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ANNUAL REPORT

ON

E.L. 10/69

(DORA-HUXLEY AREA)

**MICROFILMED**

1972-73

BY:

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Copies To: General Office  
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Tas. Mines Department

August, 1973

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(a)    Through Whip Spur

(b)    Mt. Sedgwick-Lake Beatrice

Map 3                      East End of Mt. Lyell

Geophysical Results

Map 4                      Proposed Geophysical Grid - South of Lyell  
Highway

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1. INTRODUCTION

Exploration Licence 10/69 covers an area of 45 square miles from Lake Dora southwards to the King River. The present licence area resulted from the amalgamation of Exploration Licences 40/70 and 10/69 in December, 1970. For further information the reader is referred to "Annual Report 1971-72, Dora-Huxley Area, E.L. 10/69" by K. Wells.

During the year work was concerned with two main areas:

- (a) South of the Lyell Highway - geological mapping.
- (b) Eastern end of Mt. Lyell - geophysical survey.

Expenditure over the year amounted to \$10,828 and total expenditure on E.L. 10/69 since 1969 has reached \$49,212. A budget of \$23,600 has been proposed for the 1973-74 season.

2. WORK COMPLETED 1972-73

2.1 Mt. Huxley - Lyell Highway

2.1.1 Access

To give access into the south-western part of the lease, four existing lines of the Mt. Huxley grid, 32N, 16S, 48S, 80S, were extended westwards to meet either the Huxley road or the walking track to the east of Miner's Slate Ridge. Walking tracks originating at Lynchford were also cleared. Tracks totalling 10 miles were cut in the area.

2.1.2 Geological Mapping

Recent developments concerning the Cambrian succession in the Queenstown area (Corbett et al) have allowed more meaningful delineation of geological units and promoted a greater understanding of the volcanic sequence.

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The general succession is one of younging to the west. To the east the Cambrian rocks are faulted against, and overlain by Ordovician Owen Conglomerate. Westwards from the Ordovician, the succession passes from Darwin and Huxley type rhyolites, through Queenstown pyroclastics into Comstock Tuffs and/or Jukes Conglomerate of the Tyndall Group. These are overlain to the west by Post-Cambrian, Lower Palaeozoic sediments.

The Cambrian rocks generally dip steeply to the west, although two small synclines occur, one centred on Whip Spur, and the other to the west of Miner's Slate Ridge (see Section C-D).

The oldest stratigraphic unit is found to the east of Whip Spur, where a small outcrop of Darwin Type Rhyolite is in faulted contact with Owen Conglomerate. This rhyolite is a pink, very hard, massive rock containing small phenocrysts of albite ( $< 2\text{mm}$ ) in a very fine grained siliceous groundmass. The rhyolite mass includes a breccia containing fragments of the Darwin Rhyolite, up to 10 cm long. The whole sequence appears to interfinger, north and south, with the overlying Huxley type rhyolite.

The Huxley Rhyolite sequence contains lavas, tuffs, agglomerates, breccias and very minor sediments. This sequence is dominantly composed of coarse grained purplish rhyolites containing occasional felspar phenocrysts, though quartz phenocrysts are generally absent. The groundmass is coarser and darker coloured than that of the Darwin Rhyolite, and is composed of felspar and minor ferro-magnesian minerals. Weathered

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surfaces are pale grey-buff and have typical "sandy" textures where the feldspars and ferro-magnesian minerals have been weathered out leaving the quartz grains in relief. (It is to be noted, however, that the Sedgwick rhyolites (Map 2) which are a stratigraphic equivalent of the Huxley rhyolites, are typified by quartz phenocrysts in a light coloured matrix).

To the north and west, the Huxley type lavas pass laterally into the "Queenstown" Pyroclastic sequence of tuffs, agglomerates, breccias, ignimbrites, sediments and very minor lavas. Both crystal and lithic tuffs occur and are generally acidic containing fragments of the underlying acid lavas. These tuffs are occasionally very coarse grained, often being sheared and chloritized. The agglomerates are usually in the form of thin bands or finite lenses, though a large outcrop occurs on the summit of Little Owen. This agglomerate contains acid lava fragments up to 50 cm in diameter, exhibiting flattening and cooling cracks, suggesting that the fragments were still plastic when deposited. This agglomerate passes laterally into quartz rich sericitic rocks very similar to those nearer the Mine.

The agglomerate on the summit of Little Owen forms the core of a syncline which is probably an extension of the structure on Whip Spur. The syncline is intruded (?) by a quartz porphyry to the west and two andesitic bodies in the central zone. The quartz porphyry is severely weathered and outcrops generally consist of clear quartz phenocrysts up to 2 mm in

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diameter within a matrix of white clay. Similar porphyries occur in the south, one near the junction of the King and Queen Rivers, and two small concordant bodies to the west of Miner's Slate Ridge.

The andesite bodies weather to a typical chocolate brown soil but fresh samples contain phenocrysts of pyroxene and plagioclase in a fine grained matrix of feldspar, pyroxene, quartz and chlorite. Adjacent to the two bodies can be found a halo (up to 25' wide) of sulphide mineralization, mainly pyrite with minor chalcopyrite. Andesites occur again to the south, two smaller concordant bodies to the east of Miner's Slate Ridge, and a larger body near the western margin of the Queenstown Pyroclastics.

