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PROGRESS REPORT ON

MT. TYNDALL LEASE

E.L. 9/66

UP TO JUNE 1969

Mt Lyell

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29.7.69

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MAPS AND FIGURES

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1. INTRODUCTION

The following report includes a comprehensive appraisal of activities on the Mt. Tyndall Lease for the 1968/69 financial year, and recommendations, including budget, for the 1969/70 year.

The report has been designed so as not to duplicate information contained in the 1967/68 annual report. Therefore certain sections, notably the geological report, are supplementary to, and not repetitive of, earlier reports.

All field information has been plotted on 500':1" sections and plans. There are approximately 36 sections and 25 plans in current usage, and it seems impractical to include all of these in a report of this nature. Consequently a reduced number of 2":1 mile plans only, are presented here.

2. PREVIOUS WORK

2.1 The Mt. Lyell Mining and Railway Co. Ltd. 1907 and 1938

The above company held mineral rights in the Red Hills area in 1907. They "lengthened two of the existing adits, drove crosscuts from a winze, and cut several trenches. A precise sampling campaign throughout the openings was then instituted but no further work was attempted"[1]

Comprehensive assay plans of this work are available. They appear interesting and should be of considerable use next season. Further reference will be made to this work later in this report.

The Mt. Lyell Mining and Railway Company Limited also held mineral rights in the Lake Dora area in 1938, and carried out a sampling programme in May of that year. "Samples were broken from all the old workings and assayed for copper......The highest assay obtained was 1.8% copper.... and the average value of 22 samples taken was o.24% copper"[2]

2.2 Rio Tinto Australian Exploration Pty. Ltd. 1957 - 1961

The above company carried out airborne magnetic and electrical surveys, followed by appropriate ground work on four major areas within the Mt. Tyndall Lease viz: White Spur, Howard, Gooseneck, and Lake Dora. The majority of their reports and plans on this work are available and will be referred to later in this report. They drilled one hole in the White Spur area, and four in the Gooseneck area.

It is believed the E.Z. Company also drilled at least one hole in the Red Hills area in conjunction with Rio Tinto.

2 Rio Tinto did some very good work in these area but,

for reasons unknown (probably financial) they did not drill some of their more interesting anomalies, notably Howard's anomaly and the Lake Dora anomalies.

2.3 E.Z. Company

It would appear that the E.Z. Company carried out extensive ~~and~~ geophysical surveys (I.P.) in the Red Hills area and followed this up with at least three drill holes. The results of this work are not yet available to us, but it is anticipated that E.Z. (Rosebery) will make them available in the very near future. This work should be invaluable in an early assessment of the potential of the Red Hills area.

3. ACCESS DEVELOPMENT

The following budget figures are of interest in this section.

Season	1966/67	1967/68	1968/69	1969/70 (Estimated)
Roads	$16,068.00	$25,933.00	$30,000	$18,000
Tracks and Traverse Lines	$18,702.00	$23,686.00	$ 6,945	$ 2,000
Total Access Costs	$34,770.00	$49,619.00	$36,945	$20,000
% Budget	57%(approx)	60%(approx)	55%(approx)	20%

FIG 1 Tyndall Access Costs

Existing and proposed access (1969/70) are shown on Map 2. Total access costs to date are approximately $120,000.00.

3.1 Road Construction during 1968/69

3.1.1 Red Hills Road: The Eastern Access road (Bradshaw's Timber road) was extended North for 3.5 miles to give access into the heavily timbered Mt. Read area and onto the open Red Hills plateau.

3.1.2 Lake Rolleston Road: Approximately 2 miles of road running due East from Newton Creek through the Tyndall Range towards Lake Rolleston were constructed to give access to the essentially open land between Lake Dora and Red Hills.

3.1.3 Pickands Mather's Drill Access Road: Approximately 4 miles of access road were built by Pickand's Mather to give access to a drill site just South of the Mt. Tyndall Lease, 2 miles of this road being on the Mt. Tyndall Lease. The road runs roughly parallel to the Cambrian - Ordovician contact and could be very useful to the Syndicate in the future.

3.1.4 Howard's Lower Road: Approximately one (1) mile of timber access road was constructed by R.J. Howard (at no cost to the Syndicate) to the east of the existing major western access road. This road has been very useful as it passes over, or adjacent to, several I.P. anomalies, which, until this road was constructed, were covered by glacials.

3.1.5 Others: Useful foot access has been provided both on the west and east of the Henty River by the two timber getting concerns working in the area. It is reasonable to expect similar assistance in this manner from them in the coming season also.

3.2 Track cutting during 1968/69

3.2.1 Pack Track Clearing: The old foot track running from the western road near the Hercules Mines, around the southern flanks of Mt. Read to the Henty River - Eastern road junction was cleared (2 miles) and provided useful access and outcrop. The track running from the summit of Mt. Read to the Red Hills road and then North-West along the Mt. Read tramway was also reopened. This track still has to be opened up between Red Hills and the Northern Lease boundary.

3.2.2 Traverse Line Cutting: Approximately 175,000 feet of traverse lines were cut by a gang of bushmen working on a contract rate of $40/thousand feet. The existing 1967/68 grid was extended North as shown on Map 2 and included lines 40 to 66 on the eastern grid, and lines 30 to 58 on the western grid. Three other lines were cut over Howard's Anomaly between line 18 and line 24. The contract rate is high but is still more economical than cutting on wages, although the quality of tracks on contract was lower. Appropriate recommendations are made later in this report.

4. GEOLOGICAL MAPPING

As mentioned earlier, this is not a full geological report on the Tyndall Lease but rather a collection of observations of major significance which it is hoped, will be a useful guide for future exploration in the area. A regional geological map is appended (Map 3).

4.1 The Cambrian-Ordovician Relationship and Major Tectonic Movements in the Tyndall Area.

Perhaps the most comprehensive study of major West Coast tectonics is contained in two Rio Tinto reports completed about 1960. [4, 5]

The Rio Tinto geologists broadly postulated that the Cambrian Mt. Lyell Shear ran North from Mt. Lyell, along the Western flanks of the Tyndall Range, through Gooseneck and on North through Rosebery, and that all major west coast orebodies were located along this shear zone or fault.

They also claim that this shear was later disrupted by two strong North-East to South-West transcurrent faults, one passing just South of Rosebery (Jupiter Fault) and the other just North of Mt. Murchison (Henty Fault). These faults were thus responsible for the South-West displacement of the Hercules orebodies from their original location as extensions of the Rosebery ore lenses.

It would appear that these broad structural theories governed the direction of all Rio Tinto work in the area (e.g. at White Spur, Gooseneck, Lake Dora.

These theories of Rio Tinto are probably quite sound, however, a broader approach to the geological assessment of any area is outlined below.

The major points are: (a) Any economical orebody will be within the Mt. Read Volcanics, and (b) such an orebody will be in schists (host rock). Further, it is usual at Tyndall for sheared Cambrian rocks to be mineralized, even if only with pyrite. Therefore it might follow that shearing of the volcanics made them more susceptible to penecontemporaneous primary sulphide concentration or that the localized presence of sulphide in a particular volcanic horizon made that volcanic more favourable to shearing, particularly if the shearing was not intense. However, the main point is that primary exploration targets should be sheared Mt. Read Volcanics. The age of shearing is also important. The fact that there are at Tyndall, large belts of mineralized sheared volcanics bearing no relationship to a disturbed Ordovician-Cambrian contact suggest two periods of ore concentration on the West Coast, in this volcanic environment: Firstly, primary ore concentration in sheared Cambrian rocks, the shearing being most intense during, and largely confined to, the Cambrian. That is, mineralisation of this type is independent of the Cambrian-Ordovician contact, such as at Rosebery and Hercules. Secondly, strong post-Cambrian movement along the Ordovician-Cambrian contact may have remobilized primary sulphide concentrations, or mobilized disseminated sulphides in general, and produced secondary ore concentrations along shear zones of major disturbance such as at Mt. Lyell. The movement would have been post-Ordovician.

Therefore more specifically, major exploration targets should be sheared Mt. Read Volcanics in a similar tectonic setting to either Rosebery or Mt. Lyell. In areas where a Rosebery type orebody would be expected, a further necessity would be the existence of an associated sequence of sheared Cambrian argillites (slates etc.) possessing, or capable of possessing, a hanging or foot wall relationship to the mineralized volcanics.

If all the above is reasonably logical, this would then bring several areas into prominence on the Tyndall Lease as primary exploration targets during the coming field season, viz. the Red Hills-Gooseneck area(Rosebery type) and the Lake Selina-Lake Dora area (Lyell type). In general the Red Hills to Lake Dora belt of volcanics is of primary importance.

4.1.1 The Cambrian-Ordovician Contact in the Red Hills-Gooseneck area;

The contact has not been observed but good outcrops immediately adjacent to it have permitted a reasonable assessment of its nature in many places.

The Ordovician is represented by a moderately thick sequence of Owen Conglomerate overlying a saccharoidal quartzite, popularly called the Tyndall Quartzite. The two are conformable. The quartzite is several hundred feet thick in the Newton Valley but absent in the Red Hills area, where the Owen Conglomerate lies directly and uncomformably on the Cambrian Mt. Read Volcanics. The conglomerate is anticlinally warped with moderate and uniform dips to the East and West, the dips increasing sharply to the East on the Eastern limb. There would appear to have been some moderate North-South compressional forces acting on the Ordovician producing broad superimposed gentle folds in the conglomerate (eg) immediately South of Gooseneck.

The Cambrian is represented in the Red Hills area by quartzitic, quartz-sericite, and chloritic schists derived from the Mt. Read Volcanics. They dip steeply (70 - 80°) and uniformly West, striking N.N.W. in the direction of Rosebery. Several miles to the South in the Newton Valley, a large thickness of Cambrian slates has been uncovered along the newly constructed Lake Rolleston Road, directly beneath the large anticlinal structure of Mt. Tyndall. The strike of the slates if maintained would place them to the immediate West of the Red Hills area, where they appear to be only very thin lenses. It would therefore appear that either this sequence of shales and slates thins rapidly North or is faulted off by an East-West fault along the upper reaches of the Henty River.

The unifrom attitudes of both the Cambrian and Ordovician in the Red Hills-Gooseneck-Newton Creek area is a major reason for believing the contact to be unconformable and only slightly disturbed by post Ordovician movement.

4.1.2 Cambrian-Ordovician Contact in the Selina-Dora area:

Little work has been done in this area to date but some general observations have been made and are discussed below. Detailed geological work here is difficult because of the extensive glacial deposits.

The Ordovician is represented by a thick sequence of Owen Conglomerate (probably several thousand feet), which lies unconformably on sheared Cambrian Volcanics. The contact in this area is more disturbed and it would be reasonable to assume that the contact is strongly sheared in places. Generally, the conglomerate dips steeply East, however there are some notable exceptions where it has been overturned with a "roll under" appearance thus dipping steeply West.

The Cambrian schists are often pyritic and have been worked in many places, the major of which are the Lake Dora mines and the Lake Selina mines. Old reports on these areas are available,[2] but are of limited use.

To the East, the Cambrian sequence abutts unconformably against the Precambrian quartzites of the Sticht Range. Very little is known of this contact and it probably warrants some attention.

There is considerable doubt as to what underlies the glacials between Selina and Dora, and it can only be said that there is no cause for believing that it is anything but Cambrian volcanics. Road construction and trenching in the area in the near future should confirm this.

4.2 Howard's Anomaly

This is an area of strong geochemical and geophysical interest but due to a lack of time and manpower, the area has not been mapped in detail but is strongly recommended for the coming season. Outcrop in creeks, trenches and roads in the area is good. There are two Rio Tinto reports available on this area[6, 7], and these represent the most useful geological work done to date on the anomaly.

Briefly, the area falls in a sequence of Cambrian volcanics and sediments lying to the immediate West of the Tyndall Range (Owen Conglomerate).

Only restricted zones within the area show any signs of shearing.

The volcanics consist of coarse agglomerates, rhyolitic, chloritic and haematitic tuffs, and fine grained rhyolites and keratophyres. A single bed of finely laminated, purple, haematitic tuff is predictably persistant throughout the area, between line 16 and line 26, and is very useful as a marker bed for mapping. The remainder of the volcanic sequence is very irregular and variable and difficult to map. Generally they are mineralized with varying amounts of pyrite, chalcopyrite, galena, and sphalerite. As a general rule, the coarser, more sheared volcanics carry heavier mineralization. Ferriginous and manganese gossans are widespread over the volcanics.

The well bedded sedimentary sequence lies conformably on the volcanics with dips of 50° - 60° to the East. The basal sediments are coarse and arkosic with a considerable coarse tuffaceous component. The upper members of the sequence are largely concealed.beneath a latral moraine but small exposures suggest they are finer quartzite-cherty sediments. If this is so, the area appears to be very similar to sections of the Comstock Valley. The coarser, lower, sediments are identical to those of the Comstock area.

The geology of this area is further discussed in some detail in section 5.2.3, and to a lesser extent in 6.2.3 and further reference should be made to Maps 9 and 10.

