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Report on a Loop Frame EM
Survey for Cygnus Exploration Corp. Ltd.
Idington Twp.
1957

63.960

MOREAU, WOODARD & COMPANY LTD.

GEOPHYSICAL & GEOLOGICAL SURVEYS

INTRODUCTION

A Loop-Frame electromagnetic survey was carried out for Cyprus Exploration Corporation Ltd. on Ranges XVI and XVII and on portions of Range XVIII in Idington Township, Ontario during March and April 1957.

The purpose of this survey was to outline sub-surface conductors which might prove to be sulphide bodies of economic importance. Numerous conductors were located. The accompanying map in 2 parts shows the area surveyed and the results obtained.

METHOD AND INTERPRETATION OF RESULTS

The Loop-Frame electromagnetic equipment with a frequency of 3600 cycles per second was used for this survey. Readings were taken at 100 foot intervals along previously cut lines. Over anomalous areas readings were taken at 50 foot intervals. The distance between the receiving and transmitting coils was maintained at 200 feet.

The in-phase and the out-of-phase components of the vertical secondary field were measured and are expressed directly in percentage change from a normal field.

The typical curve obtained over a steeply dipping conductor shows a rise (positive) when approaching the conductor, followed by a low (negative-greater than 5%) when the conductor is between the coils. A second rise occurs when both coils are beyond the conductor. Both the in-phase and out-of-phase readings usually show the same general curve. The ratio of the two components indicates the relative conductivity of the conductor.

A ratio of $\frac{\text{in-phase}}{\text{out-of-phase}}$ readings greater than 4 indicates a high conductivity, typical of sulphide zones. Ratios around unity indicate a relatively low conductivity, typical of graphitic zones. Ratios around 0.4 and lower are not uncommon over swamps and on lakes near the shore lines. As graphite is often a poorer conductor than sulphides, the ratios of the readings often help to indicate the nature of the conductor.

Relatively deep, mildly conductive overburden, commonly found on lake bottoms, causes higher than normal positive in-phase readings while affecting the out-of-phase component to a lesser degree.

The intensity of the readings over a conductor is dependent on the depth of overburden and on the size, shape, attitude and composition of the conductor.

RESULTS

Numerous long conductors up to a mile in length and up to 200 feet in apparent width were located from one end of the property to the other. The conductors generally strike east-west. The indicated wide conductors are probably composed of several narrow closely spaced parallel conductors which produce the same effect as one wide conductor. The conductors grade continuously from strong conductors with high ratios right down to very weak conductors with low ratios.

The most important conductors are discussed below:

A long, strong conductor extends from section 60 to 102 where it strikes off the north boundary of the property. There is up to a 38% change in the in-phase readings with most ratios between 5 and 6, suggestive of sulphides. On section 87, 2,150 feet

north of the base line the conductor has an apparent width of 200 feet.

A strong conductor was located on sections 60, 63 and 66, 700feet south of the base line where it has an apparent width up to 160 feet. The in-phase readings go down to -50 with ratios around 5.

A long conductor was located near the west end of the property, north of the base line. Some sections show quite high conductivity with a -37 in-phase reading and a ratio of around 6 on section 435, 575 feet north of the base line.

On section 381, 3,725 feet north of the base line a conductor shows a -57% change in the in-phase readings with only about a 2 ratio. This conductor is not too suggestive of sulphides although it produced very strong effects.

A moderately strong conductor was located on section 444, 3,625 feet north of the base line. The in-phase readings go down to -41 with about a 2.5 ratio. This conductor extends to the west limit of the area surveyed where it is still quite strong on section 453.

On section 435, 575 feet north of the base line a very short conductor was located on this line only. It has a -29 in-phase reading with a ratio of 4. This conductor might prove interesting as there is a chance that it contains different conductive material from the long conductors.

There are several moderately strong conductors with in-phase readings between -20 and -30 and ratios between 4 and 5. These are quite significant conductors which probably contain some sulphides.

It is noteworthy that many of the conductors have readings of similar strength and have similar ratios over most of their length. This would suggest that the conductive material occurs in about the same percentage along the length of the conductor. It follows that a conductor probably would be adequately tested with only one drill hole.