Sediments within the Queenstown Pyroclastics include black shales and siltstones, while sandstones occur on Miner's Slate Ridge.

To the south west, the Queenstown Pyroclastics have an increasing percentage of sediments, with greywackes, shales and siltstones appearing. These sediments are possibly part of the Henty-Yolande Greywacke sequence which occurs nearer the centre of the Dundas Trough (Corbett et al).

The greywackes are generally fresh, grey-green in colour, containing quartz, feldspar and a little mica, and also small fragments (1-2 mm) of the underlying volcanics. Sometimes they are graded and often banded.

The Queenstown Pyroclastics are unconformably overlain on the eastern side of the Queen River Valley, by the Comstock Tuff (formerly Quartz Keratophyre Agglomerate), the basal member of the Tyndall Group (Corbett et al). This tuff unit consists largely of fresh stumpy albite and diopside (augite) crystals with areas rich in rock fragments, both acidic and andesitic. The fragments are embedded in a matrix of quartz with chlorite, epidote and sericitized albite, and in many places an albite alteration halo can be seen around the fragments.

Westwards the Comstock Tuffs are in faulted contact with Queenstown Pyroclastics (see Map 2) which are again unconformably overlain by the Jukes Conglomerate of the Tyndall Group. These are all overlain unconformably to the west by Post-Cambrian Palaeozoic sediments of the Junee and Eldon Groups.

## 2.2 East End of Mt. Lyell

Cambrian rocks are exposed on the eastern end of Mt. Lyell, in the core of a westwards plunging anticline. They cover an area of approximately 2 square miles and consist of Jukes Conglomerate which is part of the Tyndall Group, and therefore are above the unconformity which overlies the schistose mineralised volcanics containing the Mt. Lyell orebodies.

To try and evaluate the depth of the Jukes Conglomerate above the unconformity, a Schlumberger electrical survey was undertaken by Scintrex Pty. Ltd. in March, 1973. (Fig. 3).

In preparation for this survey two lines were cut and pegged at right angles to each other across the Cambrian exposure.

These lines originated at a point on the old Comstock Tramway and extended to the outcrop of Post-Cambrian rocks. The footages of the lines were: 3000'N and 5400'S, 3000'W and 3500'E.

A Schlumberger expander method was used for the electrical survey. Three electrical soundings (No. 1 centre 00/00, run east/west; No. 2 centre 00/00, run north/south; No. 3 centre 00/2500S, run north/south) were taken, the results of which are shown in Fig. 3. For soundings No. 1 and No. 2 an initial potential electrode spacing of 10 feet was employed and this was increased to 25 feet when the current electrode spacing was greater than 2000 feet. Sounding No. 3, because of bad ground conditions, required potential electrode spacings of 3 feet, 5 feet, 10 feet and 25 feet, with respective measurements of 20 - 200 feet, 200 - 400 feet, 400 - 1200 feet and 1200 - 4000 feet for the current electrode spacings.

The Jukes Conglomerate contact with the "Lyell Schists" was estimated to be at a minimum depth of 500 feet, but results were inconclusive in establishing the true depth to the unconformity. Surface inhomogeneity and inhomogeneity within the Jukes Conglomerate have tended to mask the information from depth. Contacts were indicated on soundings No. 1 and No. 3 but these are certainly too shallow to be of significance and are probably due to either local variations within the Jukes Conglomerate, possibly sedimentary units, or to the top of the water table.

3. RECOMMENDATIONS AND CONCLUSIONS

3.1 Geological Mapping

3.1.1 Present Situation

Work in the area south of the Lyell Highway has now clarified the relationship between the individual rock units. Last year it was thought that two unconformities existed within the Cambrian sequence; a lower unconformity between the Huxley type rhyolites and the Queenstown Pyroclastics, and an upper unconformity between the Queenstown Pyroclastics and the Comstock Tuffs. Mapping has shown that the contact between the Huxley Rhyolites and the Queenstown Pyroclastics is one of lateral interfingering and not an unconformity. The occurrence of the upper unconformity, immediately below the Comstock Tuffs, has been confirmed and extended and has been correlated with the unconformity overlying the Comstock orebodies. This unconformity is of significance in that it separates the overlying unmineralized rocks from the lower mineralized sequences.

Although not fully mapped, the basic structure and geology south of the Lyell Highway has now been fairly well co-ordinated. Only one area, around Roaring Meg Creek, remains to be mapped and this will be completed during the winter.

Two further areas of Cambrian rocks remain to be resolved within the exploration licence:

- (a) The Cambrian exposure on the east end of Mt. Lyell needs to be correlated with the geophysics undertaken in the previous field season.
- (b) The Mt. Sedgwick-Lake Beatrice-Lake Dora flank still remains undifferentiated and unrelated to the Cambrian sequence elsewhere.

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3.1.2 Winter Programme

Weather permitting, two areas can be mapped during the winter months. Roaring Meg Creek would be a one or two day excursion and the east end of Mt. Lyell could be completed in one day with a group coverage by three geological teams.