4.3 Ultra-basics

Two ultra-basic bodies were located during the season, one in the far south-west of the lease and the other in the Henty River gorge.

4.3.1 <u>South-West Ultra-basic</u>: This ultra-basic represents a differentiated, serpentinized core of a larger sill(?) like gabbroic intrusive. The gabbro appears to have intruded a sequence of shales and crystal tuffs on its Western flanks and coarse calcareous and tuffaceous sandstones on its Eastern flanks. Some of the sediments were caught up in the intrusive and now are represented by narrow stringers of phyllite within the gabbro.

The outer margins of the gabbro are medium grained but the central section adjacent to the serpentinite is very coarse grained with pyroxene laths up to 1" long.

Serpentinization of the central section of the gabbro reduced the pyroxenes to serpentine (pseudomorphs) and magnetite, (due to the release of iron oxide during alteration) which is distributed as fine grains along the fracture and clearage planes and around pyroxene boundaries. Not all the pyroxene was wholly affected by the serpentinization and remnants of the original grains are often present.

In the phyllitic inclusions, small veinlets of chrysotile fibres (asbestos) are prevalent.

The geochemical and geophysical expressions of this intrusive body are discussed under their relevant sections following.

4.3.2 Henty Ultra-basic: A small stock or dyke like body on the Henty end of line 28 on the Western grid. Little work has been done on this area yet and its extent and significance has not been determined. Several samples of surrounding country rock were analysed for Cu and Ni and the results are discussed in section 5.1.4 following. A report on these rocks is appended to this report also (Appendix I).

Further geological and geochemical work is recommended here. The area is extremely rugged and access is poor.

5. GEOCHEMISTRY

Geochemical surveys completed during the 1968/69 season are best discussed in two sections:

5.1 Reconnaissance surveys

5.2 Detailed surveys.

5.1 Reconnaissance Surveys:

These entailed soil sampling at 200' intervals on E-W traverse lines 0 - 25 miles apart. On the grid to the West of the Henty River, Lines 2 to 16 and lines 30 to 58 were sampled and on the grid to the East of the Henty, lines 40 to 66 were sampled. Sampling was done by means of a hand soil auger, 4'6" long. Samples were analysed by McPhar Geochemical and Mineralogical Laboratories using A.A.S. method for Cu, Pb and Zn and in some cases for Ni.

Results are plotted on 500':1" plans and anomalous areas are shown on Maps 6, 7 and 8 in this report.

Due to variations in soil and rock type over such a large area, normal statistical methods of calculating background values are subject to strong criticism. However, as a broad guide, the following values may be taken as thresholds; (i.e.) Values above these are probably anomalous

Cu: 100 p.p.m.

Pb: 200 p.p.m.

Zn: 250 p.p.m.

5.1.1 Cu Anomalies: Refer to Map 6. Copper anomalies (100 p.p.m.) are fairly scarce and very few additional anomalies of any significance were located during the reconnaissance surveys this season, apart from three samples taken in the Henty with values between 190 p.p.m. and 460 p.p.m. Ni values for these samples were also high (Refer to section 5.1.4)

5.1.2 Pb Anomalies: As would be expected, quite a number of Pb anomalies were obtained. Many of these are broad, low magnitude anomalies and probably reflect bedrock type variations rather that geochemical bedrock anomalies. Areas of interest are shown on Map 7.

The two most interesting features of the Pb results are the high stream sediment values obtained in Jones Creek and creeks flowing into and out of, Lake Johnstone, and the zone of high soil values west of Jones Creek, referred as zone A on Map 7. Values up to 1000 p.p.m. make this zone interesting and it should be followed up with more detail work.

5.1.3 Zn Anomalies: Refer to Map 8.
Zinc anomalies as with Pb, and for the same reasons as Pb, are also reasonably prolific.

However, the only zones considered important at this stage are shown on Map.8.

Again some stream sediment samples on Jones Creek are anomalous.

5.1.4 Ni Anomalies: Refer to Map 6.

Anomalous Ni values were obtained adjacent to two ultrabasic bodies.

Values up to 600 p.p.m on lines 4 to 8 were obtained adjacent to an ultra basic and basic complex on the south-west. These values are not high for an ultrabasic, however the area should still be regarded as anomalous (Access is very easy). Magnetics associated with the ultrabasic are high (due to magnetite). There are I.P. anomalies also associated with this body (probably due to magnetite also). A comprehensive summary of relevent information on this area is presented on Fig 2.

No Ni sluphides have been seen to date but a full geological survey has not yet been completed, however the high Cu:Ni ratio together with the serpentinization of the original gabbroic body suggest this area warrants further work.

Two rock samples and one soil sample were collected in the Henty River gorge adjacent to a small ultrabasic intrusive and gave Ni readings up to 2700 p.p.m. (0.27%) with a 7:1 Ni:Cu ratio.

A report on the rock samples is appended (Appendix I) The soil was lateritic.

This area is perhaps one of the most interesting at Mt. Tyndall and should be followed up in some detail. Access is extremely difficult.

5.2 Detailed Surveys

Several anomalies located by reconnaissance soil sampling programmes during the 1967/68 season were sampled in some detail during the 1968/69 season. However, some reconnaissance anomalies were not sampled in detail, due to the lack of manpower.

Detailed sampling involved sampling every 100' along the traverse lines over the anomalies and also sampling every 100' on lines 200' to the North and South of the anomalous area.

The results obtained from the detailed surveys which are considered significant are shown on Fig. 3 and are discussed briefly below.

5.2.1 Line 10 Anomaly: A strong reconnaissance anomaly which does not appear as strong after detailed sampling. Detailed I.P. has also been carried out here (100' electrode spacings) with no encouraging results. The detailed geochemical results do not appear significant enough to warrant extra work.

5.2.2 Lines 18 and 26 Anomalies: Strong copper anomalies by background standards at Tyndall. They occur in an area of shales, sandstones and schistose volcanics near the Henty River. Other high copper values have also been obtained on the Henty ends of Line 22 and on the Henty between 28 and 30 (Western Grid). So in general, it could be said that there are high copper values extending from Line 28 to 30 on the Henty slopes on the Western Grid. This is also the location of the unexplained magnetic anomaly B.

The ultrabasic with surrounding high Ni content rocks occurs between lines 28 and 30 and the full extent of this ultrabasic has not as yet been ascertained. Considerable amounts of chalcopyrite as well as abundant pyrite have been noted in the tuff-shale sequence between lines 18 and 28. These above facts together suggest that this zone, now called the Henty Anomaly, should be studied in more detail.

5.2.3 Howard's Anomaly: In addition to the above detailed soil sampling, a limited amount of detailed work was completed over Howard's Anomaly. The results are presented on Map 10.

Four trenches were bulldozed in order to improve the sampling effectiveness. Trenches A, B and C are shown on Map 10 but trench D is further to the South on line 16.

Trench A was dug in order to evaluate I.P. and geochemical anomalies in this area. It was chip and soil sampled every 50' and several strong, anomalous values were obtained (Cu to 600 p.p.m., Pb to 950 p.p.m. and Zn to 1500 p.p.m.) The trench cut through siliceous, sheared volcanics (agglomerates in part), often pyritic (up to 8%) and with minor chalcopyrite, galena and sphalerite. A ferruginous gossan was exposed towards the western end of the trench.

Trench B on line 22 was dug to test an I.P. anomaly here. Apart from some minor pyrite, and thick clay, nothing was unearthed to explain the anomaly. The trench cut through haematitic and chloritic finely laminated tuffs, and some more massive siliceous volcanics.

Trench C is being dug in an effort to evaluate an I.P. and Magnetic anomaly in this area of no outcrop.

It is adjacent to the main road which passes along the crest of a lateral moraine in this area. The magnetic anomaly lies immediately to the East of the road and the I.P. anomaly immediately to the West of the road. It is virtually impossible to trench the I.P. anomaly which lies both under the moraine and under a swamp. There is good evidence for believing this anomaly is caused by a pyritic shale bed, namely the fact that it is in a topographically depressed zone, and it is in direct strike line with a shale bed exposed in a drill access road just to the south. However, it was felt that by trenching to the east of the road, some evaluation of the magnetic anomaly could be made and any exposure could also assist in explaining the I.P. anomaly more fully. This trenching is at present in progress and has exposed some bedrock.

Trench D on line 16 is presently being dug in an area of no outcrop to evaluate the strongest I.P. anomaly so far located at Tyndall. Some exposure has to date been achieved and trenching here is continuing.

In addition to these trenches, a restricted programme of soil sampling was completed on the traverse lines. Some very encouraging results were obtained (Refer to Map 10) and more detailed soil sampling is recommended in this area as shown on Map 10. Good access is provided by roads and timber tracks into Howard's Anomaly and these should allow a meaningful and well controlled sampling programme to be completed here prior to the drilling recommended later in this report.

6. GEOPHYSICS

Geophysical work on the lease consisted of electromagnetic and magnetic ground surveys.

6.1 Electromagnetic Surveys:

A McPhar V.H.E.M. unit was used, employing a vertical loop coil configuration and using the "in-line" method of survey, whereby the transmitter and receiver units operate along the same traverse line. Maximum coil separation was 400' giving approximately 130' to 160' depth penetration under ideal conditions. Readings were taken every 100'. Where overburden was thick of clayey, or where topography was rugged, depth penetration was probably considerably less than 130'. The McPhar unit was used because of its high portability.

There were many difficulties incurred during the survey, namely coil orientation, and the low power of the instrument, and low quality operators. Coil orientation is probably the most serious problem with this particular instrument and x very difficult one to overcome in rugged terrain where traverse lines are usually crooked and visual transmitter - receiver contact is impossible. The best remedy with a V.H.E.M. is commonsense. Orientation problems would probably not be as serious with Sharpe Instruments, but they in turn, have other disadvantages (e.g.) lower portability.

Dip-angles (Angles of Distortion of primary field) are plotted on 500' plans and sections but only obviously anomalous zones are shown on Map 4, along side I.P. anomalies located during former seasons.

The E.M. survey is only partially completed, due entirely to lack of manpower of suitable calibre. Coverage is shown on Map 4. The anomalies obtained cannot be fully assessed until further geophysical, geochemical and geological work is undertaken over them. Therefore no assessments are offered in this report.

6.2 Magnetic Surveys

These surveys were completed using a Sharpe magnetometer. Readings were taken every 100' on the main traverse lines.

In areas of interest, this reading interval was reduced to 50' or 25'. Readings have been plotted on 500' plans and sections but anomalous areas only are shown on Map 5 in this report. Background is approximately 400 - 500 gammas.

Again the coverage has been incomplete because of the lack of suitable manpower and lengthy instrument breakdowns. The coverage is also shown on Map 5.

Several good anomalies have been outlined and these are discussed below. There weremany small (area and magnitude) anomalies and these could possibly be due to the inexcusable use of steel toe-capped boots for most of the field season. (Mt. Lyell could provide no others)

6.2.1 Anomaly A: A strong anomaly (up to 34,000 gammas) over a seggregated serpentinite body within a gabbroic instrusive. The gabbro itself is not magnetically anomalous but during serpentinization, the pyroxenes in the gabbro broke down into serpentine (bronzite?) and disseminated magnetite. This is discussed more fully in the geological section of this report.

6.2.2 Anomaly B: is a large, irregular high zone along the Western slopes of the Henty River between lines 14 and 24 at least, and possibly further to the North and South.

Generally, values are only two to three times background. Associated with this high zone, is a low zone along the Henty River itself, generally one times background below background. To date, apart from the ultrabasic body near line 28, there has been nothing to explain this anomaly. It may be a terrain effect on these steep slopes. (All these lines were done with the operator wearing steel toe capped boots).

6.2.3 Anomaly C - a very strong diffuse anomaly with no apparent cause. The results are shown on Map 9, and from this map it is obvious that a detailed evaluation of the anomaly is necessary. Rio Tinto did not obtain such an extensive anomaly as this, so the possibility of an instrument fault should not be overlooked. (This magnetic survey was completed by the author).

6.3 Assessment of Geophysical (I.P) Anomalies outlined during 1967/68 season.

Refer to Map 4. All reconnaissance and detailed I.P. anomalies located by McPhar Geophysics are outlined on this map and their origins are discussed below.

6.3.1 Anomaly I: Magnetite in the serpentinite body outcropping here.

6.3.2 Anomaly II:and III: Not evaluated as yet - possibly pyritic shales.

6.3.3 Anomalies IV, V, VI, VII: Probably are all caused by pyritic shales interbedded with volcanics. The dark black shales are well exposed on roads in the area and there has been little reason, geochemically or geologically to place much importance on these anomalies.

6.3.4 Anomaly A: Not evaluated yet and trenching will be required and is recommended.

6.3.5 Anomaly B: Off the lease.

6.3.6 Anomaly C1: Drilled on line 12 and located pyritic shales which probably produced the anomaly.

6.3.7 Anomaly C2: As yet unexplained due to poor outcrop. Trenching over this anomaly is presently in progress.

6.3.8 Anomaly C3: This zone has been discussed in some detail in section 5.2.3 and it falls within "Howard's Anomaly. The geophysical anomalies are shown in detail on Map.9.

