REPORT ON GEOPHYSICS & GEOLOGY JAMIESON TWP. 1959

for

NEW KELORE MINES

BY

GEOTECHNICAL DEV. CO LTD.
(S.S. Szetu)

CONTENTS

New Kelore Mines Ltd.,
Suites 403-5,
67 Yonge Street,
TORONTO, 1.

Gentlemen:

This report describes the results of an electrical resistivity survey and an electromagnetic check survey conducted by Geo-Technical Development Company Limited on your property located in Jamieson Township, Timmins Area, District of Cochrane, Ontario. The survey was carried out during August and September, 1959, and the results are depicted on Plan No. 1 accompanying this report.

CONCLUSIONS AND RECOMMENDATIONS

The survey has outlined five comparatively low resistivity zones on the property. These are identified as "A", "B", "C", "D" and "E", and are interpreted as fault or shear zones in Keewatin volcanics. One of the resistivity anomalies in these zones is an electromagnetic conductor, and coincided with sulphide mineralization outlined by previous exploration drilling. The electrical resistivity survey obtained indication of the eastern extension of the favourable structure which carried the mineralization. Choice anomalies outlined along this zone and along all other anomalous zones do not have appreciable electromagnetic conduction. Also, no appreciable electrical conductivity or electromagnetic conduction has been encountered over any of the magnetic anomalies outlined by previous survey.

It is concluded that some favourable structures have been outlined by the electrical resistivity survey, however, there is no indication of any appreciable conductive sulphide mineralization at near-surface conditions.

It follows that exploration diamond drilling, if desired, is primarily for the purpose of testing geological structure and the possibility of having mineralization other than massive sulphides associated with the structure. Results obtained from such drilling may help to justify the theory of having better mineralization at great depth.

Seven choice locations for such purpose are depicted on Plan No. 1 accompanying this report. The first four holes would be sufficient to test the possibility of having the eastern extension of the mineralized structure encountered by previous diamond drilling.

The total core length of these four holes is 1800 feet.

PROPERTY, LOCATION AND ACCESS

The property is comprised of twenty-five (25) claims identified as follows:

12344 and 12350
25758 - 25765 inclusive
45700 - 45711 inclusive
45697 - 45699 inclusive.

all located in Jamieson Township, Timmins Area, Ontario. The claims consist of Lots 10, 11 and 12 of Concession IV and the southwest quarter lot of 12, West Half, Concession V.

The west boundary of the property is only about 1,000 feet east of the pit of Kam-Kotia Porcupine Mines Ltd., which was a copper producer in 1943-1944 and recently has resumed development. The road built at that time now affords a convenient means of access. The distance from the Town of Timmins to the property is approximately 20 miles.

GENERAL GEOLOGY

The geology of the area is on Map No. 53c, by L. G. Berry and S. A. Ferguson, and the geology of the vicinity of Kam-Kotia Mine was by S. A. Ferguson (Vol. LIII, Part IV, 1944, Ontario Dept. of Mines).

The area of the property is completely blanketed by overburden, except for two relatively small outcrop areas of Keewatin volcanics in Lot 11, Concession IV.

According to Berry, the location of the property is on a Keewatin greenstone belt which forms part of the southwest limb of a major syncline. This syncline trends northwest-southeast, and plunges southeast. All observations of pillow shapes indicate that the tops of the flows are to the northeast. Schistosity developed in these rocks strikes N. 65° - 85°W. A large area of gabbro is located

in the southwest part of Kamiskotia Lake, and immediate vicinity. The assumed Keewatin-Gabbro contact is also northwest-southeast.

Several small bosses of granite are located in the western half of the map area. One small outcrop of these is indicated near the western boundary of the property. A more detailed map by Ferguson (quoted), however, did not indicate the occurrence of this granite at this location.