3.1.3 Summer Programme

(a) Mt. Sedgwick-Lake Beatrice-Lake Dora.

The northern part of this belt of Cambrian rocks between Lake Dora southwards to Lake Spicer, can be reached by road from the Mt. Tyndall Lease (E.L. 9/66). One geologist based at the Lake Rolleston camp on the Tyndall Lease would be able to map this area quite rapidly. The Mt. Sedgwick-Lake Beatrice area is relatively inaccessible, with rugged terrain and, in many places dense vegetation, making access and mapping difficult. An area of similar inaccessibility was overcome, in the 1970-71 field season, by use of a helicopter, and if possible this method could again be employed.

(b) King River

The King River Gorge from Mt. Huxley to its junction with the Queen River still remains unmapped. The good exposure along the gorge would be of great assistance in a final interpretation of the Cambrian stratigraphy and structure. This traverse is dependant on an extended period of fine weather to reduce the level of water to allow safe access to the area.

### 3.2 Geophysics

Geological mapping south of the Lyell Highway has outlined two zones of sulphide mineralisation:

1. The Great Lyell/Duke Lyell area is known to be mineralised with pyrite and chalcopyrite for a distance of at least 6000' and previous geophysical surveys have outlined anomalies over the zone (see Sections 2.2.2, 2.2.3, 4.4 and 5, Annual Report E.L. 10/69, K. Wells).
2. Two andesitic bodies occurring to the south west of the Great Lyell/Duke Lyell area have haloes of sulphides, with both pyrite and chalcopyrite outcropping over widths of approximately 25'.

To cover both these zones it is recommended that the area between the Lyell Highway and Whip Spur be surveyed using large current, dipole, gradient-array induced polarisation. The survey will be over a grid with a line spacing of 600' which gives a total of 132,000 line feet (Map 4). Any anomalous zones outlined by the gradient array should be detailed using either a pole-dipole method or M.I.P. (magnetic I.P.) to define suitable drilling targets.

### 3.3 Staffing

To complete the summer programme one geologist and one field assistant will be required for most of the season, supplemented occasionally by other personnel for specific assignments.

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4. PROPOSED BUDGET

Budget for E.L. 10/69, 1973-74

<u>Item</u>	<u>Cost</u>
Salaries (Geologist and Field Assistant)	\$ 7,900
Outside Service (Track Cutting, etc.)	\$ 1,000
Geology (Slide Preparation, etc.)	\$ 1,800
Materials	\$ 900
Geophysics	\$12,000
Total	<u>\$23,600</u>



