

Que. McHegewi Mines Ltd. (1961)

SUMMARY REPORT

on

formerly

NEW THURBOIS MINES LIMITED
AGNEW LAKE URANIUM AREA PROPERTY

The following is a resume of geological information gained to November, 1955, through surface exploration and some 36,000 feet of diamond drilling on the Agnew Lake area property of New Thurbois Mines Limited.

LOCATION, EXTENT, ACCESS, etc.-

The property consists of 72 contiguous claims numbered as follows:

- S 70715, 16, 22 to 26, 28 to 30, 33, 34 and 38 to 47
- S 71987 to 92
- S 71128 to 44
- S 72128 to 32
- S 87204 to 11
- S 81409 to 14, and 32 to 37
- S 81768 to 73.

These claims comprise approximately 2,800 acres, and are located in Hyman Township, Sudbury Mining Division, Ontario, approximately 35 miles west of the City of Sudbury.

The property is some four miles north of Agnew Lake and is linked with that lake by a fair jeep road. The south shore of Agnew Lake may be reached by four miles of good gravel road from either McKerrow or Nairn. McKerrow and Nairn are on Highway #17, and on the Sault Ste. Marie branch of the Canadian Pacific Railway.



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Alternatively the property is accessible to Worthington by a gravel road extending north from Worthington, and approximately ten miles of tractor road extending right to the camp. This tractor road could be made passable for trucks at relatively little expense.

High tension power transmission lines are within six miles of the property.

GENERAL GEOLOGY

No adequate geological map of the claims is available. Heavy overburden precludes detailed mapping. An idealized plan, showing main features of interest, is appended.

All consolidated rocks are of Precambrian age. The Table of Formations is as follows:

- Keweenawan; Diabase and gabbro dikes and bosses.
- Killarneyan; Granite, granodiorite, diorite.
- Huronian; Mississagi Quartzite Fmn, - quartzite, argillite, conglomerate, etc.

Small diabase and related intrusives cut all other rocks and are found throughout the property.

Granites and related rocks intrude the sediments; they form a high ridge running along the north boundary of the property for its full width.

The sediments underlie the bulk of the claims. They have a northeast to east-west strike and near-vertical dip. An abbreviated crosssection of the rocks found, from north to south, is as follows:

- Granite,
- Greywacke and argillite,
- Coarse sericitic quartzite with interbedded pebble conglomerates;
- Argillite, minor greywacke and quartzite,
- Coarse sericitic quartzite with interbedded pebble conglomerates,
- Greywacke, minor argillite and boulder conglomerate,
- Fine-grained quartzite.

These sediments form an east-west striking and vertical-limbed syncline, with the axis bisecting the argillite member, and the north limb truncated by granite. In an embayment in the granite to the north of the synclinal axis, the sericitic quartzite is repeated one or more times by folding and possibly faulting.

ECONOMIC GEOLOGY

Extensive uranium-thorium deposits have been found in the pebble conglomerate beds within the sericitic quartzite. The ore is very similar to that found in the Blind River area a few miles to the west. The pebble beds are composed principally of quartzite pebbles in a quartz-sericite matrix with varying amounts of pyrite and pyrrhotite. Uranothorite, monazite, and uraninite have been identified as at least some of the uranium- and thorium-bearing minerals.

In the #2 and 3 zones described below there is a main ore-bearing conglomerate horizon, continuous but of varying width and grade. This horizon is flanked by two or more parallel conglomerates which are lenticular in habit, reappearing at irregular intervals in more or less the same stratigraphic position. In both the main and flanking conglomerates the walls are indefinite, there is a central higher grade core which grades outward into barren and more or less pebble-free quartzite.

Fairly accurate indications of the uranium grade are available. Thorium assays have been obtained, but no grade calculations have yet been made. Combined grade calculations will be difficult until such time as a price can be placed on the thorium, because the uranium-thorium ratio is extremely variable and the high-uranium sections are not necessarily the high-thorium sections. It is quite

possible to assay two adjoining and strongly radioactive sections of drill core and obtain from one an assay of 0.15% U_3O_8 with 0.05% ThO_2 , while the other assays 0.03 U_3O_8 with .5% ThO_2 .

As an overall arithmetic average of the uranium-rich sections, the thorium-uranium ratio is from 3:1 to 4:1. Grades and tonnages quoted below cover only the uranium-rich sections. If thorium-rich sections are to be included in ore calculations, then the tonnages can probably be increased by a factor of two or more.

