b.s. — black carbonaceous and/or graphitic slate, schist, shale; b.dlm.s. — black dolomitic slate; chl.s. — chloritic slate, schist; ser.s. — sericitic slate, schist; gy.s. — grey slate; am. — amphibolite.*

COOMALIE DOLOMITE

Elo — *dlm. — crystalline and slaty dolomite; dlm.s — dolomitic slate; trem.s. — tremolitic slate, schist; sil.dlm.brecc. — silicified dolomitic breccia.*

CRATER FORMATION

Elr — *peb.cong. — pebble conglomerate; Undifferentiated arkose; hematitic 'boulder' conglomerate.*

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

>0.03 mr/hr, >0.04 mr/hr — Radiometric Contours

Strong, Medium — Axis of Slingram Anomaly

Area recommended for follow-up work

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.)

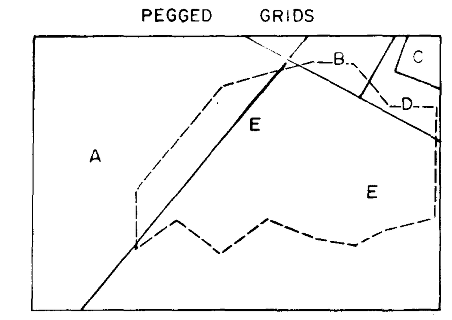
Bulldozed costean

Formed road

Vehicle track

Sink hole

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 1963/73

(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.

TO ACCOMPANY RECORD No. 1969/23 D52/B7-436

RUM JUNGLE DISTRICT

SHEET E83

PLATE 17

LOCATION DIAGRAM

REFERENCE

MAJOR GRID: TEP mine grid, North 359° 58'00" True

GEOLOGY

Compiled by : Y. Miezitis December 1966.

? TERTIARY

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

fer. ss. — ferruginous sandstone. (laterite)

Mapped outcrop and rock exposure

Phosphate rock

Uranium mineralisation

? 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 slate.*

CRATER FORMATION

Elr — *arkose pebble conglomerate, hematitic boulder conglomerate, quartzite, slate.*

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

>0·03 mr/hr, >0·04 mr/hr, >0·05 mr/hr — Radiometric Contours

Strong, Medium — Axis of Slingram Anomaly

Strong, Weak — Axis of Turam Anomaly

Area recommended for follow-up work

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

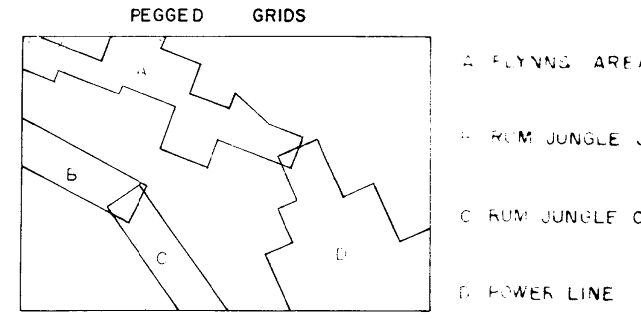
Formed road

Vehicle track

Trig. station

Vein quartz

PEGGED GRIDS



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.

TO ACCOMPANY RECORD No. 1969/23

D52/B7-437

LOCATION DIAGRAM

E82	E83	E84
E92	E93	E94
F 2	F 3	F 4

REFERENCE

? 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.

LOWER PROTEROZOIC

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

COOMALIE DOLOMITE

Elo — dlm. — dolomite; mds. — mudstone; Undifferentiated dolomite, tremolitic dolomite, dolomitic black and chloritic shale, mudstone.

MAJOR GRID ... mine grid North ... True

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: Y. Miezitis, D.O. Shatwell, February 1967.

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

LEGEND

>0.03 mr/hr
>0.04 mr/hr
>0.05 mr/hr
>0.075 mr/hr
>0.10 mr/hr
} Radiometric Contours

Strong / Medium } Axis of Slingram Anomaly

Strong / Weak } Axis of Turam Anomaly

Area recommended for follow-up work

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.
D700 T.E.P. diamond drill hole
DG 18 B.M.R. diamond drill hole
R21 B.M.R. Rotary drill hole
C277 T.E.P. churn drill hole.
Gravel pit
Sinkhole
Formed road
Vehicle track
Trig. station

PEGGED GRIDS

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.

TO ACCOMPANY RECORD No. 1969/23

D52/B7-438

RUM JUNGLE DISTRICT

SHEET E94

PLATE 19

LOCATION DIAGRAM

E83	E84	E85
E93	E94	E95
F3	F4	F5

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

REFERENCE

? TERTIARY

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

LOWER PROTEROZOIC

Eld — GOLDEN DYKE FORMATION
b.s. - black carbonaceous and/or graphitic slate, schist; chl.s. - chloritic slate, schist; am. - amphibolite

Elo — COOMALIE DOLOMITE
undifferentiated dolomite, mudstone.

UNDIFFERENTIATED
calc. b.s. - calcareous black slate, am. - amphibolite

SCALE

400 0 400 800 1200 Feet

400 ft to 1 inch

LEGEND

>0.03 mr/hr, >0.04 mr/hr, >0.10 mr/hr } Radiometric Contours

Strong, Medium } Axis of Slingram Anomaly

Strong, Weak } Axis of Turam Anomaly

Area recommended for follow-up work

Formation boundary

Lithological boundary

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

D.647 T.E.P. diamond drill hole

C276 T.E.P. churn drill hole

PEGGED GRIDS

A POWER LINE

B BATCHELOR LATERITES & EXTENDED

COMPILATION OF GEOPHYSICAL DATA, HUNDRED OF GOYDER NT

Bureau of Mineral Resources, Geology and Geophysics

GEOLOGY

Compiled by: Y. Miezitis, D.O. Shatwell, February 1967.

TO ACCOMPANY RECORD No. 1969/23

D52/B7-439