

63.120

Report on the Geomagnetic Survey of the Property of

P. B. ZEVELY

Mann Township



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INTRODUCTION

Mr. Preston B. Zevely holds 6 claims in the northwest corner of Mann Township, Lots 11 and 12, Concession V1.

These claims lie about 12 miles south of Cochrane, Ontario. They are accessible by automobile and boat. A 7-mile drive south from Cochrane brings one to the Frederick House River, whence it is 7 miles upstream (south) to the Zevely claims. This river flows through the property.

The claims are numbered as follows: T-25903, T-25904, T-25914, T-26189, T-26190 and T-26191.

A geomagnetic survey was performed on this property between July 10th and 27th, 1947, under the direction of S. L. Spafford. Using an Askania vertical component magnetometer, duplicate measurements were made at 100 foot intervals along lines spaced 200 feet apart. Intermediate readings were taken where required to delineate certain strong anomalies.

GENERAL GEOLOGY

Little is known of the geology in Mann Township, which is largely covered with clay deposits. Only one map, No. 28b of the Ontario Bureau of Mines (1919), covers the area in any detail. It shows a few scattered outcrops of Keewatin lavas and sediments, intruded by masses of (Pre-Algoman?) serpentine, diabase and gabbro. Almost nothing is known of the major structures, although experience in this part of the Canadian Shield suggests that the volcanics and sediments are folded into a tight series of anticlines and synclines, having trends within 45° of east-west. These are intruded by later

igneous rocks with which mineralization is associated. Some of the more basic intrusives, however, such as the serpentized rock, may be pre-folding in age.

Magnetite is an abundant constituent of the serpentine, having developed during the metamorphism of peridotite or some other basic rock. Analysis has shown up to 14.68 per cent metallic iron in the serpentine, present chiefly in magnetite. The rock is, therefore, extremely magnetic and may be readily outlined by geomagnetic methods.

It has been observed that serpentine in the area also contains small quantities of pyrite, pyrrhotite and chalcopyrite, particularly along its contact with the greenstone.

The Alexo nickel deposit lies in serpentine some 19 miles to the southeast. The nickel occurs with both massive and disseminated pyrrhotite along the south contact of a serpentized intrusive, lying partly in the adjacent greenstone. The contact dips steeply north, so that the ore has a greenstone footwall and a serpentine hanging wall. High grade nickel ore was shipped from the Alexo for a number of years.

Chromium assays up to 8.46 per cent, and 0.066 ounces per ton of platinum have been recorded from serpentine in Réaume Township, adjoining the northwest corner of Mam Township.

It may be noted as an item of scientific interest that microscopic diamonds are present in the Reaume serpentine.

LOCAL GEOLOGY

On the Zevely property itself, two main rock types are recognized. The south portion appears to be underlain by a series of Keewatin volcanics, chiefly andesites, but with some rhyolite. The northern area consists

of a basic intrusive complex, commonly referred to as peridotite and serpentine. It probably includes other related varieties such as diorite, gabbro and dunite.

Just north of the contact zone, lying between the volcanics and the basic intrusive, a variable width of gabbro or diorite has been exposed in two places. This may be a late member of the basic series; it is chilled against the peridotite. The gabbro body narrows to the west, and reaches an unknown width to the east. The field evidence is meagre, however, and derived from few and scattered outcrops. Therefore the disposition and character of the gabbro is not reliably known - it may even consist of volcanic rock that has been recrystallized by heat and chemical action from the peridotitic magma.

Movement along the andesite-gabbro contact zone is evidenced by shearing and fracturing, and by the fact that the actual contact lies, for most of its length, beneath a gully. This gully strikes about southeast by east across the central part of the property.

Fractures appear at places in the andesite, south of the contact zone. These commonly contain quartz and carbonate, with some associated iron and copper sulphides. Similar veins and mineralization occur in parts of the gabbro, particularly where it approaches the river. Recent work has exposed a whole network of branching veins of this type, in some respects a "stockwork".

Scattered chromite occurs in the same vicinity, in the serpentinized peridotite lying just north of the gabbro.

Magnetite is locally quite abundant in the serpentine and peridotite; its distribution is apt to be very haphazard.