RECOMMENDATIONS

Initial drilling is recommended on the first two conductors discussed above on the sections with the greatest widths. If the results are not encouraging others methods should be investigated as to their practibility, such as geochemical tests, in testing the remaining strong conductors.

MCREAU, WOODARD & COMPANY LIMITED

J. A. Woodard P. Eng.

J. A. Woodard

JAW/jw

May 23/57

CYPRUS EXPLORATION CORPORATION LIMITED

SUITE 802
80 RICHMOND ST
TORONTO
EMPIRE 6-62

020

REPORT ON THE OPASATIKA PROJECT

Location:

The property is located in Idington Township, Ontario, about five miles north of Opasatika station on the main line of the Canadian National Railroad. Opasatika is twenty-five miles west of the town of Kapuskasing.

Access:

In summer the only means of access is by boat down the Opasatika River or by canoe down Lost River and then up Hull Creek which meanders through the eastern part of the property. Numerous short portages are necessary for the first four miles on Hull Creek.

In winter bush roads may be used. The locations of such roads are shown on the accompanying sketch.

Ownership:

Cyprus Exploration Corp. has staked or optioned the following lands:

Idington Township
- Range XVIII, all lots 16 to 28 inclusive.
- Range XVIII, south half lots 1 and 2.
- Range XVII , all lots 1 to 28 inclusive.
- Range XVI , all lots 1 to 27 inclusive.
- Range XV , north half lot 1.

Williamson Township
- Range XVII, all lots 25 to 29 inclusive.
- Range XVI , all lots 25 to 29 inclusive.
- Range XV , north half lots 25 to 29 inclusive.

Previous Work:

Chained picket lines running north-south have been cut every three hundred feet in accordance with the plan submitted by Jean Alix Co. of Val D'Or, Quebec.

In addition a ground electro-magnetic survey was completed on behalf of Cyprus by Moreau, Woodard and Co. Ltd., over these cut lines

Present Work:

A geological survey was initiated to map the rock types and to determine the causes of the numerous electro-magnetic anomalies. The cut lines were used as a control grid for the mapping. Accompanying this report is a small scale map (one inch equals 5700 feet approx.) drawn in part from uncorrected aerial photographs. Since only two rock exposures are present on the property the scale is considered suitable.

Topography and Vegetation:

The terrain is flat, low lying, and monotonous in character. Rivers are incised only a few feet below the gereral ground level and are as a result meandering with a sluggish current.

A mixed growth of poplar and spruce is found in areas that rise a few feet above the general ground level, due to better drainage. All growth of this type is aligned in a northeasterly direction indicating a relationship to the direction of ice movement during the pleistocene glaciation.

Scrub spruce, alder, and muskeg cover much of the property in about the same proportion as well developed spruce forest growth.

The various types of vegetation are indicated on the sketch map.

Geology:

On the property itself only one rock exposure was noted. Grey foliated gneiss occurs 3100 feet north of the baseline between lines 369 and 372. Iron formation is found with the gneiss. If typical, this material indicates that the iron formation in the area is bandedand composed of quartz with hematite. Thin magnetite rich interbands are sometimes present. The strike of the formation is 78° and the dip 32° north.

Grey foliated gneiss was again noted west of the property limits in range XVIII. It occurs also on Lost River about three miles north of Highway II.

Boulders are common along parts of Hull Creek. Grey gneiss, amphibolite, and buff dolomite predominate. The dolomite belongs to the Palaeozoics fringing James Bay and reached its present position due to glaciation.

Analysis of Electro-Magnetic Anomalies

In the absence of suitable rock exposures the causes of the anomalies cannot be deduced directly. All anomalies were covered by dip needle todetermine if there was a magnetic response. A high E.-M. ratio with a good in-phase response indicates sulphides in ninety percent of the cases where coupled with a magnetic response over the same anomaly.

The accompanying chart indicates our interpretation of the various anomalies.