6.3.9 Anomaly C4: The southern part of this anomaly is probably resulting from pyritic chloritic and feldspathic schists in the area. There is also minor chalcopyrite, marinatite and galena in these schists.

The outcrop is either very poor or non-existant in the northern section of this anomaly.

6.3.10 Anomalies D and E: Pyritic shales.

7. RECOMMENDATIONS FOR 1969/70 FIELD SEASON

Detailed recommendations have been discussed at length with Messrs. Shakesby and Reid and the following is a summary of these discussions. There is a lot of obvious work to be done at Tyndall this coming season and in order that it be done effecitvely, the recommendations are categorized into three priority groups. The effective completion of all recommendations also depend upon the staffing recommendations being acceptable.

7.1 First priority

The following work is obviously desirable early in the coming season.

7.1.1 Red Hills: A great deal of work has already been completed in this area by Rio Tinto, and the E.Z. Coy. of Rosebery, including I.P., E.M., (Turam) magnetomater surveys, and at least three drill holes in the Red Hills area and two in the Gooseneck area. An early reinterpretation and evaluation of their work seems necessary. This may or may not lead to early drilling in this area. Further geochemical and geophysical work will depend upon E.Z.'s surveys and therefore no programmes are recommended here at this stage.

It is likely that further grids will have to be laid in this area, preferably at 800' line spacings.

= 7.1.2 Lake Dora to Lake Selina: This is a large belt of Cambrian schists, mineralised in part (Dora and Selina) and largely covered by glacials and lakes. Tall vegetation is restricted to a few gullies and hill sides. Because of its glacial cover, this area has not been well prospected to date and is considered a prime target. Access is relatively good. An 800' grid (true N-S) will have to be laid and a rough track pushed along this base line for Haflingers.

Geochemical and geological surveys will be fairly limited due to poor outcrop. Therefore the main emphasis should be placed on E.M. - I.P.-Magnetic surveys.

7.1.3 Howard's Anomaly The work completed on this area to date suggests this is a very promising area which could be developed into an early drilling target.

The following work is recommended. The detailed geochemical sampling programme should be completed in the area shown on Map 10, making full use of roads and tracks in the area as well as traverse lines. The area should be mapped in detail. Outcrop is generally good. Some attempt to establish a similarity between this area and Comstock could prove profitable. The existing detailed I.P. coverage should be extended to the east. Retesting the magnetic survey (in part only), followed by an attempt to explain the anomalies is also recommended.

Access into this area is good and no further track cutting is necessary.

7.1.4 Henty Ultra-basic: Due to several encouraging Ni analyses in this area last season, the following work is recommended in this area. Detailed mapping along the Henty to the north and south of the ultrabasic to determine its extent is necessary. Magnetics will probably be of considerable assistance in this direction also.

Detailed soil and chip sampling in the area on both sides of the Henty is also recommended.

This area is very rugged and interest will have to be very high to warrant such things as drilling. If it is thought necessary in the future to have a drill access road into the area from the east, it is suggested that B. Bradshaw be advised, as he is also interested in a logging track into this area.

7.2 Second priority:

Necessary work which should be completed, but not at the expense of first priority work.

7.2.1 Anthony Creek: There is known that a large belt of Cambrian volcanics lies along the lower reaches of the Anthony Creek but their full extent is not known, nor is their relative value known. The area is heavily timbered and rugged in part. It would appear at this stage that this will be an exploration target in the 1970/71 season. It is therefore recommended that some reconnaissance mapping be done in this area for the pruposes of defining the limits of the Cambrian and choosing a suitable route for an access road. A start should be made on the access road late in the coming season. The simplest way into the area appears to be from the south (Lake Selina area). Considerable track cutting on a grid will be necessary.

7.2.2 South-West Ultra-basic: A programme of detailed soil and chip sampling around the ultra-basic for Ni is recommended. Values obtained to date have not been too encouraging but samples were only taken at random. Track cutting in the initial stages of sampling won't be necessary. If further geophysics is necessary it should be I.P. on 100' electrode spacing as E.M. is virtually useless over an ultra-basic of this nature.

7.2.3 Completion of reconnaissance surveys: Several reconnaissance surveys commenced during the 1968/69 season were not completed due to a lack of suitable manpower, viz E.M. and magnetometer surveys. These areas can be seen clearly on Maps 4 and 5.

7.3 Third priority

These are areas to be studied only if time and manpower permit.

7.3.1 Geochemical and geophysical anomalies located during the reconnaissance surveys of last season require more detailed work. These are scattered in a random manner over both the western and eastern grids, and should be treated on their relative merits.

7.4 Geophysical Surveys

The majority of work this coming season will be completed between Lake Dora and Red Hills. This is open country in the main and so a different geophysical approach is recommended to that used on the Tyndall Lease in the past.

7.4.1 Grid Lines: True East-West grid lines (70° - 258° magnetic), spaced at 800' intervals, pegged every 100', marked with yellow ribbon and perma-tags are recommended. This will allow the most economical I.P. and magnetometer surveys to be carried out (in terms of actual coverage per line mile), and the most effective E.M. survey (Broadside).

7.4.2 E.M. Surveys: Initally a vertical loop survey is recommended (tilt-angle method) using a broadside orientation. This will outline general areas of interest (with respect to conductance). A Sharpe S.E. 300 is suggested as the most suitable instrument for this purpose as it can be satisfactorily used on 800' line spacings using the broadside method. Readings every 100' (initially) would probably be sufficient.

Follow-up detailed E.M. can be done on closer line spacings using both the S.E. 300 for the set-up method and the McPhar V.H.E.M. for horizontal loop detailing.

7.4.3 <u>I.P. Surveys</u>: I.P. should be used as extensively as financially possible. Any large deposit at Tyndall will probably be essentially disseminated. The estimated relative costs per line mile are: I.P. - $200.00, E.M. - $40.00, Magnetics - $10.00; a total for a combined survey of at least $250.00 per line mile. It is estimated that there will be approximately 40 line miles to be covered this year.

7.5 <u>Access</u>:

It is proposed this season to reduce access costs (as per Fig I) so that more money can be put into "pure" exploration, such as geophysics and drilling. The means of accomplishing this are outlined below:

7.5.1 <u>Road Construction</u>: Due to the open nature of most of the country in the east of the lease, it is recommended that Haflinger vehicles be used on very low cost tracks. The only major road proposed is to the Lake Rolleston camp site, with a main track along the grid base line.

7.5.2 <u>Track Cutting</u>: Again the open nature of the country should all but eliminate the track cutter. Line pegging as outlined in 7.4.1 can be done by field assistants.

7.6 Camps

Well equipped camps are recommended at the Henty River on the Eastern road and about 1 mile north of Lake Rolleston on Anthony Creek. The Henty River camp is already nearing completion.

7.7 Staff

The following staff would be necessary for the successful and competant completion of the above recommendations

Geologists:	3
Field Assistants:	6
General Bush Hand:	1 (Papworth)

The geologists and assistants should be drawn both from Renison Ltd., and Mt. Lyell, thus relieving the strain on either one.

It is also strongly recommended that general administration and supervision be taken from Mt. Lyell and given to Renison, as Renison are in a far better position staff wise to handle it.

8. BUDGET

To complete the above recommendations satisfactorily, the following budget is recommended. It has the initial approval of Messrs. Shakesby and Reid.

8.1	Salaries	$20,000
8.2	Consultant (Geophysicist)	$ 4,000
8.3	Geochemistry (Analyses only)	$ 2,800
8.4	Geophysics (I.P., E.M., Magnetics)	$12,000
8.5	Roads (Access and maintenance)	$20,000
8.6	Trenching	$ 2,000
8.7	Track Cutting (Wages)	$ 2,000
8.8	Camp Costs (Construction, Food etc.)	$ 4,000
8.9	Equipment	$ 1,000
8.10	Vehicle hire	$ 3,000
8.11	Drilling	$20,000
8.12	Contingencies	$10,000
	TOTAL	$100,000

8.13 <u>Notes</u>

8.13.1 The 55% overhead on salaries seems out of all proportion and it is hoped that this percentage can be reduced drastically to obtain more for value on 8.1

8.13.2 The geophysics figure of $12,000.00 would allow approximately 40 operating days of combined I.P.-E.M.-Magnetometer survey.

8.13.3 Properly supervised, $2,000.00 worth of trenching in open country means about 15 or 20 trenches,

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each a few hundred feet long.

8.13.4 If track cutters are necessary from time to time, it is recommended that the gang from Lake Margaret be used.

8.13.5 The campsat present under construction are semi-permanent and so future camp costs should decrease.

8.13.6 Four or five drill holes should be obtained for $20,000 with some aid probably coming from the $10,000 contingencies estimate (8.12)

9. ACKNOWLEDGEMENTS

The writer wishes to thank Messrs. Reid (Mt. Lyell) and Shakesby (Renison) for the assistant and advice frequently given on matters pertaining both directly and indirectly to activities on Mt. Tyndall Lease.

Thanks also to te R. Wilson of Mt. Lyell for his assistance in drafting plans.

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10.8 General references

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APPENDIX 1

Mineralogical and Petrological Report from W. Fander of the Central Mineralogical Service.

Sample: Hand Specimen from Henty River near ultra-basic.

Identification: Schistose, cherty carbonate meta-sediment containing millerite.

Hand Specimen: Streaky pale rock with greenish layers; ultra fine sulphides present.

Microscopic: The rock consists of layers and lenses of carbonate, alternating with microcrystalline quartz. Patches of apple-green, hydrated nickel silicate with fibrous to micaceous habit, occur between the quartz grains in some layers. Euhedral opaques (some of them prismatic) are also present. The rock is a re-crystallised cherty carbonate, with a certain degree of schistosity, and could be termed a metasediment. The sulphides are epigenetic.

In polished section, there are many very small crystals of pyrite (maximum size of aggregates = 0.3 mm) and very small prismatic crystals of millerite (NiS), up to 0.10 mm long.

Remarks: The millerite probably accounts for the bulk of the Ni analysis. Occasional fine blebs of chalcopyrite are responsible for the Cu analysis.

APPENDIX II

DIAMOND DRILL HOLE T1

Diamond drill hole T1 was collared (11th June, 1968) at 2650 feet east on Line 12 (at an inclination of -40° to the west) in order to test the source of the "strong" I.P. anomaly and adjacent geochemical anomaly (Cu, Pb, Zn). The drilling was carried out by Associated Diamond Drillers using Bx wireline down to 399 feet and subsequently due to the low angle of inclination, conventional Bx rods down to the end of the hole at 734 feet.

No significant mineralisation was encountered and only minor scattered blebs of chalcopyrite, sphalerite and pyrrhotite were observed. Sparsely disseminated pyrite was observed throughout the core with local concentrations of up to approximately 5 percent in the dark grey-black shales and siltstones. The total sulphide content, particularly of the shale - siltstone - sandstone sequence, appears to be sufficient to account for the I.P. anomaly (Fig. 5) A reconnaissance ground magnetometer survey along line 12 revealed a moderate - strong magnetic anomaly, centred approximately 200' beyond the end of the drill hole and dipping steeply to the east. L.A. Newnham has questioned the accurracy of this magnetometer survey and further work should be conducted to check the authenticity of the anomaly and subsequently to outline it in greater detail.

The hole was abandoned on the 4th September, 1968 but approximately 100 feet of casing was left in the hole to permit further drilling if necessary. The detailed core log of the hole is appended.

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THE MOUNT LYELL MINING AND [cut off]
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DIAMOND DRI[cut off]

Hole Number	T1.								
Location	Line 12, 2650'E of Mt. Tyndall access road on the eastern side of the Henty river.								
Level									
Co-ordinates	2650' East on line 12 East Tyndall								
Collar R.L.									
Length	734'								
Survey Depth	00'								
Bearing	270°								
Inclination	40°								
Rod Size	0-399' Bx wire line 399-734' Bx.								
Machine									
[Lo]gged by	L.A. Newnham.								
30' Plans									
30' Sections									
100' Plans									
100' Sections									

Purpose

2300'E.

Comments

Commenced

Completed

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DIAMOND DRI

T 1

FOOTAGE From	FOOTAGE To	RECOVERY Ft.	RECOVERY %
0	95	0	
	96	1	
	98	0	
	102	4	
	109	7	
	115	6	
	125	9	
	135	10	
	144	9	
	149	5	
	155	6	
	165	10	
	175	10	

DESCRIPTION

Gravel and fine sand.
0 - 25 Gravel derived from glacial boulders.

25 - 95 Very fine unconsolidated sand.

95 - 96 Coarse, dirty white-grey silicous-volcanic with dark carbonaceous (?) blebs and fragments

96 - 104 Light grey; banded felspathic sandstone; Pyrite films on fracture planes. Banding (bedding) 70-80° to C.A.
Fractures 40-50° to C.A.
Coarser bands at 101'6" to 104'
(ie) Coarser towards base.