In addition, results of 10 holes in Claim 12350 were made available to the writer. These holes did not cut granite, but intersected copper mineralization in sheared andesite and rhyolite, and at the contacts of the two. Interfingering of these lavas has been observed at the neighbouring Kam-Kotia Mine. The contact between the two is sheared everywhere. Underground observations indicate that the massive sulphide zones contact the country rock along faults, although no evidence of faulting was observed on surface. The known ore body is described as, in part, a massive replacement in a sheared and faulted zone, and, in part, a stockwork deposit. The fault zone is believed to have provided a channel for the migration of solution from depth.

Another outstanding geological feature in the area is the numerous Matachewan quartz-diabase dikes which run approximately north-south through all the rock formations mentioned above.

SURVEY RESULTS

Results of the electrical resistivity survey and electromagnetic check survey are depicted on Plan No. 1 accompanying this report. Magnetic contours based on data obtained by Koulomzine, Geoffroy and Co. (1955) made available to us, are given on the same plan, for the purpose of better interpretation.

The resistivity survey has outlined several weak anomalous zones on the property. The more interesting ones are lettered "A" to "E" inclusive on Plan No. 1.

Anomaly "A" is outlined at the west boundary of the property in Claim 12350. It registered a low reading in the order of 600 ohm-cm. x 10^3, with contrasts of up to 10 times lower than its neighbouring readings. Electromagnetic check work traced a conductor of approximately 600 feet in length on the property, open to the west. This anomaly has been drilled and shown to be caused by sulphide mineralization with copper values.

Anomaly "A-1" outlined in Claim 45698 is interpreted as the probable eastern continuation of "A", but cut off by two diabase dikes and one cross-fault of later age. This anomaly has "lows" in the order of 700-800 ohm-cm. x 10^3, but without appreciable contrasts to neighbouring readings. Electromagnetic check work using vertical and horizontal loop instruments, has not encountered any indication of appreciable conduction.

Anomalous Zone "B" is located 600 to 1,000 feet northeast of and parallel to "A". "Lows" here are in the order of 700 to 900 ohm-cm. x 10^3, and without appreciable contrasts to neighbouring readings. Electromagnetic check work has encountered two marginal "cross-overs" along the zone, one at "B" and one at "B-2".

Anomalous Zone "C" is a small anomaly outlined in Claims 45705 and 45704. "Lows" here are in the order of 700 to 800 ohm-cm. x 10^3, and without appreciable contrasts to neighbouring readings. High readings of over 10,000 ohm-cm. x 10^3 have been encountered at about 700 feet to the south of Anomaly "C". Magnetic data, however, indicate that this anomaly may be separated by a dike to the high resistivity readings. Electromagnetic check survey encountered one marginal conductor at "C" and an apparently better electromagnetic conductor southwest of the said dike or dikes immediately north of Base Line No. 2.

Anomalous Zone "D" is a large anomaly located in Claims 45703 and 45708. "Lows" here are in the order of 600 to 700 ohm-cm. x 10^3, but the contrasts with neighbouring readings are not appreciable. Electromagnetic check work has not encountered any appreciable cross-over at "D".

Similarly, Anomalous Zone "E" is a weak resistivity anomaly with "lows" in the order of 700 ohm-cm. x 10^3, and without appreciable contrasts to neighbouring readings.

Immediately north of "D" and "E", the electromagnetic check work encountered one marginal cross-over at Line 76. The resistivity profile here is without appreciable contrasts.

GEOLOGICAL INTERPRETATION

For the purpose of geological interpretation in correlation with electrical resistivity data, ground magnetic data of the property (by Koulomzine, Geoffroy & Co. (1955)) were made available to Geo-Technical Development Company Limited, and a contour map was made from these and compiled on Plan No. 1 accompanying this report.

Koulomzine, Geoffroy & Co. pointed out that the magnetic data do not suggest the presence on the property of intrusive bodies of large size, but there could be some acidic intrusive of limited extent. From the resistivity point of view, however, there is hardly any difference between an acidic intrusive and a rhyolitic volcanic.