Drilling to date indicates approximately 750,000 tons of uranium ore carrying 0.095% U_3O_8 , with a thorium content averaging about 0.3 to 0.35% ThO_2 . This is found in four zones described in detail below.

#2 Zone.

This zone occurs in the coarse sericitic quartzite on the south limb of the main syncline. It has been traced by diamond drill for a length of over 3,150 feet; it is cut off to the west by a fault and appears to be lensing out eastward.

Scattered values are obtained in all conglomerate beds, but the only one consistent enough to be included in the following calculations is the central bed.

Two tiers of holes have been drilled, cutting the zone at 100- and 300-foot depths, and one hole has cut the zone at 500 feet. The overall average grade is 0.079% U_3O_8 over a 5-foot width. There are indicated 1,325 tons per vertical foot.

Within the 3,150-foot length there are four higher grade shoots separated by low grade zones. These shoots rake downward to the east at an average angle of -35° . These shoots contain 900 tons per vertical foot with a grade of 0.09% U_3O_8 . The thorium content of the shoots is about 0.3% ThO_2 .

No appreciable change in character or grade was noted at depth. The nearest known granite is 800 feet to the north. There is good reason to expect that the values will persist down dip for an indefinite distance.

#3 Zone.

The #3 zone is found on the north limb of the syncline, in the embayment and immediately south of the granite. There are three sections. The B and C sections are merely two parts of the same zone separated by a fault. The A section, north of B, is believed to be a repetition of the same bed, on the north limb of an anticlinal fold.

The structure in the rocks adjoining the granite is very complex and has not been completely worked out. Among other complications there is a more or less flat thrust fault which has displaced both greywacke and granite so that these cap a portion of the #3 zone. Only deep drilling detected much of the ore.

3A Section.

This section lies entirely within the granite embayment. It has a length of approximately 650 feet, is cut off to east and west, and presumably at depth by granite. It is known to extend to a depth of at least 400 feet in the centre of the section.

There are three parallel conglomerate beds, the central one carrying consistent values for the full length of the section, and the southerly bed consistent for a length of 300 feet. From limited drilling these aggregate 560 tons per vertical foot grading 0.106% U_3O_8 . Thorium content is estimated to be 0.4% ThO_2 .

3B Section.

This section is 1,200 feet long. It is cut off to the west by granite and to the east by a fault.

The eastern portion is capped by overthrust granite and greywacke.

Granite is quite shallow to the west (300-400') but has not been intersected at depth to the east. Values occur in two and sometimes three parallel conglomerate beds. There has been insufficient drilling to arrive at any ore estimates. Values are erratic, ranging from 0.096% U₃O₈/39.0' through 0.35% U₃O₈/2' to 0.05% U₃O₈/7.0'. There is a similar variation in thorium values.

3C Section.

This section also is only partially outlined and is complicated by a granite overthrust and cross-faulting. It has been traced for a length of 1,000 feet and a depth of 400 feet. It is cut off to the west by faulting and may be open eastward. So far as is known it is not cut off at depth by granite.

Again there is insufficient information available to make tonnage calculations. Three parallel conglomerate beds carry values. Widths and grades are erratic; e.g. 0.097% U₃O₈/26.0', 0.09% / 2.7', 0.07% / 13.0', 0.101% / 7.3'.

#1 Zone.

This zone occurs in quartzites south of the #2 zone and apparently is a distinct horizon. It is characterized by high but spotty copper values. Little work has been done on this zone. Uranium values appear to be erratic and low.

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Thus, to 400-foot depth, the #2 and 3A zones are estimated

to contain 625,000 tons grading 0.095% U₃O₈. Assuming a minimum amount from 3B and 3C zones, there is indicated some 750,000 tons.

ECONOMIC CONSIDERATIONS

Various competent engineers have assessed the property and prepared estimates of the recoverable uranium, cost per ton, capital investment required, etc. Of necessity only the #2 and 3A section of #3 zone could be included in these calculations.

The recoverable uranium, after dilution and tailings loss, is estimated to be 1.55 pounds per ton. The government-guaranteed price for U₃O₈, including development allowance, etc., is \$7.25 per pound, for concentrates containing 10% U₃O₈ or better. In certain special cases where a leaching plant is constructed and high grade concentrates produced, special contracts have been let. No prices have been announced but it is generally believed to be \$10.00 to \$11.00 per pound. Thus, at \$7.25 per pound, the ore has a value of \$10.87 per ton for its uranium content; at \$10.50 per pound the value is \$16.27 per ton.