104' - 175'6" Sequence of coarse seds. and granitic type of rock.
Contact with above sandstones is fairly sharp but conformable.
Sedimentary bands are coarse, arkosic, fragmental in part (mainly shaley)
Composed mainly of kaolinized felspar and quartz in a finer (but minor) dark green-grey (chloritic) grdmass.
Granitic rock is lighter, but coarse, sub-equigrained and composed mainly of quartz + feldspar.
Appears agglomeratic in places with irregular, angular fragments common.
Dark bands usually at 60-70° to lighter granitic and agglomeratic material.
Minor pyrite less than 1% in places as fine discrete, sometimes crystalline grains; also as small finely disseminated blebs. (at 125')
Few chalcopyrite grains at 141½'
also fine blebs of finely dissem. sphalerite.
No bedding visible in granitic material.
2" quartz vein iron stained at 109'4" - 6"
Sequence very coarse, agglomeratic, in last 2' with angular fragments up

DIAMOND

T 1

FOOTAGE From	FOOTAGE To	RECOVERY Ft.	RECOVERY %	DESCRIPTION	AS From	AS To	AS Ft.	AS %
				to 1.5" 175'6" - 224'				
175	178	3						
	182	4		The shale Contact with above sequence				
	190	5		sharp but probably conformable.				
	203	8		Shale generally dark - grey to black				
	209	6		with lighter sandy and silty beds.				
	220	11		Bedding variable. Several clearage directions. Pyrite on bedding and clearage surfaces. 175 to 224 Dark shale with bedding generally 50-60° to C.A. with minor variations Major clearage is parallel to the bedding with minor clearage almost parallel to C.A. Pyritic throughout 1% (approx) Lighter, more siliceous, slightly coarser tuff (?), Banded in places (eg) 207' - 207'6", 214', 217 - 218'6" Honeycombed quartz veining 204 - 205' 224 - 237				
	230	10		Bedding almost parallel to C.A. Minor faulting and clearage about 45° to C.A. Small slump, flame and anticlinal structures shower by lighter bands. Pyritic throughout mainly on clearage planes 1% - 2% 237 - 242'				
	238	8		Bedding steepens but is still variable and contorted in part. 242 - 256'6" Coarser, fragmental in part volcs. Appears somewhat similar to "upper" volcanic - sediment beds. with a few coarse, dark sedimentary bands. These bands, together with the clearage developed, are generally slickensided. Basal few feet are very coarse, agglomerate (?) Pyritic throughout less than 1% either on clearages or dissm. grains and blebs.				

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DIAMOND DR

T 1

FOOTAGE From	FOOTAGE To	RECOVERY Ft.	RECOVERY %	DESCRIPTION	ASSAYS From	To	Ft.	% Cu.	% FeS
238	249 260	10 11		<u>256'6" - 267'</u> Shales with minor silty bands. Shales are black to dark grey; bedding variable. 256'6" - 265' bedding steep, 60-70° to C.A. near base but steppening 70 -80° to C.A. Cleavage less than bedding. 40 - 50°. Coarse band similar to unit above from 261 - 262' Cleavage in this band at 60° / C.A. (approx) 265 bedding very shallow, and is wavy, "anticlinal" at 266'6" begins to steepen 269' up to 30°/C.A. Pyritic 1% especially on cleavage surfaces.					
	270 282	10 9		<u>267 - 282</u> Dark grey, fine grained, well bedded, soft shaly material. Bedding / C.A. 30° (approx) 2 cleavages, one parallel to bedding, one perpendicular to bedding. Pyrite 1-2% on bedding and cleavage faces as films and finely dissem. euhedral grains. Minor quartz. veins at 270' After 274', becomes more siliceous lighter grey at 278', has appearance of medium grained quartzite. Finely dissem. pyrite 2-3% (possibly some pyrrhotite). Becomes more dolomitic(?) after 80' but essentially same as above. Bedding 20 - 30° / C.A.					
	294	11		<u>282 - 303'</u> Light, coarse grained, almost fragmental siliceous rock, composed mainly of quartz grains set in softer darker dolomitic- shaly groundmass. Fragmental texture very pronounced					

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THE MOUNT LYELL MINING A[…] LIMITED

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DIAMOND DRI[…]

T 1

FOOTAGE From	FOOTAGE To	RECOVERY Ft.	RECOVERY %
282	307	13	
	318	8	
	326	6	
	336	11	
	352	16	

DESCRIPTION

after 284'.

Angular shaly fragments up to 1" suggesting agglomerate.
Massive but vague bedding produced by thin shale "stringers".

Sulphide 1% Mainly pyrite,

Major clearage 30 - 40% C.A. but fracture irregular.

The rock is similar to that on the surface at 2200' on line 12.

303 - 353'

Medium - dark grey, fine grained cherty, bedded (banded) quartzite.

Similar to rock in interval 267 - 282'.

Gradational contact with unit above. Bedding to 314'6" 30°/ C.A. (approx) 314'6" 334' Bedding flattens and is approx. Parallel to C.A. with sandy bands promminent from 314'6" 317'6".

Considerable core loss from 309'6"- 314'6".

Heavily quartz - veined slightly 334' to about 20' but flattens at 335' to 336'

Clearage variable.

Bedding 30° / C.A. at 340'

45-50°/C.A. at 344'

60-70° at 347'

70-80° at 353'

Rock cherty to 344' then becomes

ASSAYS

From	To	Ft.	% Cu.	% S
300	305	5	<0·01	0·14
	310	5	<0·01	0·30
	315	5	<0·01	0·99
	320	5	0·01	1·35
	325	5	<0·01	0·65
	330	5	<0·01	1·14
	335	5	<0·01	0·38
	340	5	<0·01	0·22

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DIAMOND DRI

T 1

FOOTAGE From	FOOTAGE To	RECOVERY Ft.	RECOVERY %	DESCRIPTION	ASSAYS From	ASSAYS To	ASSAYS Ft.	% Cu.	% [illegible]
				more banded and dolomitic (?) with light grey coarser and more fragmental bands alternating with darker softer bands. Sulphide (mainly pyrite) 2-3% but up to 5% in places. Mainly sub-euhedral, finely dissem.					
352	362	10		<u>353 - 373½</u> Light grey, fragmental, agglomeratic rock. Fine grey, siliceous grdmass with generally small fragments (angular) of chert, lithics, and shaley material.Groundmass is feld-spathic (kaolinitic) in part. Coarse, generally thin, arkosic bands in part. Pyrite 1-2%. Generally as films and finely dissem. blebs an cleavage and fracture surfaces. Similar to rock out cropping on the surfaces at 2200ft. and agglomerates (above). The rock becomes more siliceous 369-370 and 371 - 372 with free quartz veining.					
	374	12		<u>373½ - 379½</u> Medium to dark grey fine grained, silicous, bedded "sandstone (?) Large fragments of quartzite material in the bottom few feet. Bedding 50-60°/C.A. Pyrite 2-3% after 375' Becomes darker and softer (domomitic) over east few feet.					
	384	10		<u>379½-388½</u>	340	385	NOT	ASSAYED	
				Grades into a sandier material which gradually becomes coarser: Greywacke appearance at 386; very coarse, almost fragmental at 388' but is generally massive throughout. Sulphide less than 1% in shaley rock at 388½' Composed mainly of quartz with small, darker shaley fragments common.	385	390	5	<0.01	0.18
						395	5	<0.01	0.94
						400	5	<0.01	1.42
						405	5	<0.01	0.87
						410	5	0.01	0.54
						414	4	<0.01	0.25
						422	7	<0.01	0.26
				<u>388½-422'</u> Fine grey, siliceous bedded shale-					

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THE MOUNT LYELL MINING AND
LIMITED

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DIAMOND DRILL

T 1

FOOTAGE From	FOOTAGE To	RECOVERY Ft.	RECOVERY %	DESCRIPTION	ASSAYS From	ASSAYS To	ASSAYS Ft.	% Cu.	% S.	Oz. Au.
384	399	14		quartzite sequence, dolomitic in						
	408	8		places Bedding 45°/C.A.						
	417	9		Pyrite 1-2% Finely disseminated.						
				Darker and more carbonaceous at						
				399'						
				Coarser Sandier beds have up to						
				5% (390') of pyrrhotite - fine						
				chalco(?)						
				Bedding 45° at 405'						
				30° at 408'						
				45° at 415'						
				Becomes sandier with stronger quartz						
				calcite veining after 412'						
				414 - 415' Coarse vein of quartz						
				calcite with pyrite, possible some						
				pyrrhotite and minor chalcopyrite						
				up to 2%						
				Remains coarse and sandy to 422'						
	426	9		<u>422 - 514</u>	514	520	6	<0.01	1.04	
	436	10				525	5	<0.01	0.96	
	446	10		Well bedded, dark grey-black shaly		530	5	"	0.59	
	458	12		sequence with minor beds of light		535	5	"	0.49	
	468	10		grey, medium grained sandy material		540	5	"	1.14	
	476	8		Minor quartz and calcite veining,		545	5	"	0.61	
	483	6		generally on bedding planes but		550	5	"	0.34	
	495	12		occasionally across planes as 447'		555	5	"	1.60	
	505	10		Some minor finely agglomeratic(?)		560	5	"	1.23	
				or very immature intervals at 429'		565	5	"	1.22	
				and 440'		570	5	"	1.70	
				Bedding; 75° at 428'		575	5	"	1.02	
				70° at 434'						
				60 at 446'						
				55 - 60 at 450'						
				Facing difficult to discern . but						
				possible younging down hole.						
				Pyrite 2% as films and fine						
				disseminations on bedding planes.						
				Coarser in quartz - calcite veins.						
				Possible some chalcopyrite in						
				sandier (ie) coarser bands.						
				Heavy quartz - siderite veining						
				between 4608- 468'						
				Shale becomes graphitic in places.						
				454' - 460' is sandier than usual.						
				Bedding at 458' is 20° over short						
				interval; 60° at 480'						
				Minor quartz - calcite veins per-						
				sisting at 580' and containing some						

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THE MOUNT LYELL MININ[G]
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DIAMOND D[RILL ...]

T 1

FOOTAGE From	FOOTAGE To	RECOVERY Ft.	RECOVERY %	DESCRIPTION	ASSAY From	To	Ft.	% Cu.
				minor chalcopyrite (?) Bedding at 458' suggests that beds on facing theeight way up. Coarse light grey, fragmental band 495 - 496'6" Shaly sequence contains to 514', However over the last 30' of the sequence, the sandy component gradually increases. Bedding at 511' = 60°/C.A.				
505	515 528	10 13		<u>514 - 532</u> Medium- coarse grained tuffaceous rock with fine light grey grdmass. Fragments and thin beds of chert and shale. Sharp but conformable contact with unit above. Still a fair proportion of shaly and sandy material in this interval and it was probably transition beds between shales and sandstones above, and agglomerates and andesites below. Bedding /C.A. at 530 60° (approx)				
				<u>532 - 534</u> Commencement of the volcanic-intervise sequence.				
	535 545	7 10		<u>534 - 548'</u> Coarse, mottled dark to medium grained fragmental, probably agglomerate. Very minor sandy beds in places Fragments usually less than 0.5% and varying from dark grey-black to pink and white quartz grains. 540 Light medium grained igneous rock, med grained consisting mainly of quartz and feldspar. Some coarse and fine (shaly) bands still present at 544' Pyrite and Pyrrhotite 4% as dissem. grains and small blebs. Possibly minor chalcopyrite.				

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THE MOUNT LYELL MINING [...] LIMIT[...]

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DIAMOND D[...]

T 1

FOOTAGE From	FOOTAGE To	RECOVERY Ft.	RECOVERY %
545	552	7	
	562	10	
	572	10	
	582	10	
	598	16	
	608	10	
	618	10	
	627	9	
	635	12	
	645	10	
	663	18	
	681	18	
	697	16	
	707	10	
	717	10	
	727	10	
	734	7	

DESCRIPTION

548 - 558'

White feldspars become more conspicuous and rock is similar to andesite. Dark fine grained quartz-feldspar grdmass with numerous white phenocrysts of feldspar $\frac{1}{4}$" long, giving the rock a speckled appearance.
5-6% sulphides; Pyrite, pyrrhotite some of which maybe bornite-chalco.(?) Occurs as blebs, and widely dissem.

558 - 630'

Basically same as above but brecciated. Large fragments of the andesite occur in lighter finer grained groundmass. Fragment sizes vary up to several inches.
Could be vent breccia (?)
Sulphides at above continue (to 5%.)
Brecciated zone continues to 600', then an interval (few ft.) of unbrecciated rock and then brecciated again.
Gradual decrease in sulphides after 575' but still dissem. up to. 2% Pyrite, pyrrhotite and minor chalco.
Minor quartz veins and calcite veins with some free calcite in andesite material.
Major brecciation finishes at about 615' but minor brecciation of andesitic material continues to 630'

630' - 734'

Sudden appearance of hornblende phenocryts. The rock is similar to the above andesite but not brecciated, and has more quartz phenocrysts and fewer feldspars. Little or no sulphides. No noticeable orientation of hornblende phenocrysts.
Minor quartz veining at 653'
Brecciated by quartz vein 638 - 640'
Only minor pyrite patches.
Minor chloritic veining.
Increase in pink felspar laths after

ASSAYS

From	To	Ft.	% Cu.	% [...]