GEOPHYSICAL RESULTS

The accompanying map gives the contoured results of the geomagnetic survey. A number of general characteristics should be noted:

Readings over the serpentine are very high, and are grouped into zones of different intensities. These may be due partly to magnetic segregation and consequent accumulation of magnetic bands in the original basic rock, a feature known to occur elsewhere in the district. It must be remembered also that values over such a magnetic rock are governed largely by the topography and depth of overburden. On the Zevely property, the serpentine areas are quite hilly, and the overburden is relatively shallow.

The serpentine-greenstone contacts are commonly marked by extreme magnetic lows, especially on the south side of the serpentine. A southward dip is thereby indicated.

The greenstone gives relatively low magnetic values of a rather uniform nature. The uniformity is to be expected, since this part of the property is covered by a fair thickness of overburden (spruce swamp).

Magnetic lows appear to be due chiefly to contacts as previously stated. However, a prominent low area near the middle of the south boundary of Claim T-26189 requires additional interpretation. It can be traced in various degrees of intensity across the entire property in a direction 25° east of north. The lineation suggests faulting or acid dike intrusion; the former is more probable. As before, this low occurs at the serpentine-greenstone contact.

GEOLOGICAL INTERPRETATION

The interpreted rock contacts are shown on the map.

In general, most of the north half of the Zevely property is underlain by serpentine. Its contact with the greenstone dips south, following a sinuous course which averages some 20 or 30 degrees south of east.

Near the centre of the property a large finger of greenstone has been nearly surrounded by the basic intrusive. It was traced geomagnetically for over 1600 feet to the west-northwest. The gabbroic rock already referred

to may be a part of this greenstone recrystallized.

South of the greenstone remnant a long narrow anomaly is considered due to the invading serpentized peridotite. This dike probably connects with the main mass at depth and to the west.

Near the northwest corner of the property the contact swings west, then south, and finally strikes somewhat east of south until it leaves the property at the south boundary. This contact may be vertical or steeply dipping to the west.

The volcanics must be quite uniform in composition. However, alteration and recrystallization may be expected parallel to the intrusive; this is supported by the magnetic results.

A probable fault zone in the easternmost two claims has been suggested. It is post-serpentine in age, and may have had no part in the movement of solutions related to the basic intrusive.

Small veins of quartz and carbonate, together with pyrite and chalcopyrite, are likely genetically related to the serpentine body. Even such a basic magma as gave rise to this rock is capable of producing quartz-rich solutions at a late stage.

CONCLUSIONS

Peridotite and its related rocks frequently have associated with them deposits of nickel, chromium, copper, iron and platinum, either singly or in association. Conditions on the Zevely claims are such that chromium and copper in particular, and perhaps nickel, should be sought in commercial quantities. The presence of possible ore is indicated by chromite in the peridotite and by copper in the quartz-carbonate veins. The nearby

Alexo nickel mine, in an intrusive of the Zevely type, shows the good chances of finding nickel. It might be noted that the quartz-carbonate veins, while important indicators, are probably of no economic value in themselves. Their presence should be interpreted as proof positive that ore solutions have been active in the vicinity.

All the metals mentioned above occur usually with magnetic mineralization, or are magnetic in themselves. Thus magnetic anomalies should be examined in any future exploration. These anomalies will be located either within the serpentine, along its contacts, or in fractures in either the serpentine or its host rock.

In selecting promising anomalies, those due to shallow overburden above the serpentine must be eliminated. We regard the "highs" around 1200E, 600N and in the extreme southwest corner of the property as examples of such. Our recommendations are based on interpretation of the remaining anomalies.

RECOMMENDATIONS

In view of the overburden, diamond drilling of certain anomalies, is recommended. The four holes listed below, totalling 2400 feet are of an exploratory nature; that is, even if ore is not cut, the results should be of great assistance in further and more accurate interpretation of the geophysical data. However, it is believed that ore, if it is present, will be indicated in one or more of the drill cores.