Analysis of Electro-Magnetic Anomalies

Line	Position	E.-M. Ratio	Response	Dip Needle	Interpretation	Recommendation
444	3625N	2.8	-4I	non mag.	Iron Form.	
444	600S	2	-38	non mag.	I.F.	
435	575N	6	-37	-2	I.F.with pyrite?	
38I	3725N	2	-37	-3max.	I.F.with pyrite? Known I.F. nearby	drill
366	2420S	4	-29	non mag.	unknown	drill
363	500N	I-3	-I8	non mag.	graphite?	
336	2050S	I-I.5	-I3	non mag.	weak extension 366	
330	3700N	I	-I5	non mag.	overburden	
312	3800N	4	-35	-3	unknown	drill
312	I400N	3-6	-33	non mag.	unknown, graphite?	
288	800N	2.5-3	-26	non mag.	I.F.?	
267	2200N	I.5-2.5	-I4	non mag.	I.F.?	
261	II00N	2.5	-20	non mag.	I.F.? overburden?	
I98	I650N	I.5-3	-26	- -8	extension to east non magnetic I.F. with sulphides?	drill
84	900N	I	-I5	non mag.	overburden?	
84	[illegible]	5-6	-37	-I8	sulphides, 200 feet wide acc. to dip needle	drill
60	700S	5	-50	-50	sulphides, I60 feet apparent width dipneedle	drill
63	I620N	2.8	-22	-4	I.F.?with sulphides?	drill

Other minor anomalies to the east are of no interest.

Conclusions:

Rock crops out at only one locality on the property. This exposure of grey gneiss and iron formation indicates that the regional strike is east-west, the dip steeply north.

Areas of higher ground trending northeasterly bear no relationship to the anomalies or to the underlying rock types, being of glacial origin.

All anomalies are covered by overburden of uncertain depth. Certain of these anomalies are considered worth drilling as indicated on the above chart.

Recommendations:

It is recommended that 9 diamond drill holes totalling 2520 feet of "E" core be used to test the most important geophysical anomalies. A reserve of 480 feet of core should be allowed to cover holes that are drilled deeper than original estimates. The positions of these drill holes on the following chart and have been plotted on the geophysical map. All holes should be drilled southerly to cross what is beleived to be the regional dip.

Drilling Considerations

In all cases examined the ground was too soft for summer drilling and access would be very difficult. A winter drilling program is therefore recommended.

It will be necessary to cut roads to the various drill sites. Spruce trees of suitable height and diameter are available for tripod legs near all drill locations

Boats of the Spruce Falls Pulp and Paper Co. cease operations on the Opasatika River about Nov. 10 each year. Freezeup may be expected about that date.