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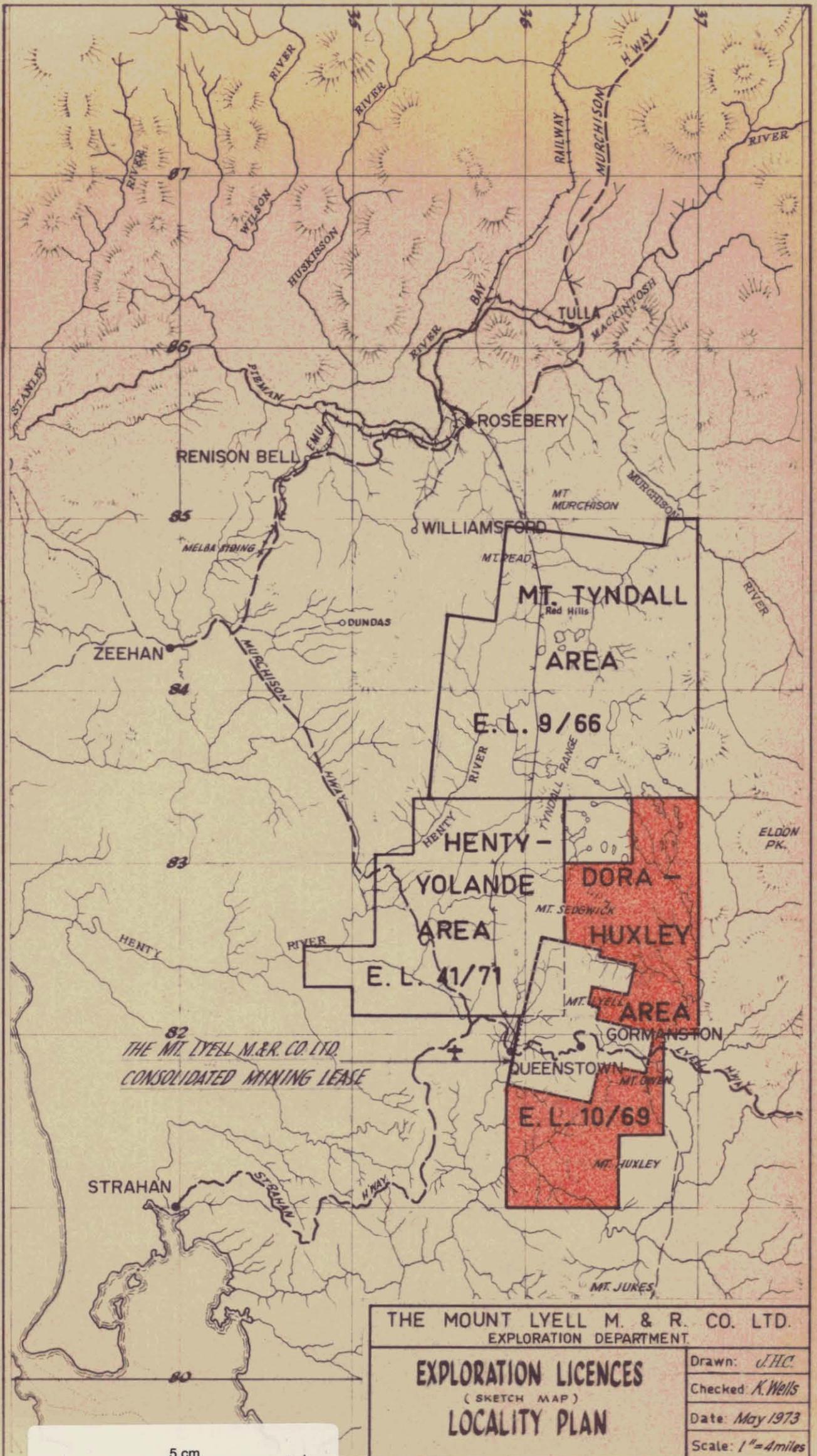
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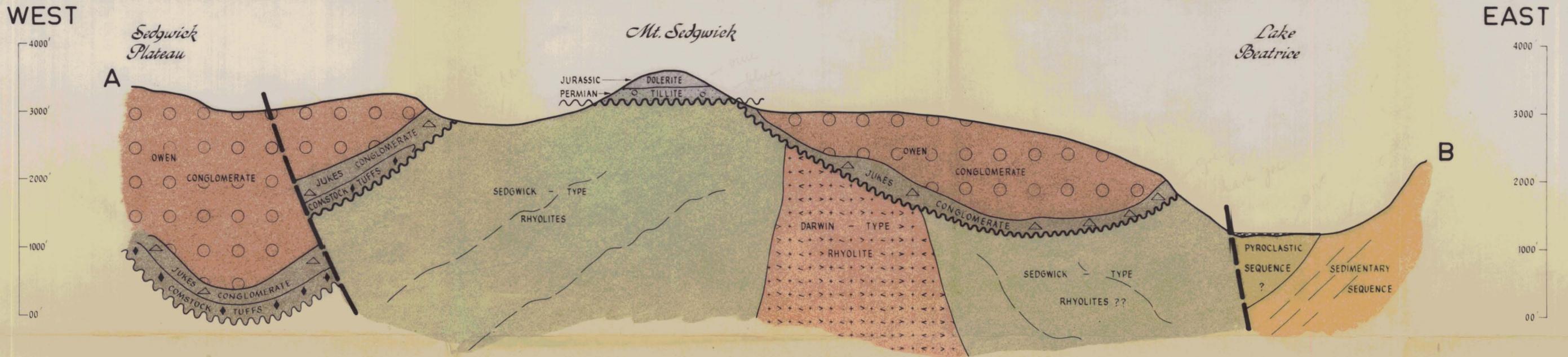
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EXPLORATION DEPARTMENT.

**EXPLORATION LICENCES**  
( SKETCH MAP )  
**LOCALITY PLAN**

Drawn: J.H.C.
Checked: K.Wells
Date: May 1973
Scale: 1" = 4 miles

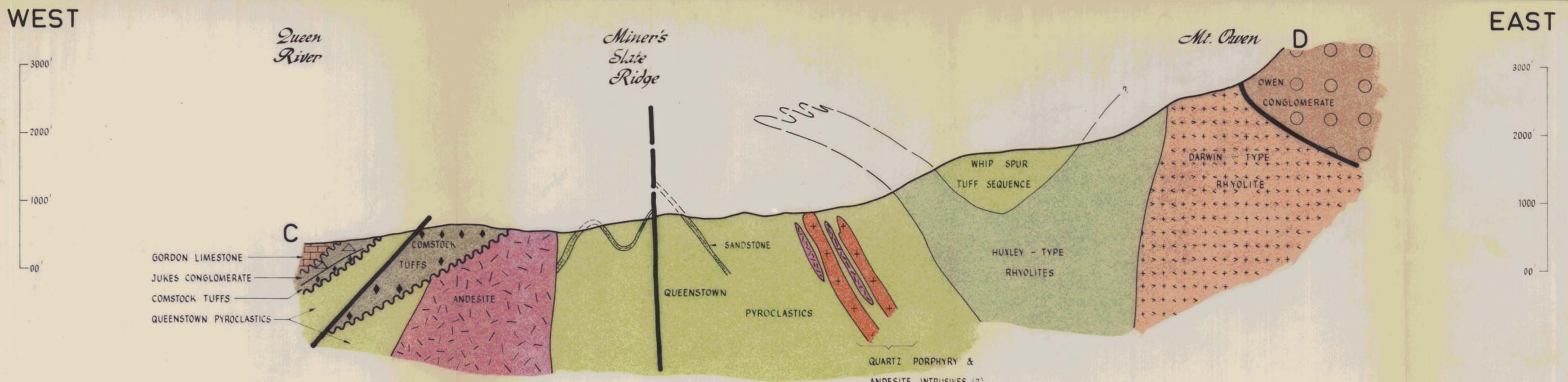
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MAP. 1.