The Canadian Government purchasing agency has announced that no special contracts will be granted after 31st March, 1956. It is to be hoped that this policy will be changed. Meanwhile, unless the property can be developed to a position where a contract can be negotiated by that date, the lower figure of \$7.25 per pound of uranium must be used when placing a dollar value on the ore.

With the tonnage in sight in the #2 and 3A zones, a 500-ton per day operation is indicated. Mining and development costs for such an operation are estimated at \$6.00 per ton; milling costs at \$5.75 per ton; head office and administration \$0.75 per ton.

Total capital investment including pre-production expenses,

surface and mining plant, 500-ton leaching plant, inventory, working capital, etc., is variously estimated at \$6,166,000 to \$8,500,000. It is the present writer's opinion that the lower figure is more than ample. Plant write-off, interest and finance charges, etc. on this lower figure would total approximately \$6.00 per ton.

CONCLUSIONS

Estimated recoverable value of the uranium content of the New Thurbols ore is \$10.87 per ton, or \$16.27 if a special contract can be obtained.

Estimated cost of mining this ore at a rate of 500 tons per day, and producing a high grade uranium concentrate is \$18.50 per ton.

On the basis of these figures the project would operate at a loss.

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If a value can be attached to the thorium content of the ore the project might become profitable.

The writer is informed by competent metallurgists that the recovery of thorium in an acid uranium leaching plant is a relatively simple matter. By the addition of another circuit to the proposed plant, a high grade thorium concentrate as well as a uranium concentrate could be produced. Cost per ton would not be increased appreciably.

Assuming the lower price of \$7.25 for uranium, the thorium content of the ore should have a value of approximately \$10.00 per ton to assure a profit. From incomplete figures it is estimated

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that the ore contains 6 pounds of ThO_2 per ton. Thus, it is necessary to obtain \$1.50 to \$2.00 per pound of contained ThO_2 in the concentrate produced. This is somewhat higher than the market price for low-grade thorium concentrates, but may be obtainable in view of the fact that the product would be a high-grade concentrate.

Another factor to consider is that tonnages quoted above can be substantially increased if the thorium is saleable. Also further drilling on 3B and 3C zones should increase tonnage. Thus it may be possible to contemplate a 1,000-ton rather than a 500-ton operation, and reduce the cost per ton by perhaps 25%.

Respectfully submitted,

"L.G. PHELAN"

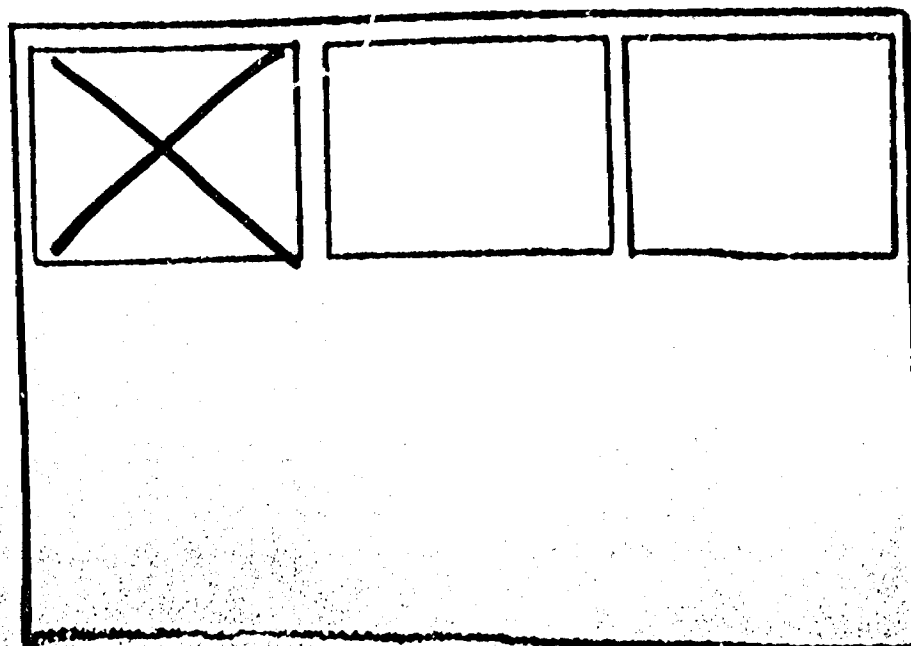
L.G. Phelan, M.A.Sc., P.Eng.