D.D.H. # 1

Collar:	2700' E, 500' S
Direction:	Due North
Dip:	45°
Slope Length:	600'
Projected Length:	425'

D.D.H. # 2

Collar:	2200' E, 200' N
Direction:	Due North
Dip:	45°
Slope Length:	700'
Projected Length:	500'

D.D.H. # 3

Collar:	400' E, 700' N
Direction:	N 20° E
Dip:	45°
Slope Length:	450'
Projected Length:	320'

D.D.H. # 4

Collar:	3600' E, 500' N
Direction:	Due East
Dip:	45°
Slope Length :	650'
Projected Length:	460'

If the results from these holes are at all promising, the remaining anomalies should be similarly tested, and additional drilling on the anomalies already intersected should be carried out.

Respectfully submitted,

MINING GEOPHYSICS CORPORATION LIMITED



H. S. Scott
Geologist

Toronto,
August 25th, 1947.



N. B. Keevil
Geologist and Geophysicist.

APPENDIX

Property: Preston B. Zevely, situated in the North-West corner of Township of Mann, Temiskaming Mining Division, Province of Ontario, comprising 6 claims, viz: T-25903, T-25904, T-25914, T-26189, T-26190 and T-26191.

Dates of Survey:

Linecutting - 2 men - July 10 - July 22, 1947 ³⁹ - 24 man days }
 Magnetic measurements, chaining, etc. 2 men - July 10 - July 27, 1947 ²⁴ - 34 man days }
 Calculating, plotting, interpretation, mapping, etc. 3 men - August 8 - 25, 1947 - 22 man days }
 (intermittently)
 80 man days

Baseline: Runs N 88° E from Post # 3 of Claim T-25904 for a distance of 4071 feet.

Picket Lines: Turned off at right angles to baseline at 200 ft. intervals.

Miles of Line: Eleven (11)

Operator: S. L. Spafford

Assistant: Raymond Groulx

Linecutting: Tom Morden and W. E. Osmun

Draughtsman: R. L. Hill

Instrument Used: Askania type magnetometer

Sensitivity: 28.01

Main Base: 00 on baseline

Number of Magnetic Measurements: 687.