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THE MOUNT LYELL MINING AN[D] ... LIMITED

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DIAMOND DRI[LL]

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FOOTAGE		RECOVERY		DESCRIPTION	ASSAYS					
From	To	Ft.	%		From	To	Ft.	% Cu.	% FeS$_2$	Ozs.
				654 to 659'. Small brecciated intervals 668 - 670 and 671 - 672. Minor quartz - chlorite veining at 664'6". Still minor amounts of pink feldspar. Little sulphide, small specks of pyrite/chalco in quartz veins.						
				Hornblende - feldspar - quartz porphyry to end of hole with variations in color of groundmass from light to dark grey, and in the amount and nature of the feldspar phenocrysts. Small veins of dark pink feldspar and quartz in places. Only traces of sulphides. Small patches of a bright green mineral in places, probably serpentine.						
				END. HOLE. 734.						

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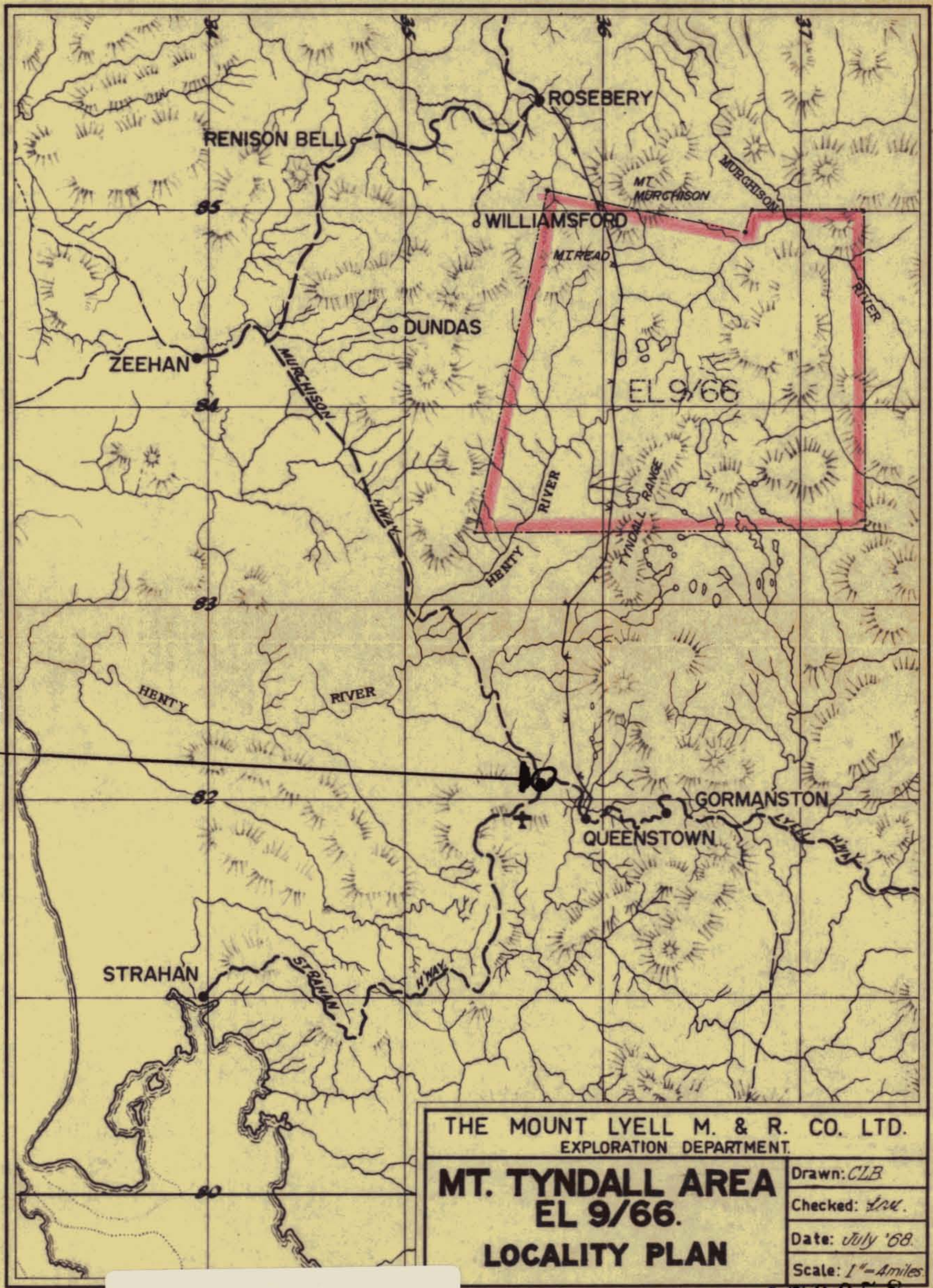

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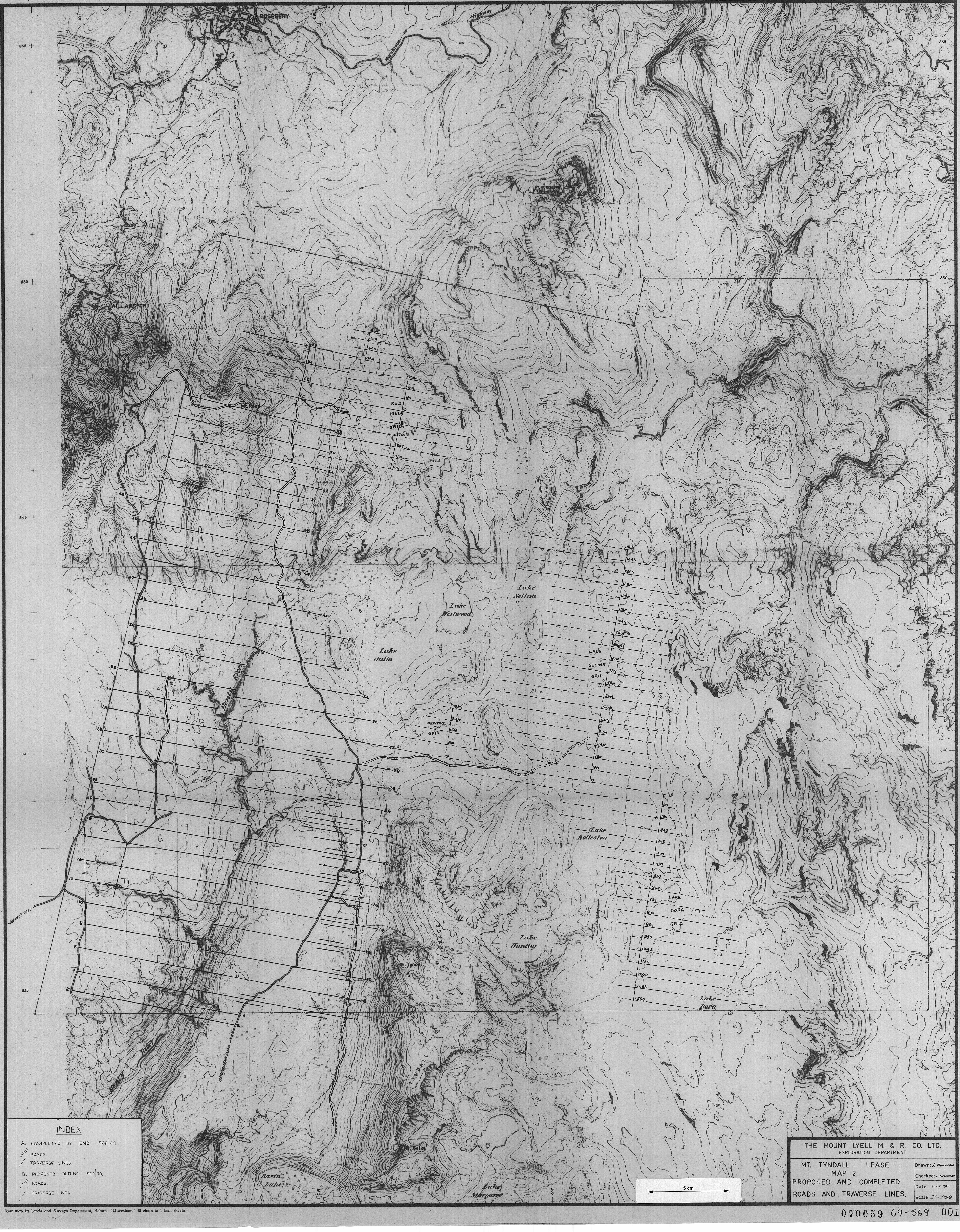
Map-1.

5 cm



Base map by Lands and Surveys Department, Hobart. "Murchison" 40 chain to 1 inch sheets

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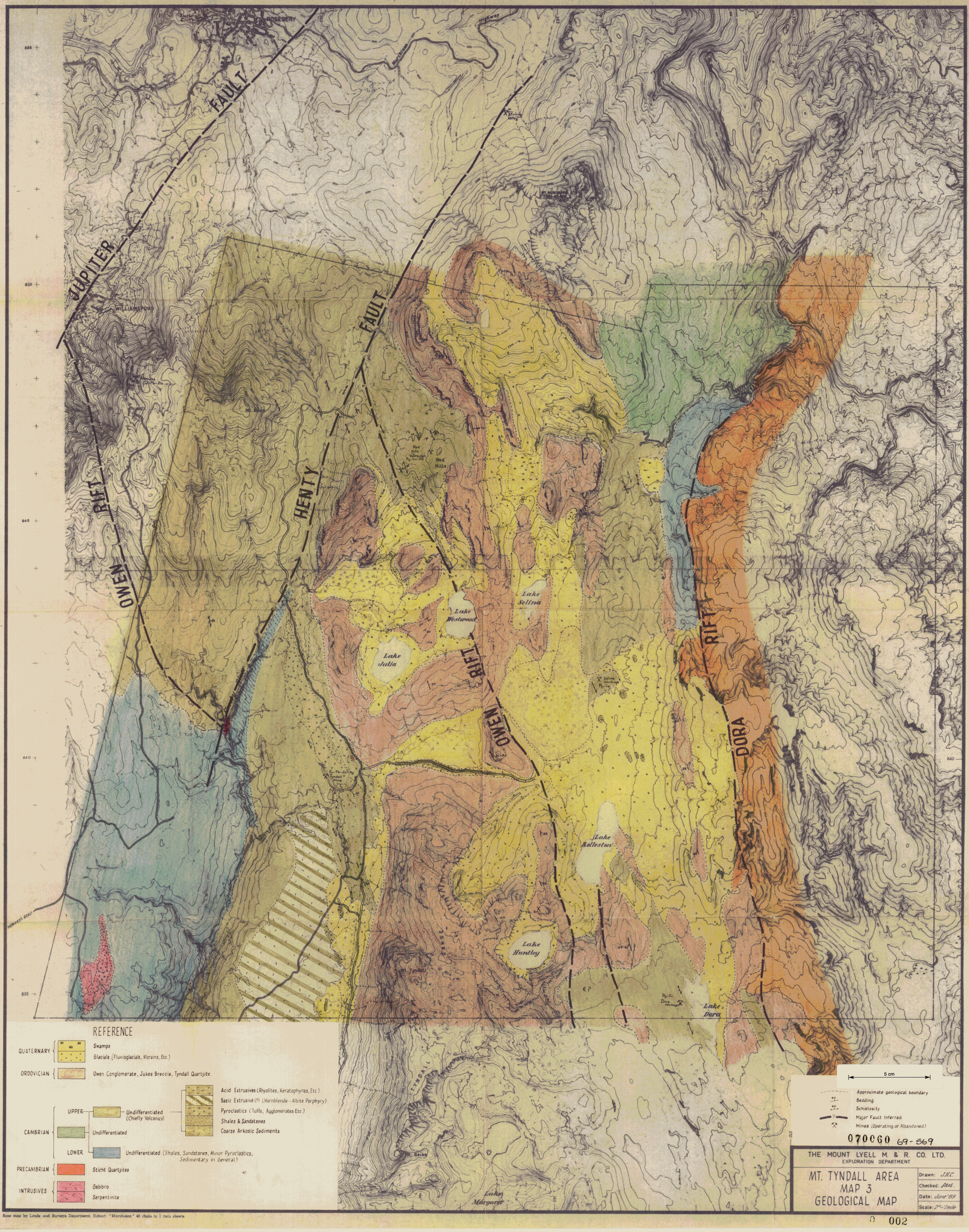
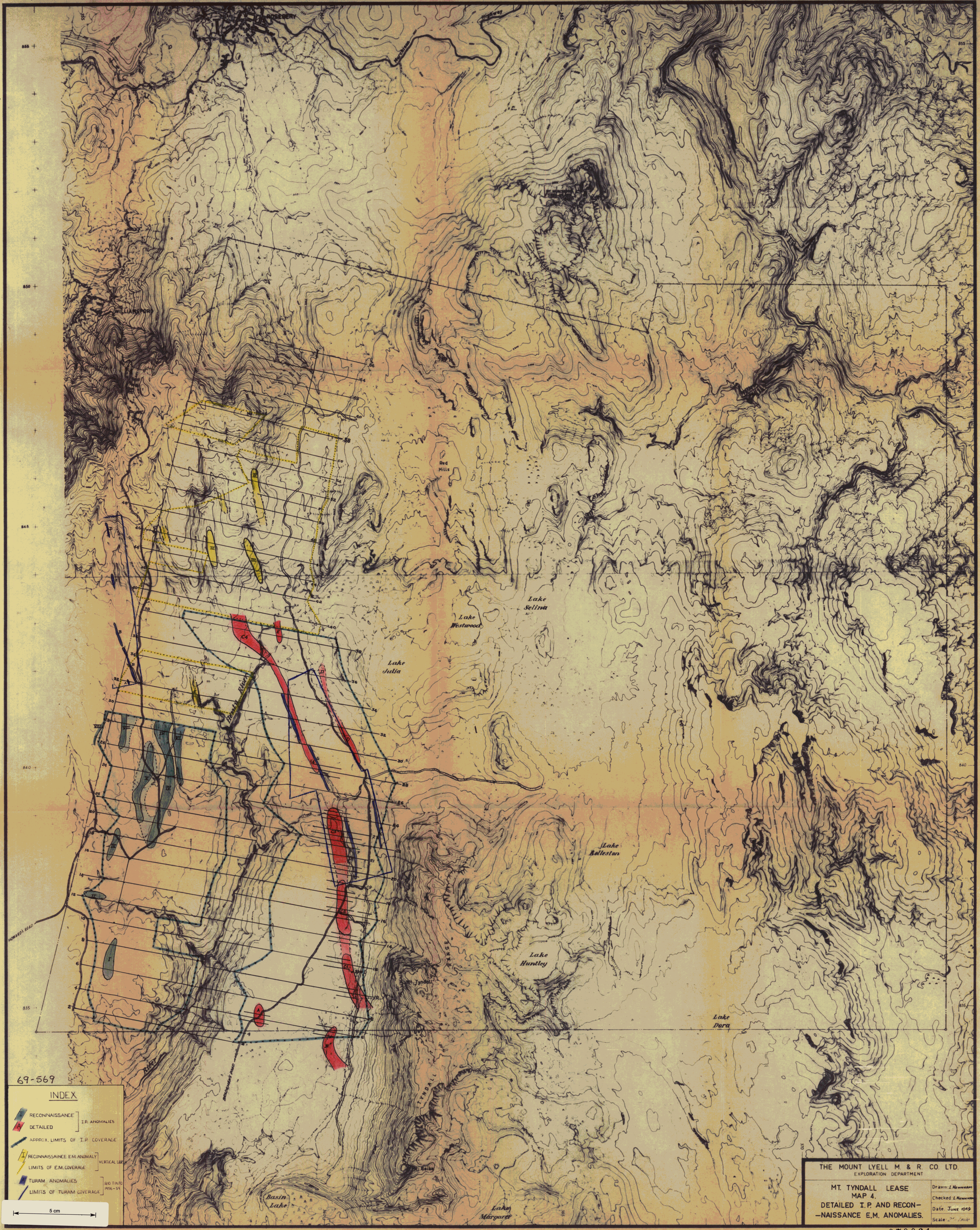