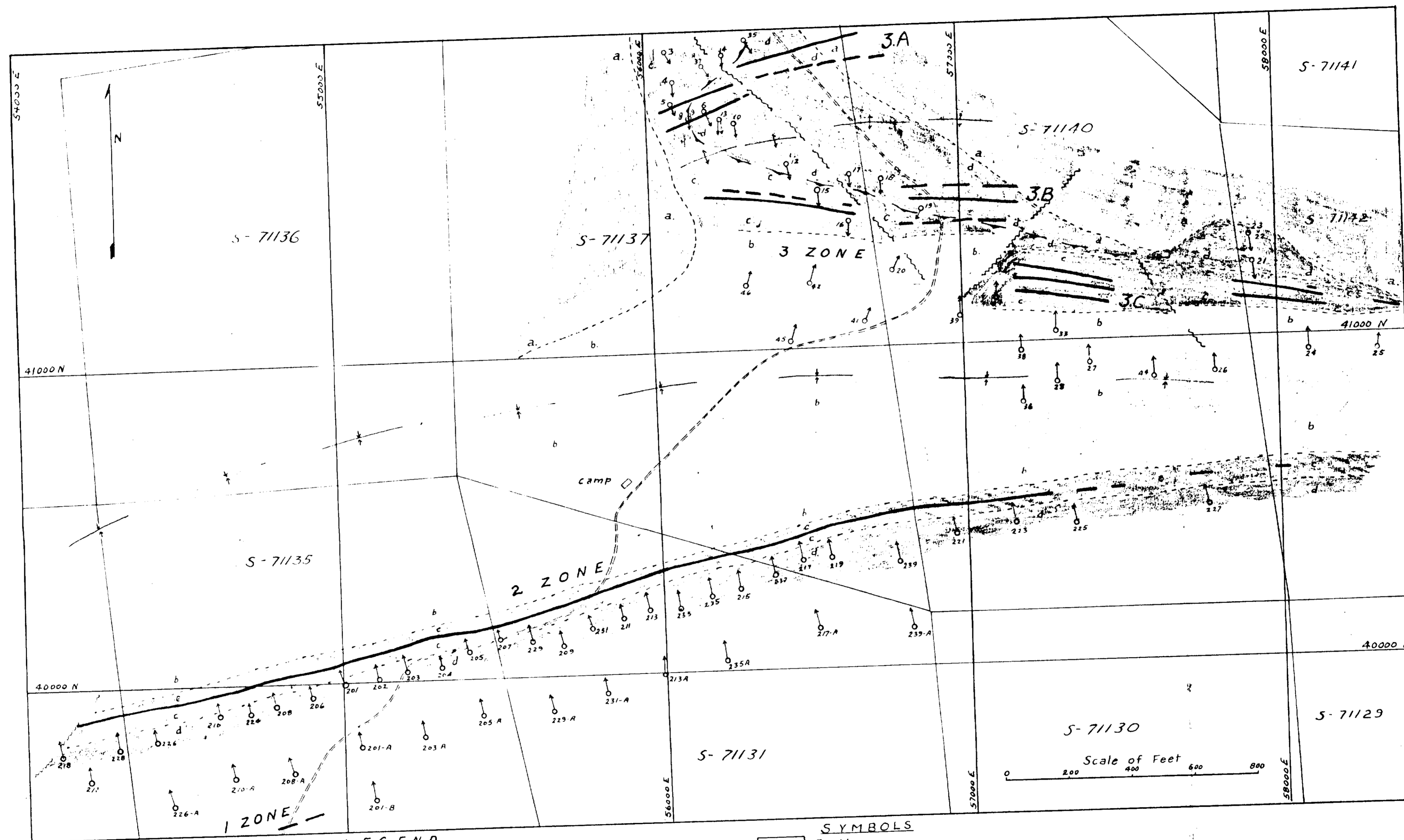
Dated at Toronto,

21st November, 1955.

SEE ACCOMPANYING
MAP(S) IDENTIFIED AS
HYMAN-0032-A1-F1

LOCATED IN THE MAP
CHANNEL IN THE FOLLOWING
SEQUENCE (X)





- LEGEND**
- a a Granite.
 - b b Argillite
 - c c Sericitic quartzite
 - [shaded] Uraniferous conglomerate
 - d [stippled] Greywacke

- SYMBOLS**
- Fault
 - ▲ Thrust fault.
 - ↕ Anticlinal axis.
 - ↕ Synclinal axis.
 - Road.

Fig 3 Diagrammatic sketch map of the geology and uranium-thorium occurrences on the property of Canadian Thorium Corporation, Ltd, in lots 5-6, concession V, (before annulment), Hyman township. (Modified after company plans by L.G. Phelan, Nov. 1955).