LOT 12
LOT 11

Geological Interpretation & Geomagnetic Contour Map

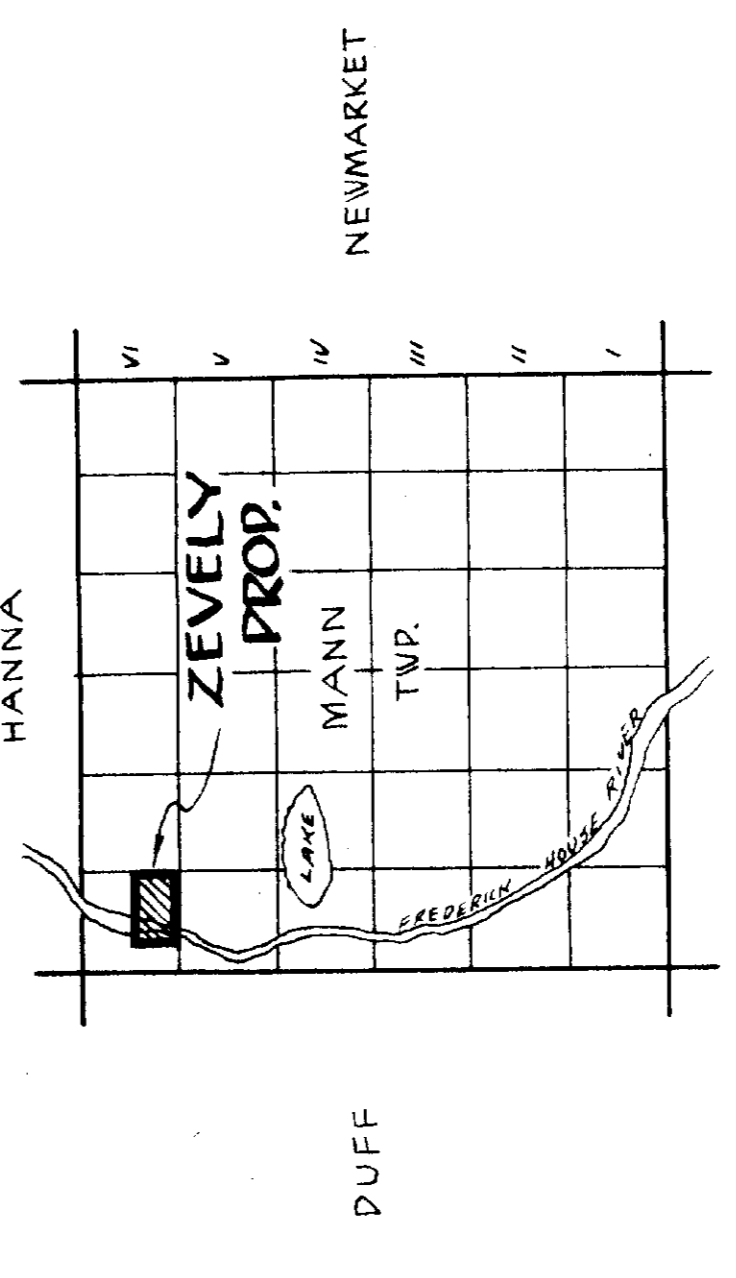
PROPERTY OF

P.B. ZEVELY