JUPITER FAULT
OWEN RIFT
HENTY FAULT
OWEN RIFT
DORA RIFT
Lake Westwood
Lake Selina
Lake Julia
Lake Rolleston
Lake Huntley
Lake Dora
Lake Margaret
REFERENCE
QUATERNARY
Swamps
Glacials (Fluvioglacials, Morains, Etc.)
ORDOVICIAN
Owen Conglomerate, Jukes Breccia, Tyndall Quartzilte.
CAMBRIAN
UPPER
Undifferentiated (Chiefly Volcanics)
Acid Extrusives (Rhyolites, Keratophyres, Etc.)
Basic Extrusive (?) (Hornblende - Albite Porphyry)
Pyroclastics (Tuffs, Agglomerates Etc.)
Shales & Sandstones
Coarse Arkosic Sediments
Undifferentiated
LOWER
Undifferentiated (Shales, Sandstones, Minor Pyroclastics, Sedimentary in General)
PRECAMBRIAN
Sticht Quartzites
INTRUSIVES
Gabbro
Serpentinite
5 cm
Approximate geological boundary
Bedding
Schistosity
Major Fault Inferred
Mines (Operating or Abandoned)
070060 69-569
THE MOUNT LYELL M. & R. CO. LTD.
EXPLORATION DEPARTMENT
MT. TYNDALL AREA
MAP 3
GEOLOGICAL MAP
Drawn: J.H.C.
Checked: Sam.
Date: June '69
Scale: 2" = 1 mile
Base map by Lands and Surveys Department, Hobart. "Murchison" 40 chain to 1 inch sheets.

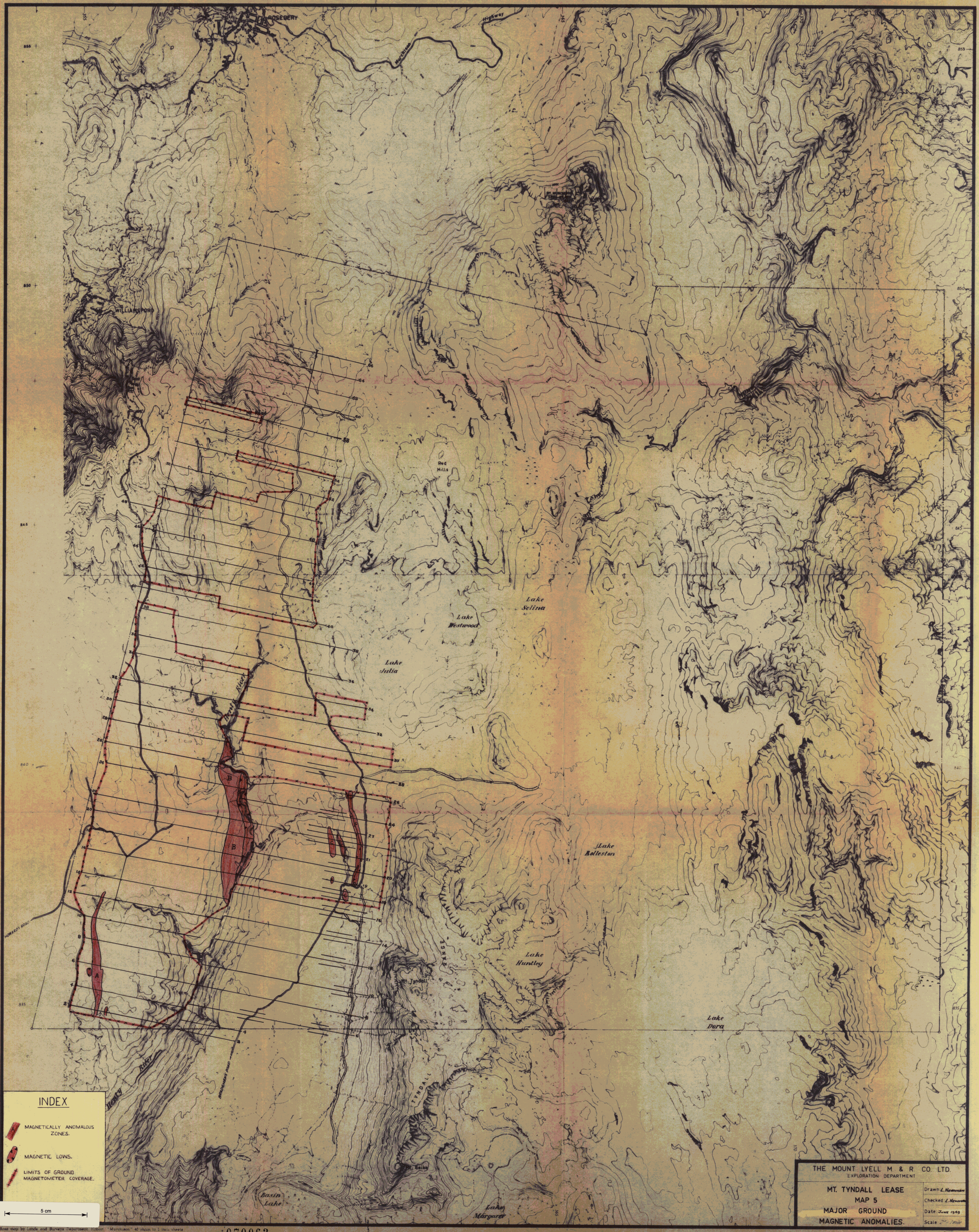
0 002



Base map by Lands and Surveys Department, Hobart "Murchison" 40 ch...

070061

003



INDEX
MAGNETICALLY ANOMALOUS ZONES.
MAGNETIC LOWS.
LIMITS OF GROUND MAGNETOMETER COVERAGE.
5 cm
THE MOUNT LYELL M. & R. CO. LTD.
EXPLORATION DEPARTMENT
MT. TYNDALL LEASE
MAP 5
MAJOR GROUND
MAGNETIC ANOMALIES.
Drawn: L. Newnham
Checked: L. Newnham
Date: June 1969
Scale: 2" = 1 mile
Lake Westwood
Lake Selina
Lake Julia
Lake Rolleston
Lake Huntley
Lake Dora
Basin Lake
Henty River
BRADSHAW'S ROAD

Base map by Lands and Surveys Department Hobart "Murchison" 40 chain to 1 inch sheets

070063 69-569 005

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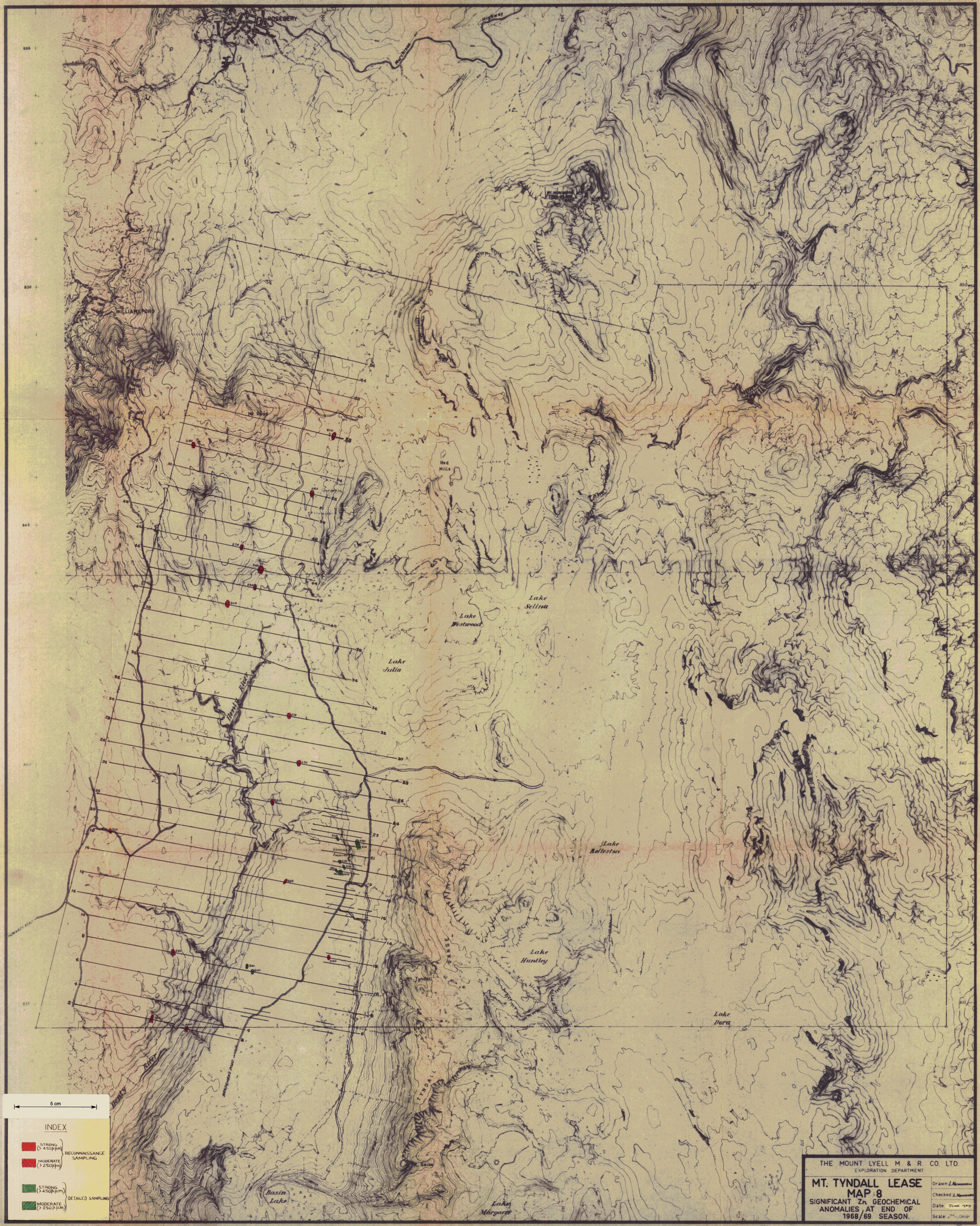
EXPLORATION DEPARTMENT