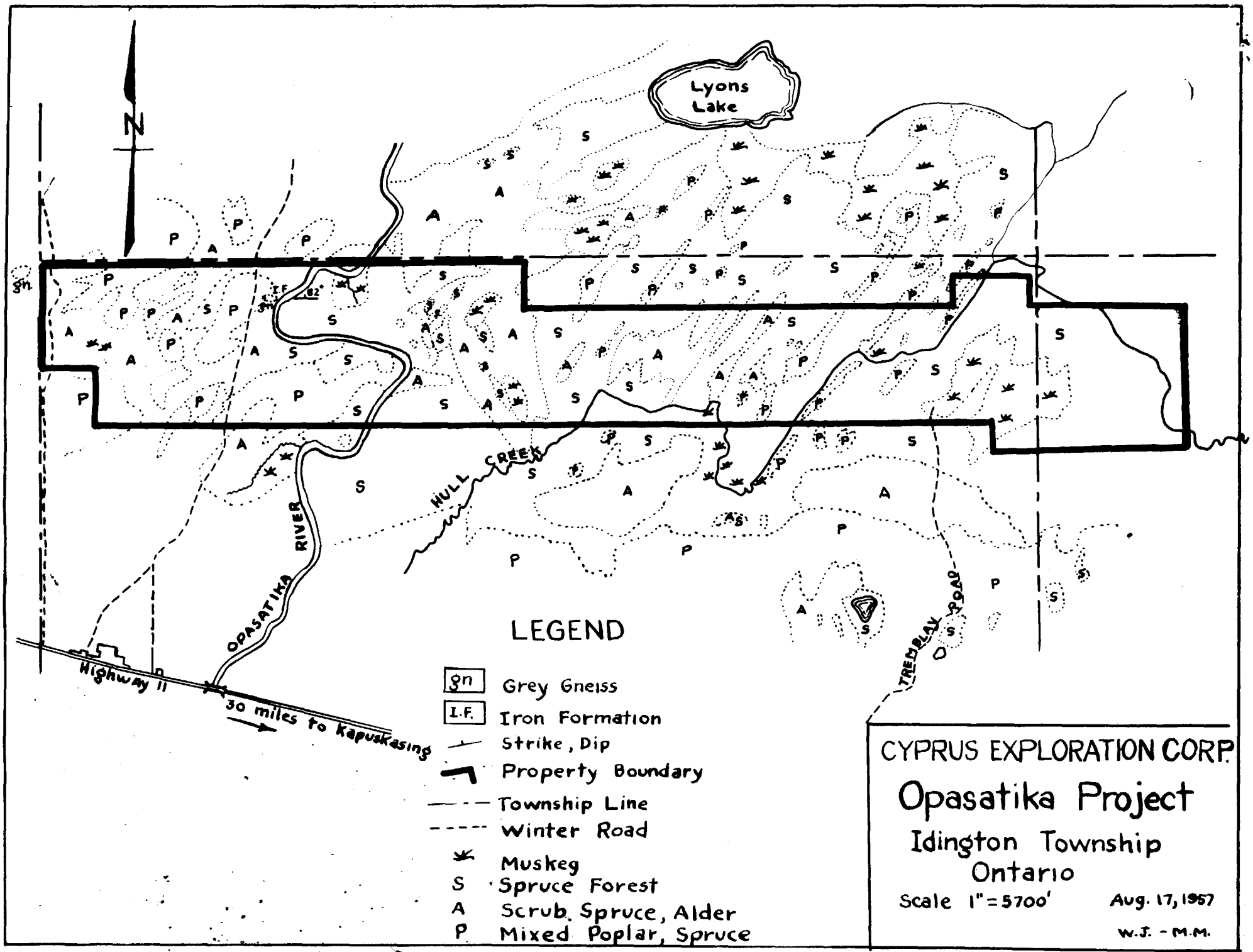
Prior to the first snowfall it is recommended that the locations of all holes be well marked in paint and that lines of access be similarly marked, since last winters line cutting is difficult to follow.

Summary of Proposed Diamond Drilling

Hole No.	Section No.	Collar (ft. from B.L.)	Dip & Bear.	Length of hole	Distance to water
1	51	535 S	-50° S	220'	1100' N
2	60	550 S	" "	335'	1000' N
3	63	1620 N	" "	220'	1100' S
4	84	2240 N	" "	335'	1700' S
5	90	2365 N	" "	415'	2400' S
6	198	1725 N	" "	220'	3100' S
7	309	3950 N	" "	220'	1600' NW
8	366	2355 S	" "	220'	3800' N15E
9	384	3835 N	" "	335'	2000' SW
				2520'	