CROSS-SECTION A-B THROUGH MT. SEDGWICK

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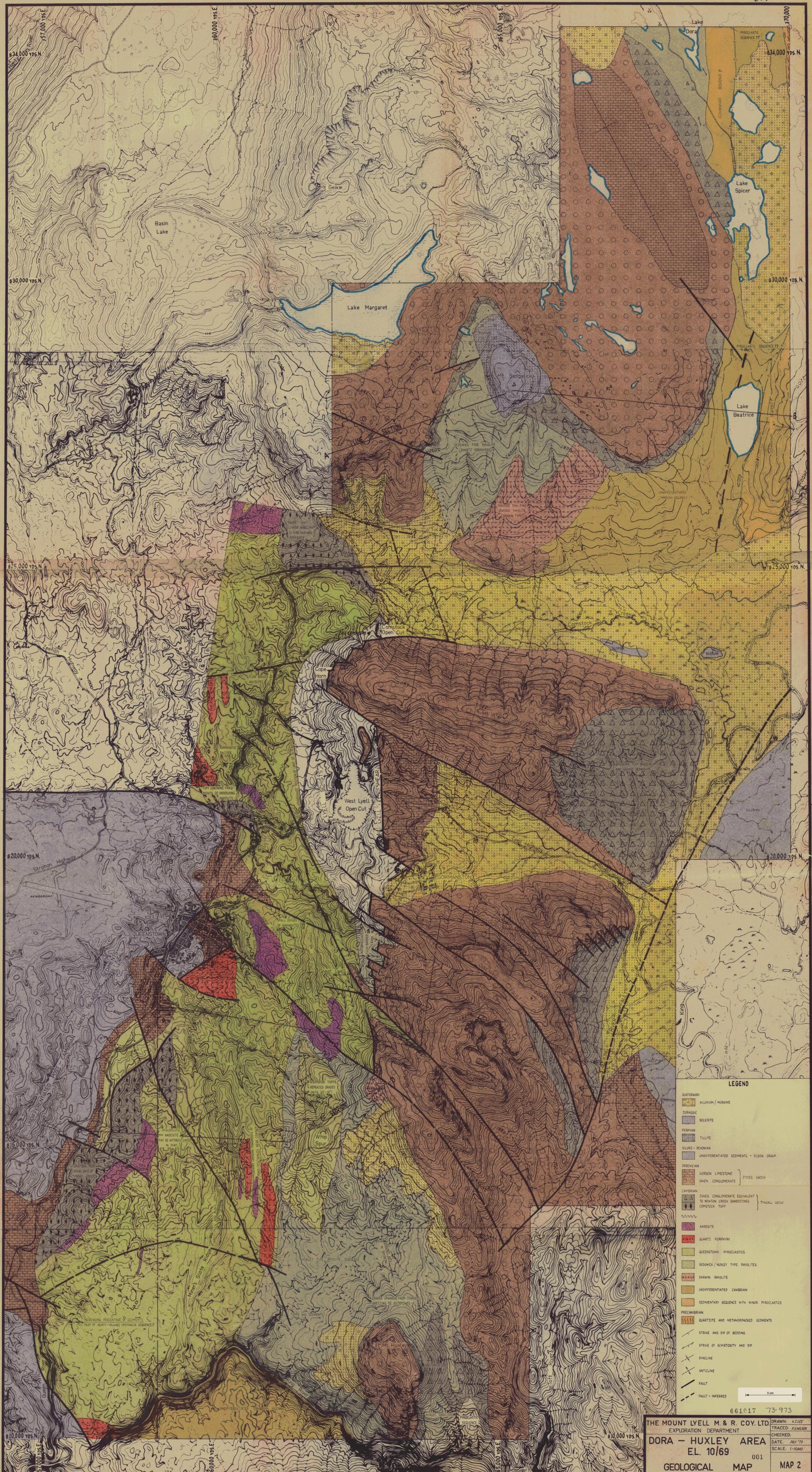


CROSS-SECTION C-D THROUGH WHIP SPUR

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5 cm

NOTE: LEGEND AS FOR GEOLOGICAL MAP - MAP 2



**LEGEND**

- QUATERNARY
  - ALLUVIUM / MORANE
- JURASSIC
  - DOLERITE
- PERMIAN
  - TILLITE
- SILURO-DEVONIAN
  - UNDIFFERENTIATED SEDIMENTS - ELDON GROUP
- ORDOVICIAN
  - GORDON LIMESTONE } JINJEE GROUP
  - OWEN CONGLOMERATE
- CAMBRIAN
  - JINJEE CONGLOMERATE EQUIVALENT } THYNAL GROUP
  - NEWTON CREEK SANDSTONES
  - COMSTOCK TUFF
- ANDESITE
- QUARTZ PORPHYRY
- QUEENSTOWN PIROCLASTICS
- SEDGWICK / HUXLEY TYPE RHYOLITES
- DARWIN RHYOLITE
- UNDIFFERENTIATED CAMBRIAN
- SEDIMENTARY SEQUENCE WITH MINOR PIROCLASTICS
- PRECAMBRIAN
  - QUARTZITE AND METAMORPHOSSED SEDIMENTS
- STRIKE AND DIP OF BEDDING
- STRIKE OF SCHISTOSITY AND DIP
- SYNCLINE
- ANTICLINE
- FAULT
- FAULT - INFERRED