MT. TYNDALL LEASE
MAP 7.
SIGNIFICANT Pb GEOCHEMICAL ANOMALIES AT END OF 1968/69 SEASON

Drawn. L. NEWNHAM	
Checked. L. NEWNHAM	
Date. June 1969	
Scale 2" = 1 mile	

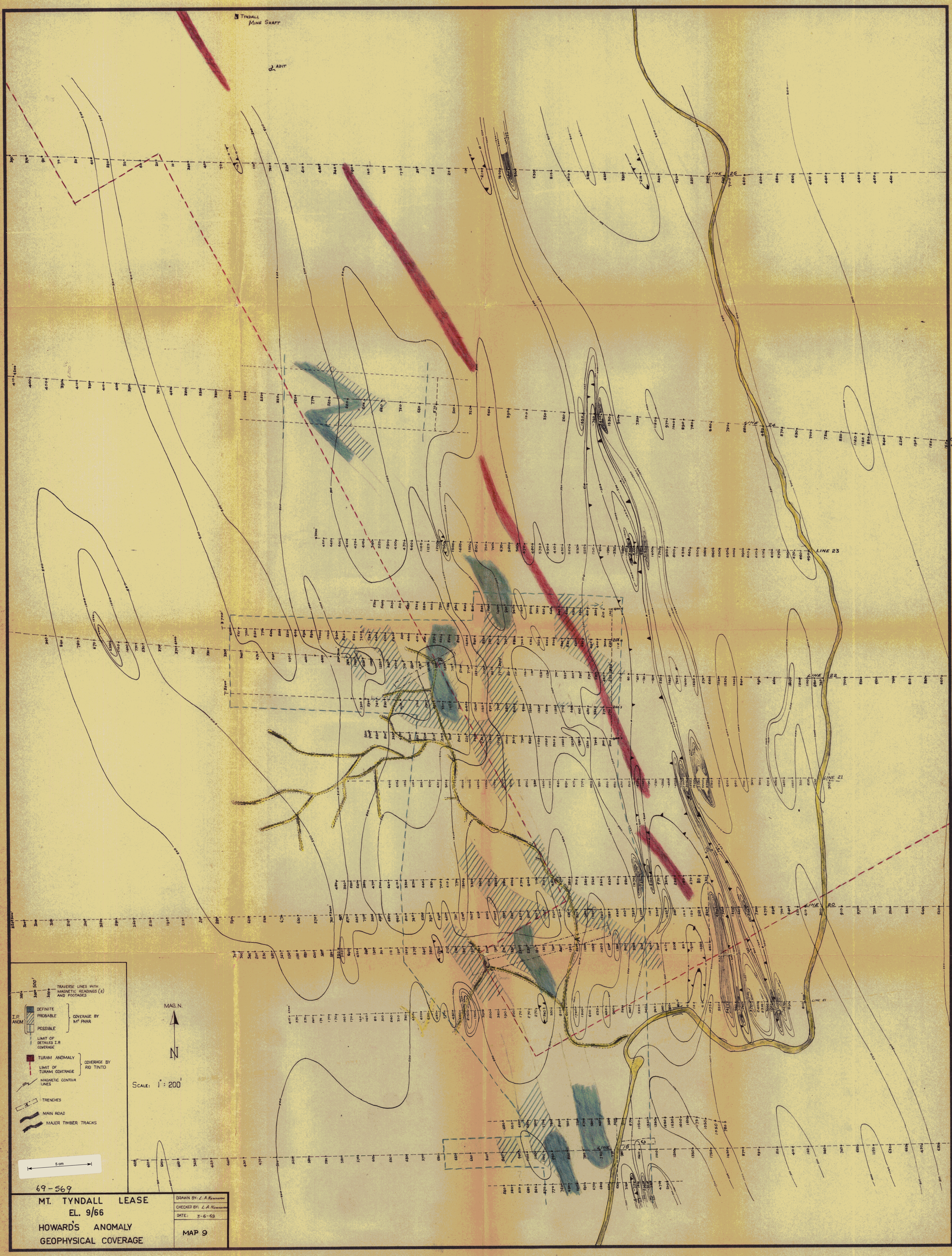
Base map by Lands and Surveys Department Hobart "Murchison" 40 chain to 1 inch sheets

070064 69-569 006



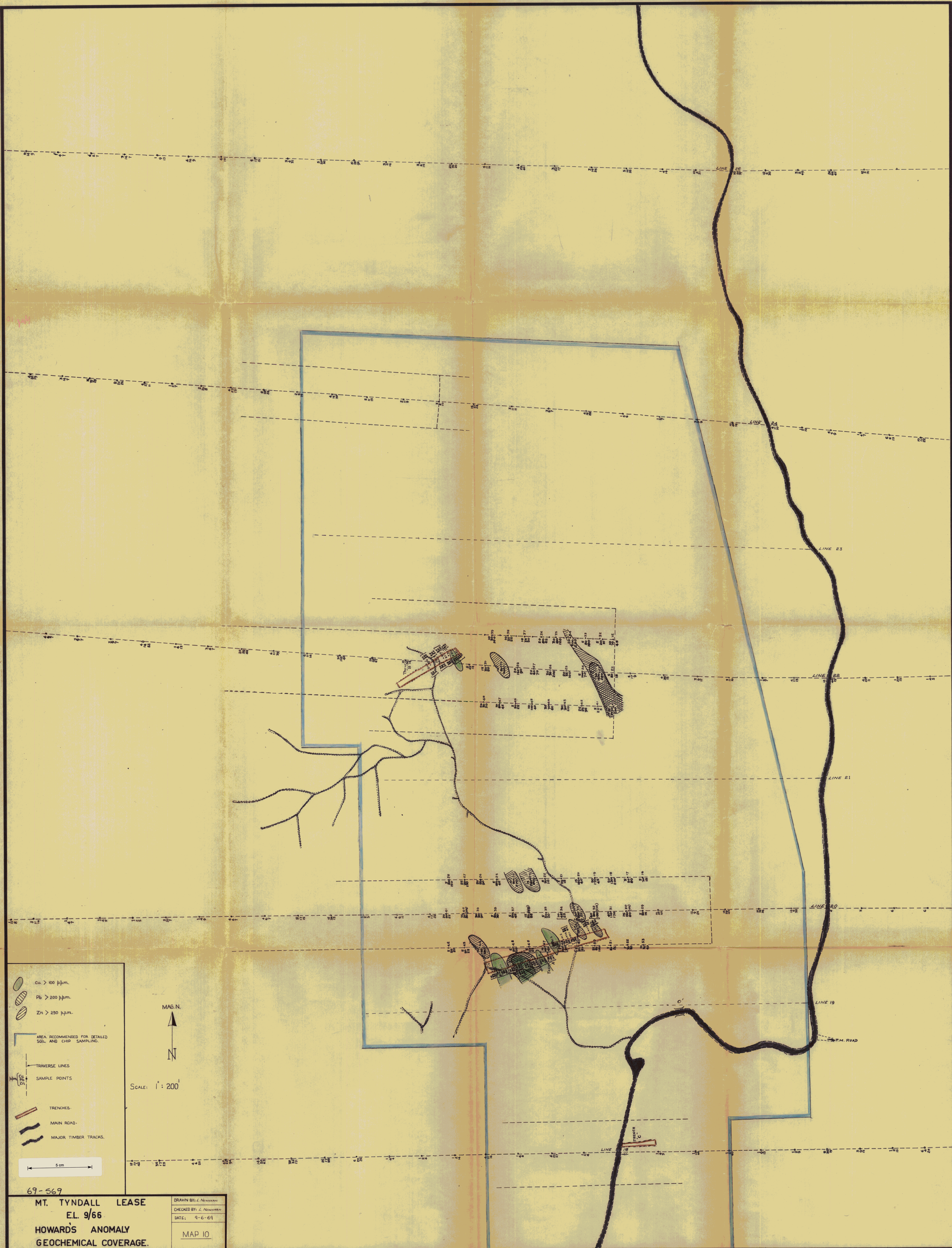
Base map by Lands and Surveys Department Hobart "Murchison"

070065 69-569 007



MT. TYNDALL LEASE
EL. 9/66
HOWARD'S ANOMALY
GEOPHYSICAL COVERAGE
DRAWN BY: L.A. NEWNHAM
CHECKED BY: L.A. NEWNHAM
DATE: 3-6-69
MAP 9
69-569
TRAVERSE LINES WITH MAGNETIC READINGS (γ) AND FOOTAGES
I.P. ANOM.
DEFINITE
PROBABLE
POSSIBLE
COVERAGE BY Mc PHAR
LIMIT OF DETAILED I.P. COVERAGE
TURAM ANOMALY
LIMIT OF TURAM COVERAGE
COVERAGE BY RIO TINTO
MAGNETIC CONTOUR LINES
TRENCHES
MAIN ROAD
MAJOR TIMBER TRACKS
MAG. N.
N
SCALE: 1" : 200'
5 cm
TYNDALL MINE SHAFT
ADIT
LINE 20
LINE 21
LINE 22
LINE 23
LINE 24
LINE 25

008 070066



69-569

MT. TYNDALL LEASE E.L. 9/66 HOWARD'S ANOMALY GEOCHEMICAL COVERAGE.	DRAWN BY: L. Newnham CHECKED BY: L. Newnham DATE: 9-6-69 MAP 10