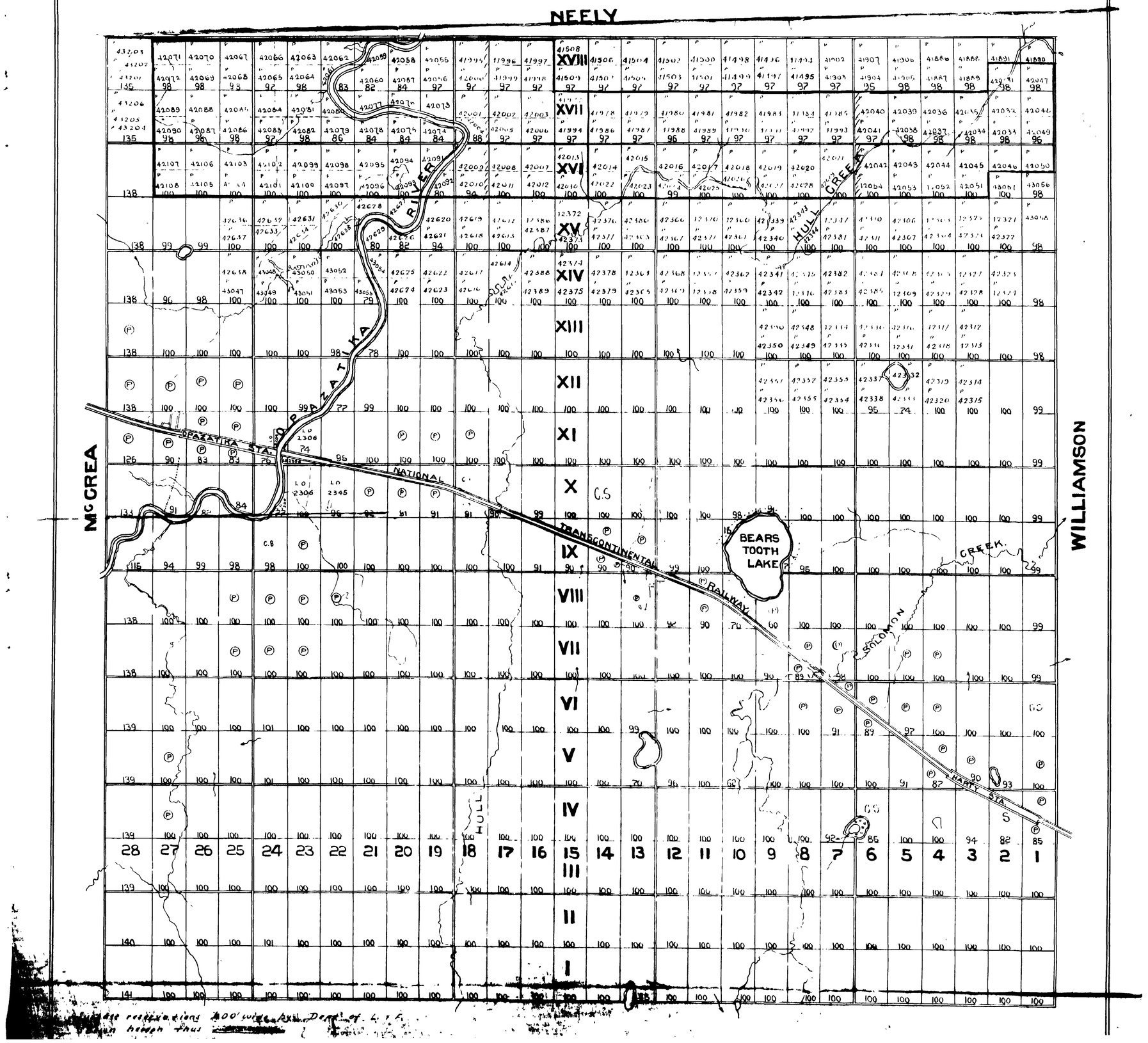
The positioning of collars allows for 100' of overburden. The above drilling footage estimate leaves 480' (of a 3000' drilling contract) unassigned, to be used as indicated by future drilling results.

W.H. Jackson M.J. Mloszewski August 22, 1957.


N
Lyons Lake
gn
I.F.
82°
HULL CREEK
OPASATIKA RIVER
Highway 11
30 miles to Kapuskasing
TREMBLAY ROAD
LEGEND
gn Grey Gneiss
I.F. Iron Formation
Strike, Dip
Property Boundary
Township Line
Winter Road
Muskeg
S Spruce Forest
A Scrub Spruce, Alder
P Mixed Poplar, Spruce
CYPRUS EXPLORATION CORP.
Opasatika Project
Idington Township
Ontario
Scale 1" = 5700'
Aug. 17, 1957
W.J. - M.M.