Scale: 1:15,840

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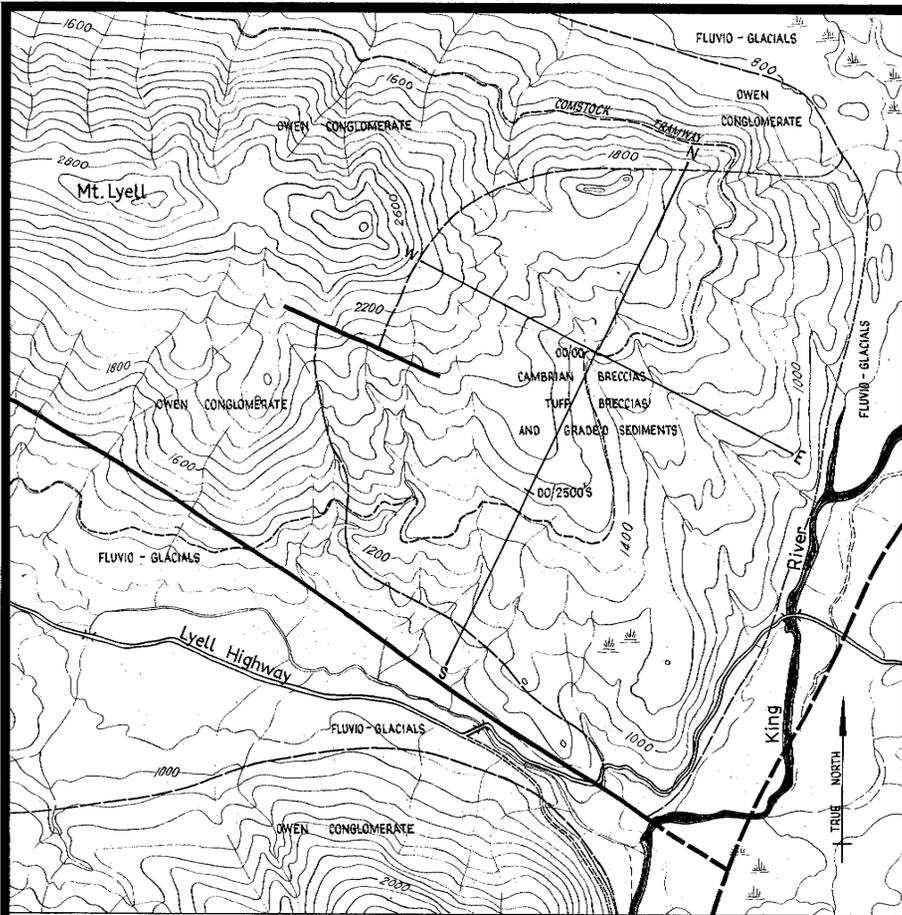
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**DORA - HUXLEY AREA**  
E.L. 10/69

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GEOLOGICAL MAP MAP 2

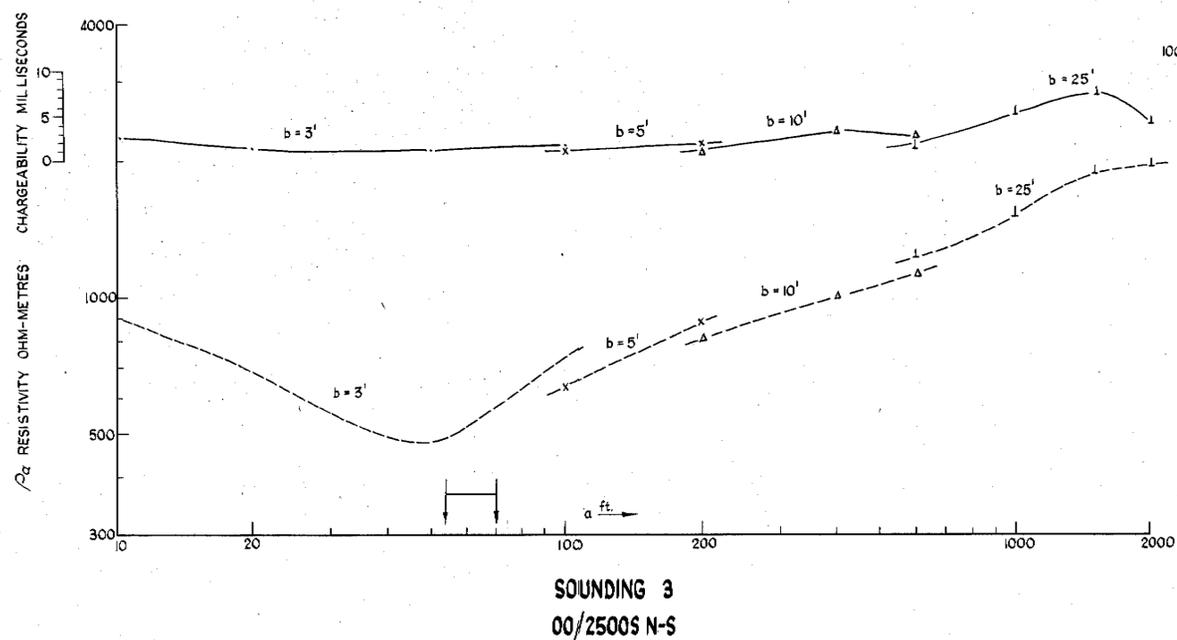
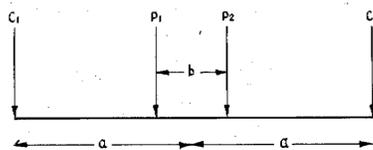
DRAWN: A.L.LEE  
TRACED: R.B.MCGIBB  
CHECKED:  
DATE: JULY 79  
SCALE: 1:15,840