070067 009

059

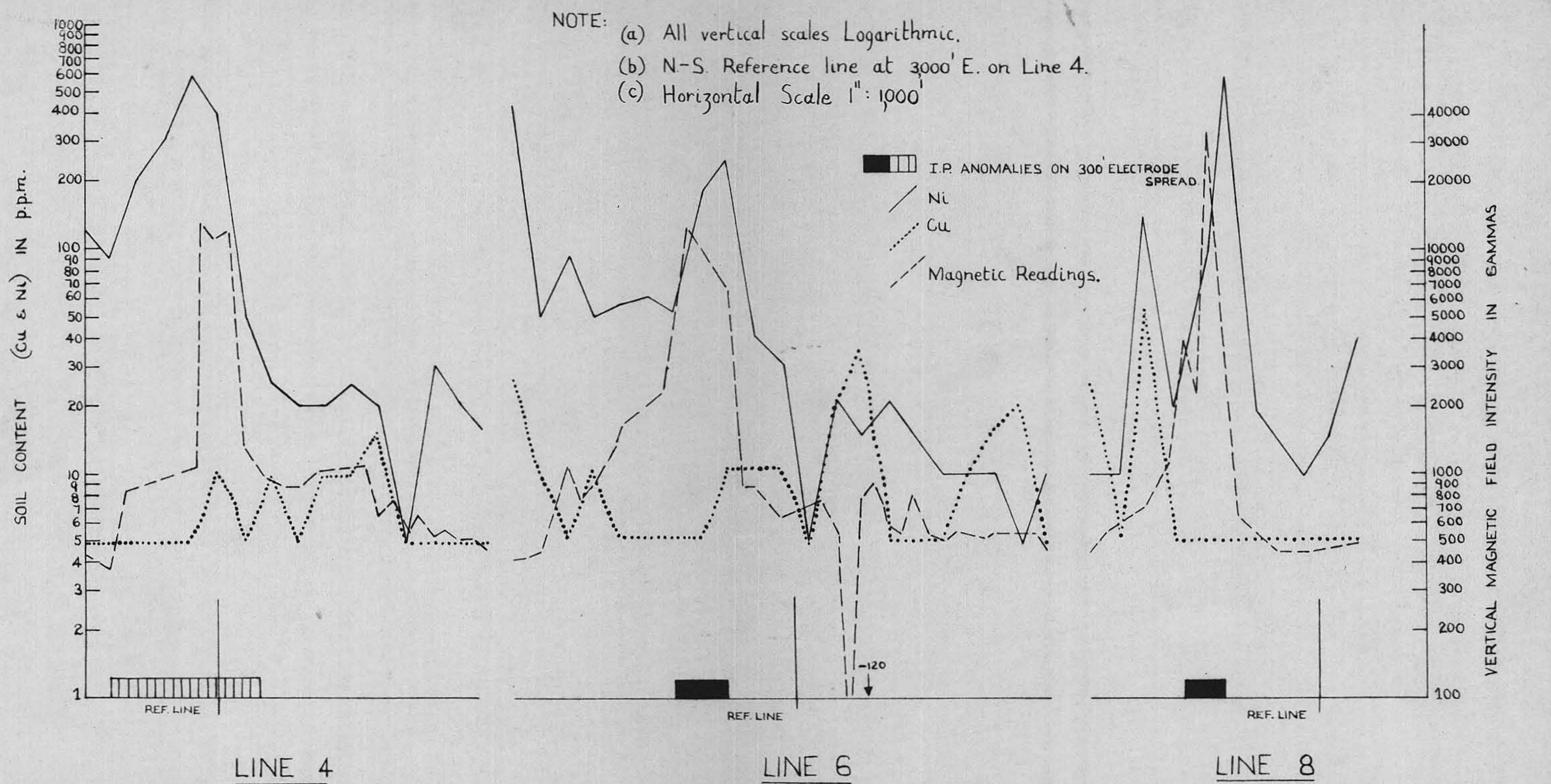
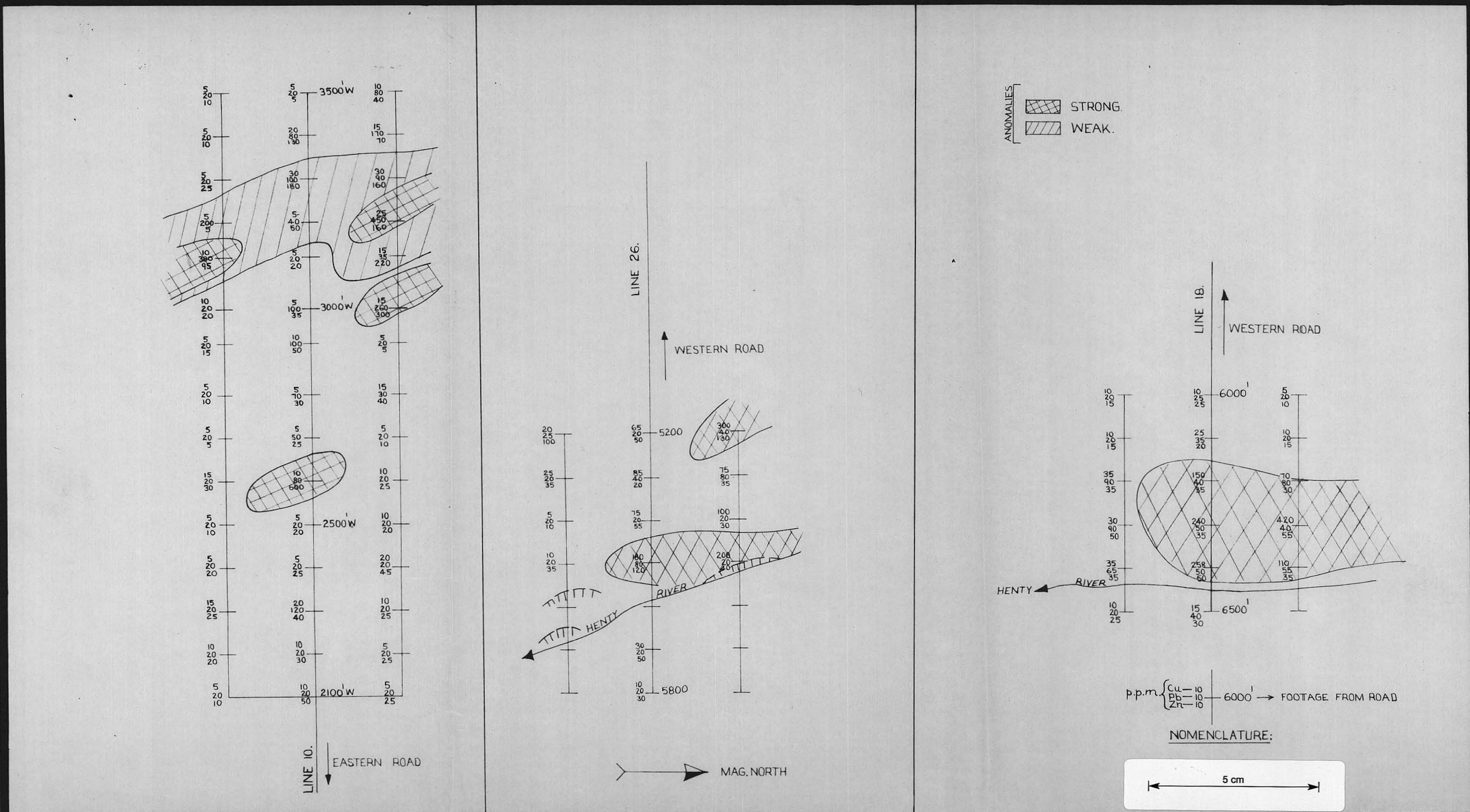


Fig: (2) GEOPHYSICAL & GEOCHEMICAL RESULTS OVER S/W. SERPENTINE – GABBRO BODY.

L.A. Newnham

69-569

070068



SCALE: 1" = 200'

Fig: (3) RESULTS OF DETAILED GEOCHEMICAL SOIL SAMPLING CONSIDERED SIGNIFICANT.

69-569

058

070070 69-569

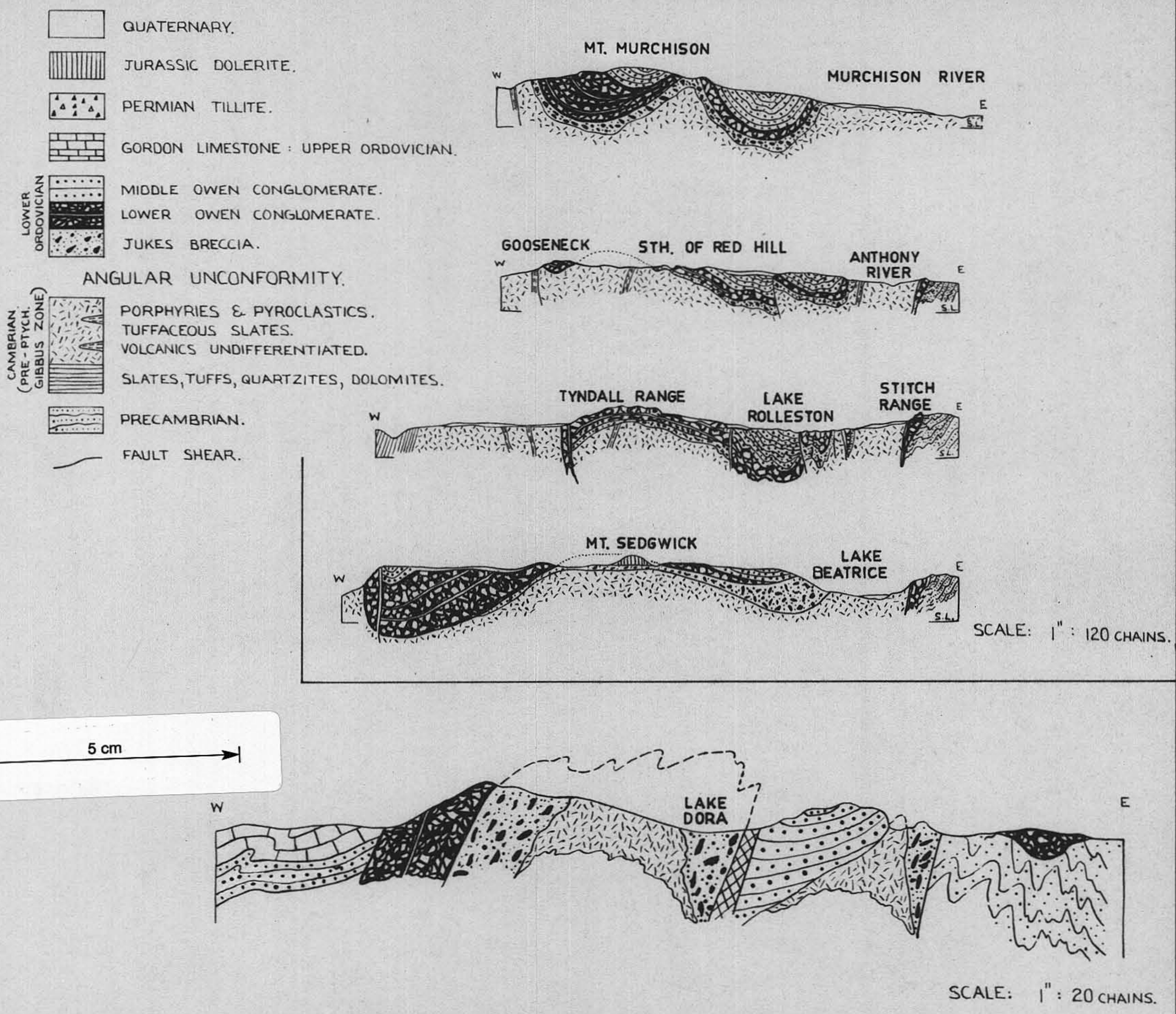


Fig: 4. RELEVENT RIO TINTO SECTIONS THROUGH EAST TYNDALL AREA. (AFTER CAMPANA 1959)

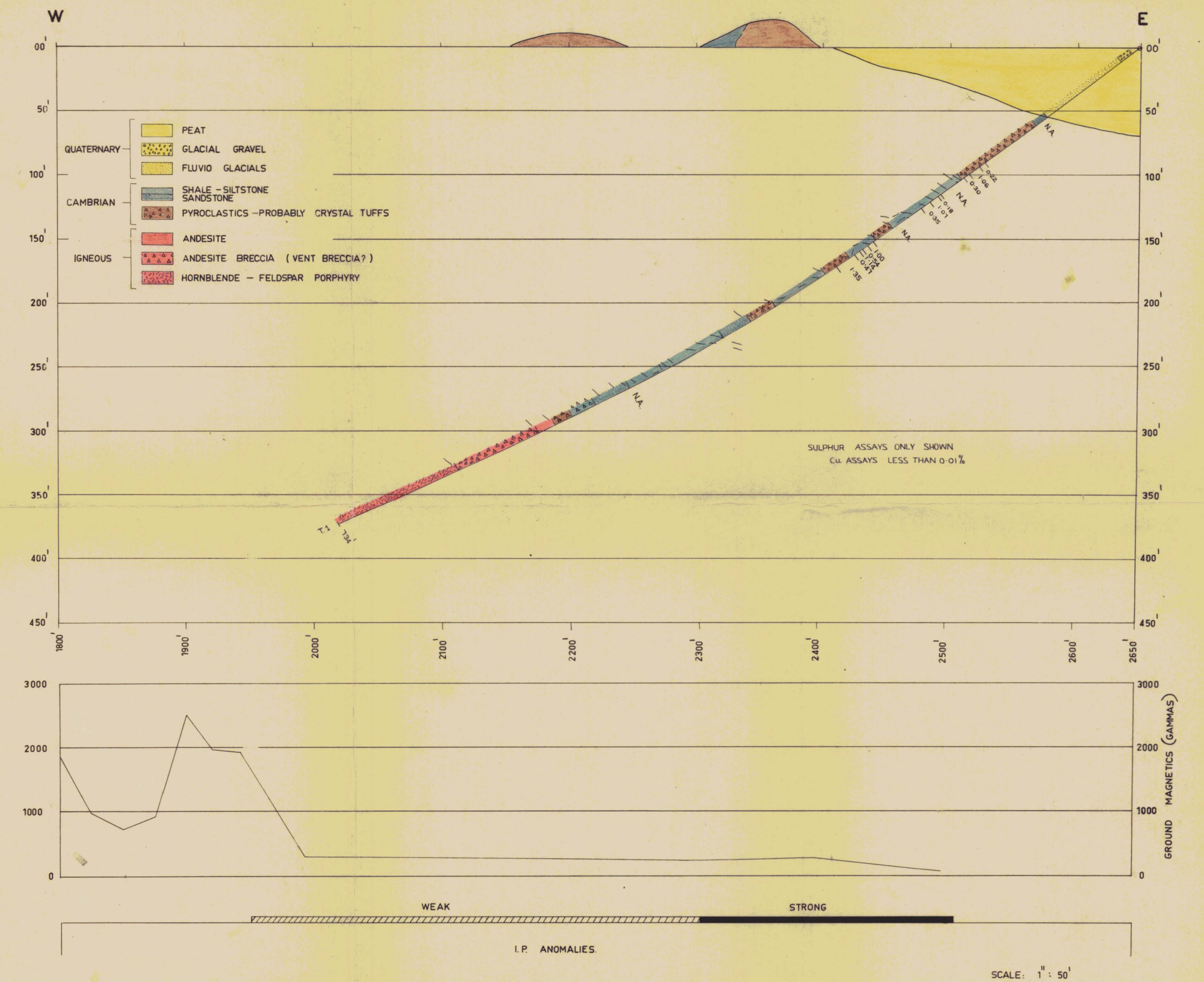


Fig: 5. TYNDALL DIAMOND DRILL HOLE No. 1 ALONG LINE 12.

69-569

011 070071

R.G.W. 14-7-1969