IDINGTON

PORCUPINE MINING DIVISION



Passage restrictions 400' wide, Dept. of L. & F.
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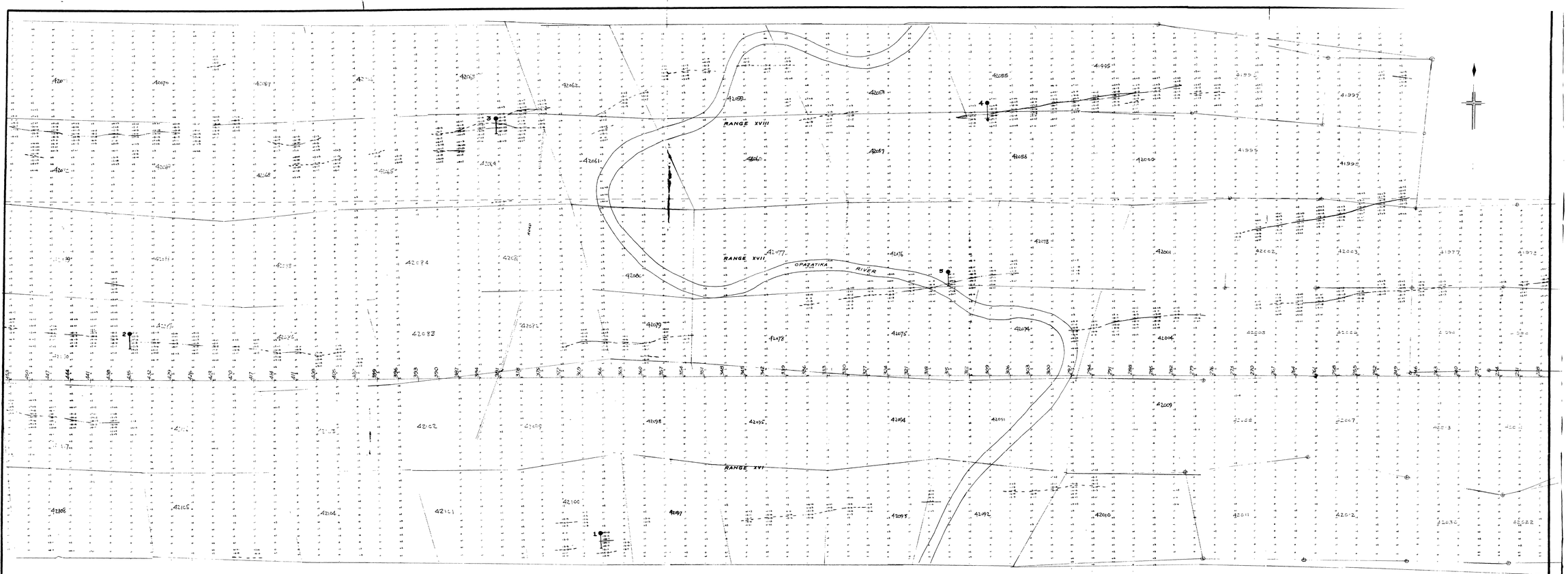

Diamond Drill Hole

CONDUCTOR
WEAK CONDUCTOR
IN-PHASE COMPONENT READINGS . . . . . LEFT
OUT-OF-PHASE COMPONENT READINGS . . . . . RIGHT

J.A. WOODARD REGISTERED

LOOP-FRAME ELECTROMAGNETIC SURVEY
FOR
MOREAU, WOODARD & CO. LTD.
FOR
CYPRUS EXPLORATION CORPORATION LTD.
OPAZATIKA PROJECT
IDINGTON TWP., ONT.
SCALE: 1 INCH = 400 FEET

DRAWN BY: J.W.
DATE: MAY, 1957.

W-2-W

Diamond Drill Hole.

CONDUCTOR
WEAK CONDUCTOR
IN-PHASE COMPONENT READINGS . . . . LEFT
OUT-OF-PHASE COMPONENT READINGS . (WHEN SIGNIFICANT) . RIGHT

PROVINCE OF CANADA
J. A. WOODARD
REGISTERED ENGINEER

LOOP-FRAME ELECTROMAGNETIC SURVEY
BY
MOREAU, WOODARD & CO. LTD.
FOR
CYPRUS EXPLORATION CORPORATION LTD.
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IDINGTON TWP., ONT.
SCALE: 1 INCH = 400 FEET

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DATE: MAY, 1957.

W-2-E