Mann Twp. - Temiskaming Mining Div. - ORPENO
Scale 1:100,000

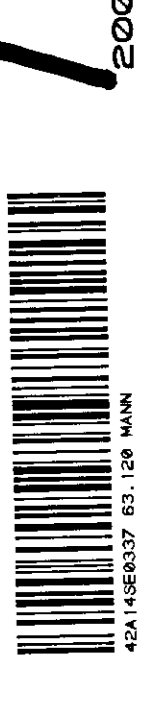
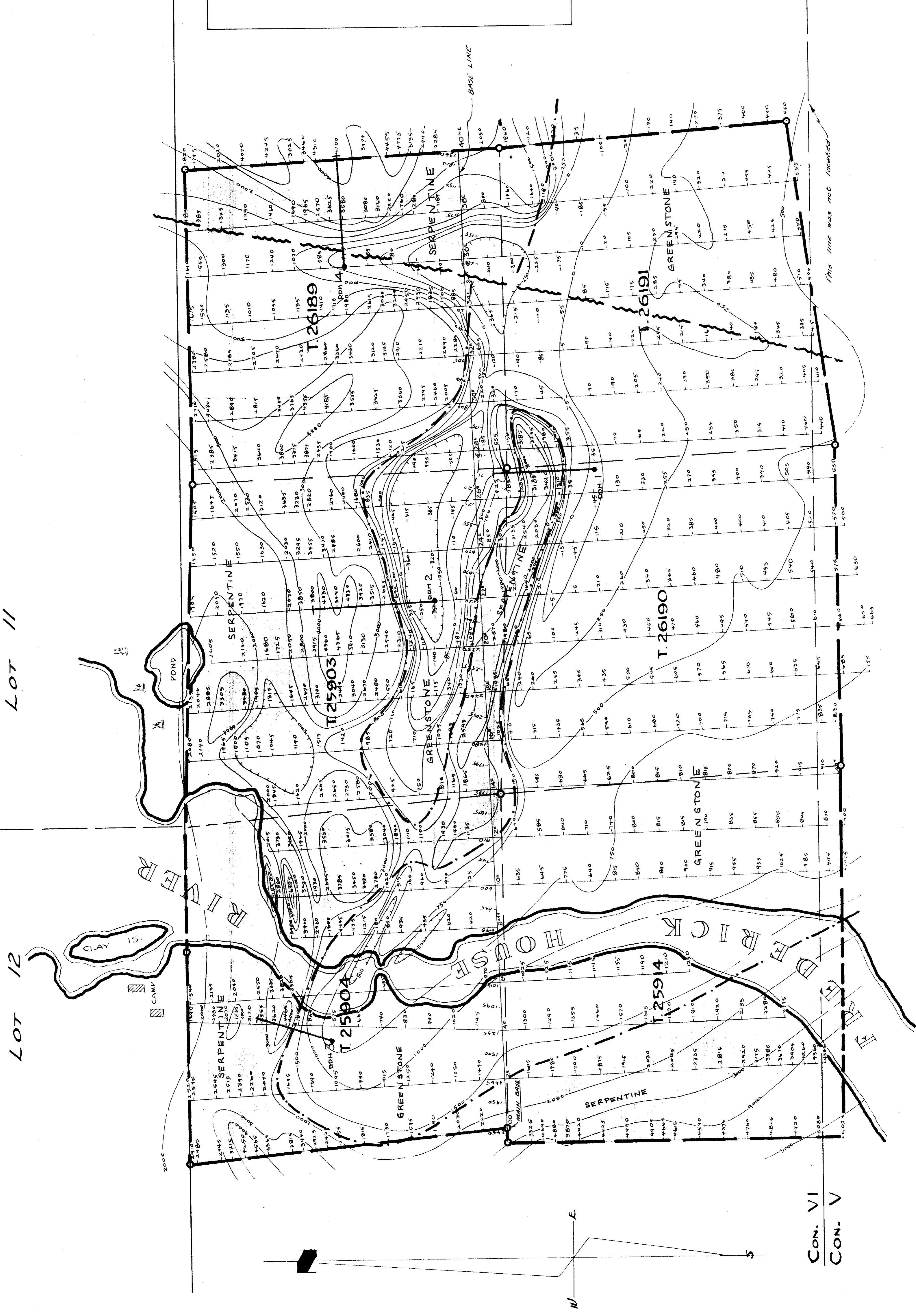
Legend:

- Serpentine
- Greenstone
- Interpreted geological contact
- Interpreted fault
- Proposed diamond drill hole



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19 MELINDA ST. - TORONTO

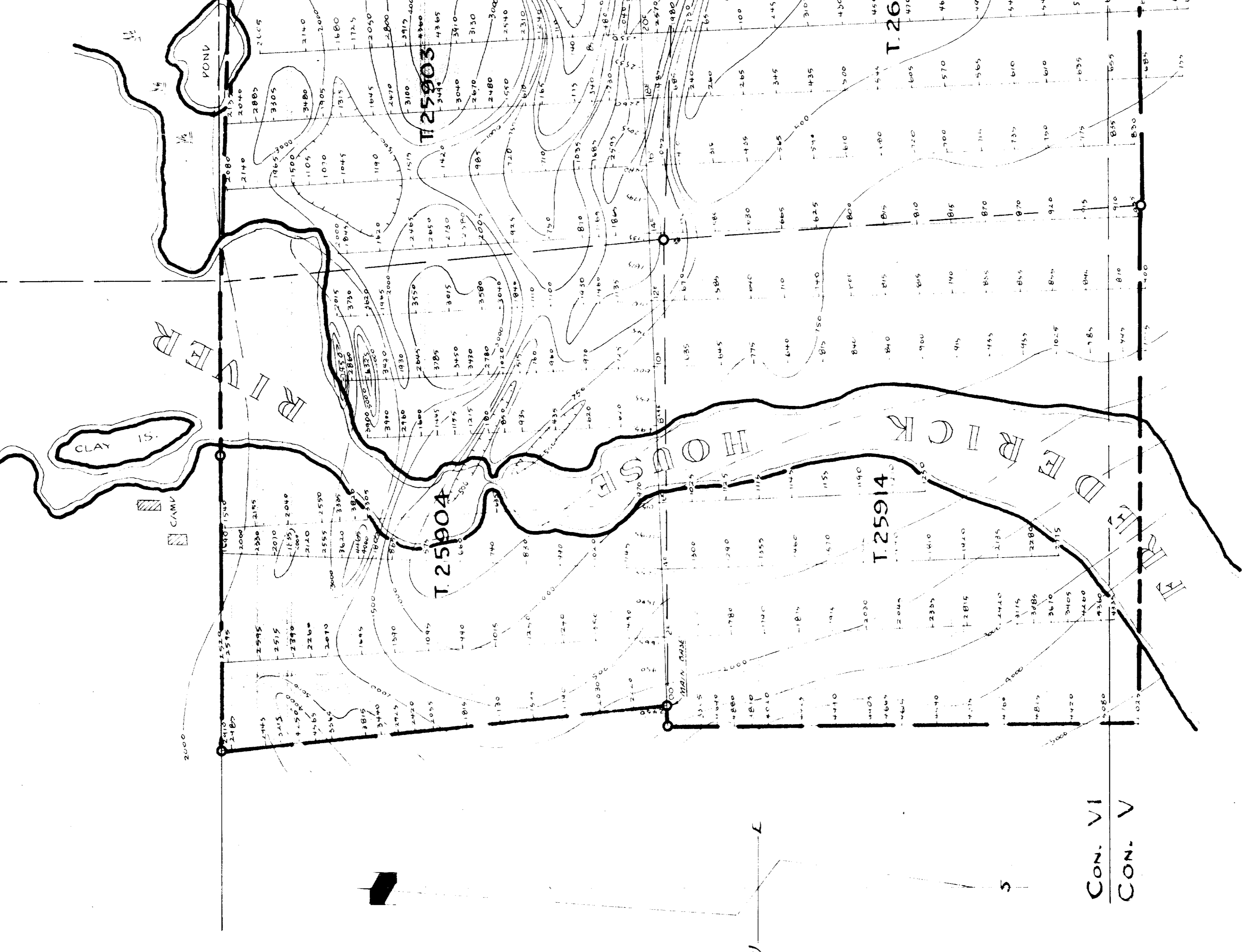
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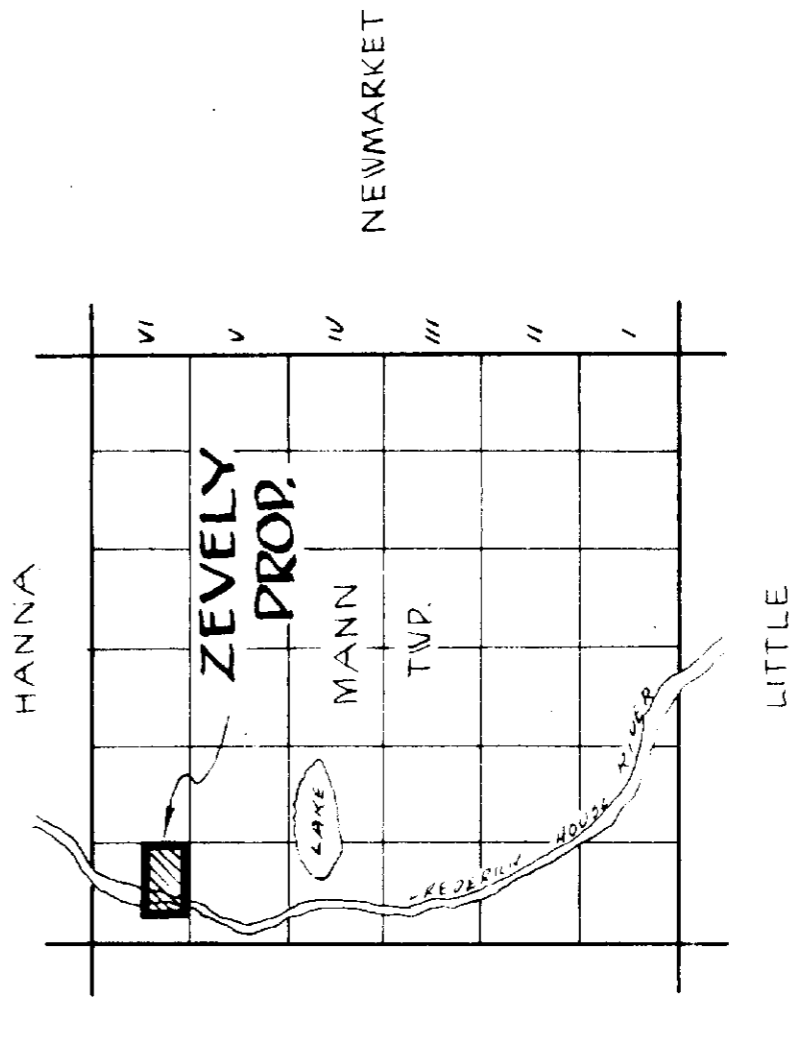
LOT 12

LOT 11



Georginae Conour Map
PROPERTY OF
P.B. ZEVELY
 Main Twp - Temiskaming Mining Div - Ontario
 Scale 1:147,200 etc

Legend
 [White Box] High magnetic intensity
 [Grey Box] Low magnetic intensity



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DRAFTED BY: [Signature]
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 DATE: 12-8-47
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