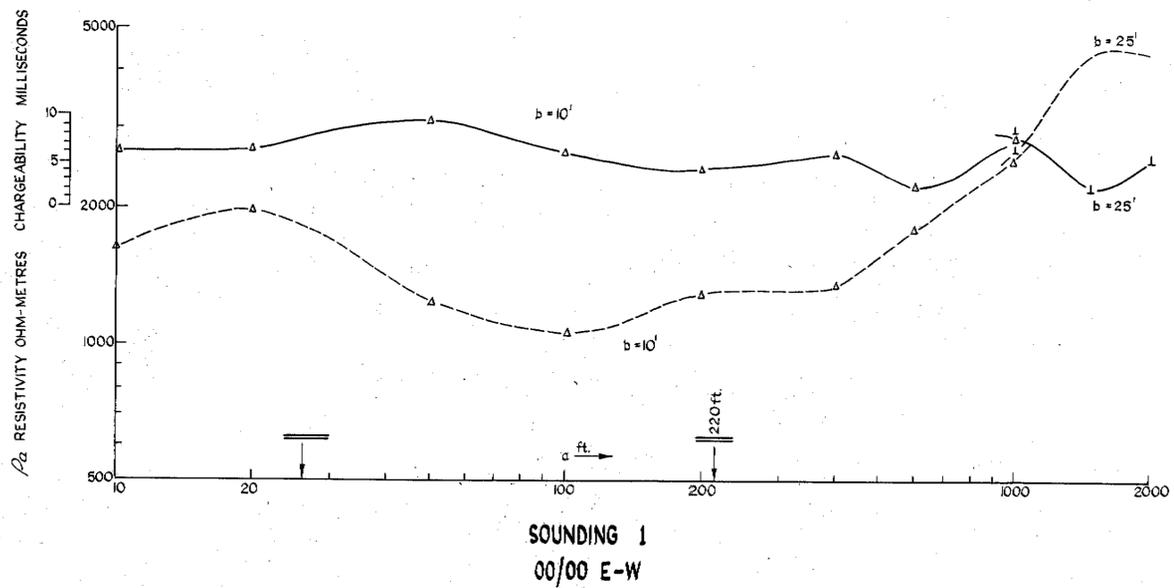
LOCALITY PLAN

SCALE: 4" = 1 MILE

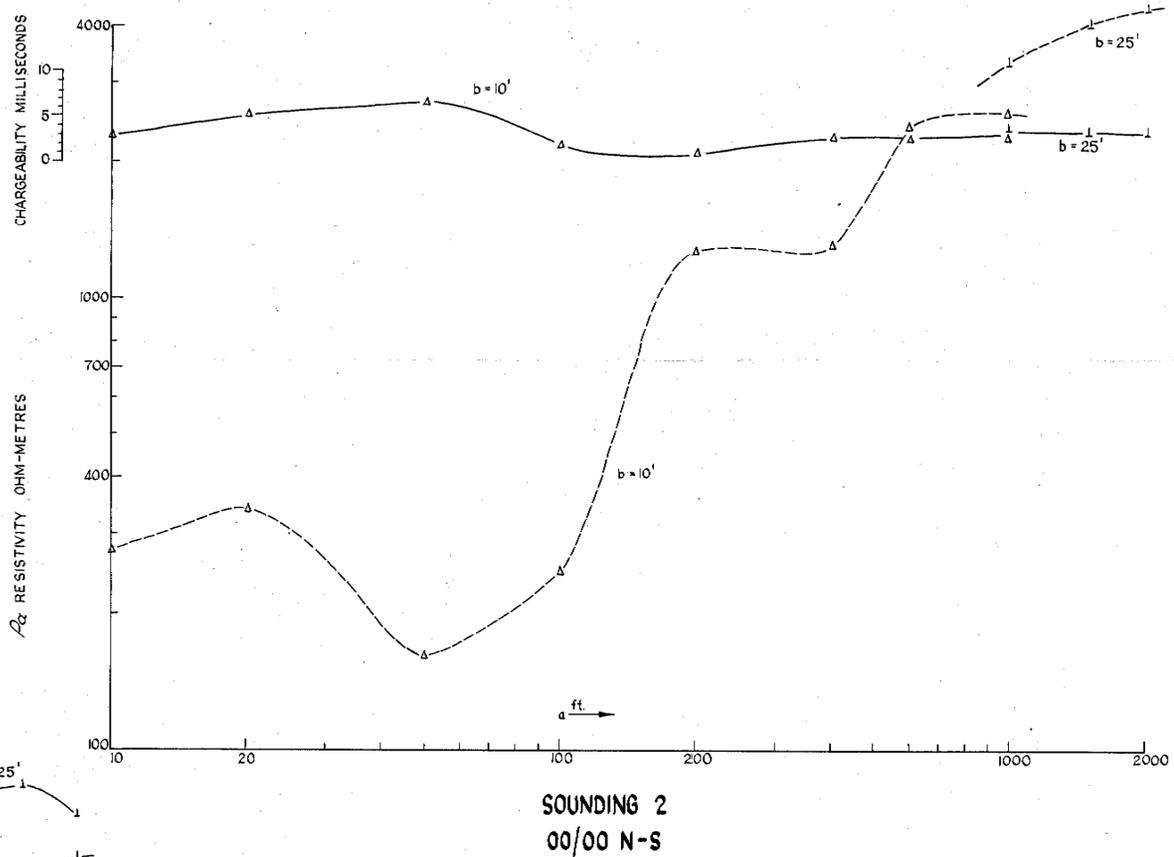
SCHLUMBERGER ARRAY



SOUNDING 3  
00/2500S N-S



SOUNDING 1  
00/00 E-W



SOUNDING 2  
00/00 N-S

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5 cm

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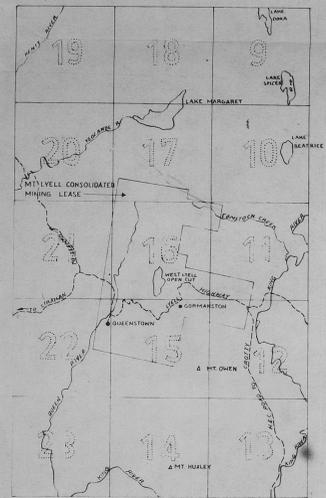
THE MOUNT LYELL M. & R. COY. LTD.		DRAWN. R.G. WILSON.
EXPLORATION	DEPARTMENT	TRACED. A.G. WILSON.
DORA - HUXLEY AREA		CHECKED. K.WELLS.
E.L. 10/69		DATE. 3-9-73
EASTERN END OF MT. LYELL		SCALE. AS SHOWN
ELECTRICAL SOUNDINGS 003		MAP 3



- QUATERNARY
  - MORAINES AND SCREE
- SILURO - DEVONIAN
  - SHALES AND SANDSTONES
- ORDOVICIAN
  - GORDON LIMESTONE
  - PIONEER BEDS
  - OWEN CONGLOMERATE
- CAMBRIAN
  - JUKES CONGLOMERATE WITH SEDIMENTS } TINDALL GROUP
  - COMSTOCK TUFFS
- ANDESITE INTRUSIVES
- QUARTZ PORPHYRY INTRUSIVE
- IGNIMBRITES TUFFS } (QUEENSTOWN) PYROCLASTIC SEQUENCE
  - AGGLOMERATES
  - SEDIMENTS
  - SANDSTONES
  - LAVAS
- IGNIMBRITES TUFFS } HUXLEY TYPE RHYOLITE SEQUENCE
  - AGGLOMERATES
  - SEDIMENTS
  - SANDSTONES
  - LAVAS
- DARWIN TYPE RHYOLITE / BRECCIA
- DEFINITE GEOLOGICAL BOUNDARY
- APPROXIMATE GEOLOGICAL BOUNDARY
- INFERRED GEOLOGICAL BOUNDARY
- SYNCLINE
- ANTICLINE
- BEDDING WITH DIRECTION OF DIP
- VERTICAL BEDDING
- SHEARING
- DIRECTION OF YOUNGING
- FAULT
- OLD WORKINGS
- OUTCROP
- P<sub>y</sub> PYRITE
- C<sub>cp</sub> CHALCOPYRITE
- ⊙ HEMATITE
- ⊙ QUARTZ VEINS



LOCATION



BRECCIA 10-15" WIDE ANGULAR FRAGMENTS OF ALTERED LAVA (WITH MINOR PYRITE) UP TO SEVERAL INCHES IN DIAMETER IN A BACKGROUND OF UNDIFFERENTIATED QUATERNARY - ELSCHMIDT QUARTZ PORPHYRY APPEARS TO CONTAIN FRAGMENTS OF BUFF PINK RHYOLITE SILTSTONES NEAR E. EDGE

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**DORA - HUXLEY AREA**  
E.L. 10/69  
PROPOSED GEOPHYSICAL GRID  
1973-74

DRAWN K. LEE  
TRACED R.G. WILSON  
CHECKED K. WELLS  
DATE 3-9-73  
SCALE 1" = 500'  
1" = 6000'

MAP 4  
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