The magnetic data give indications of the occurrence of two conspicuous groups of transverse fractures with comparatively more intense magnetism, and can be accounted for by diabase dikes. These dikes cut across all but one shear zone and sheared geological boundaries indicated by resistivity data. The sulphide zone tested by previous diamond drilling at the western part of the property, is apparently stoped at the vicinity of a diabase

dike. It follows that the sulphide mineralization is probably of later origin than this dike, and possibly later than all the Matachewan diabase dikes in the area.

Resistivity data indicate the possibility of this sulphide-bearing shear zone being continuous southeasterly to Claim 45698, to Anomaly "A-1". "A-1" is not an electromagnetic conductor, but a good electromagnetic conductor was encountered at about 1,000 feet south of "A-1", at the south boundary of the property. It follows that the channel for the sulphide mineralization may be better developed at that location.

The fact that rhyolite and andesite are interfingering and one would not expect a difference in electrical resistivity between rhyolite and silicified andesite, hindered the interpretation of rock formations to be expected here and elsewhere on the property. One can, however, infer that the comparatively lower resistivity readings here are due to shearing plus the effect of topography.

The geological interpretation depicted on Plan No. 1 is therefore based on the following:

Rhyolite (including possible silicified andesite and acid intrusives), low magnetism and comparatively high resistivity.

- Shear rocks of the above may have low magnetism and moderate-to-low resistivity.

Andesite (including diabase): moderate-to-high magnetism and moderate resistivity.

- Fragmental volcanic, tuff and sheared rocks of the same may have higher-than-background magnetism and moderate-to-low resistivity.

The interpretation of faults and shears is further discussed in the following section of this report.

RESISTIVITY SURVEY METHOD AND INSTRUMENTATION

In short, a known current is introduced into the ground, by means of two screen contacts which are separated by a distance approximately equal to three times the width of the property, with a spread line drawn through the centre of the property, at right angles to the base line. The contacts are spaced equi-distant from the central base line. Readings are then taken at 50-foot intervals along the picket lines, by means of a sensitive vacuum tube voltmeter which measures the potential drop across the interval. The apparent resistivity is then calculated from the potential readings and current, in terms of ohm-centimeters.

Shear and fracture zones are relatively better conductors, due to their higher water content. This is true also of porous, unconsolidated, sediments. Extreme low resistivity readings may be due to graphite, or to sulphide mineralization, and there is no way to distinguish between sulphides and graphite, from the results

obtained. Graphite is suspected as the cause of an anomaly, when there are occurrences of this mineral within schists or shear zones in the immediate vicinity. Sulphide mineral deposits have also been discovered in areas of high resistivity contrasts which did not register extremely low readings.

For the electrical resistivity survey, a Canadian Research Institute Vacuum Tube Voltmeter, Model No. E-9008A, with 100-microvolt full-scale deflection, was used, together with a Canadian Fairbanks-Morse Onan Motor Generator Plant, 115V., 400W..

ELECTROMAGNETIC CHECK SURVEY METHODS AND INSTRUMENTATION

A Ronka Horizontal Loop Mark I instrument and a Sharpe SE-200 electromagnetic unit were used for limited check survey work over a few resistivity anomalies.

The Ronka Mark I unit consists essentially of a transmitter coil and a receiving coil, both horizontal, and maintained a fixed distance of 200 feet apart. A Vacuum Tube Oscillator and batteries supply an alternating current to the transmitting coil at a frequency of 876 cycles per second. The receiving coil with compensator and batteries measures two components (in-phase and out-of-phase) of the secondary field, which are expressed in percentage change from the normal electromagnetic field.

An ideal profile over a conductor would show a rise on approaching the conductor, then a sharp drop to negative readings, then a rise to positive readings when the two coils have been moved out of the zone of conduction. When the receiving coil is directly over the conductor, the readings at this point should be zero, or at background datum. The same is true when the transmitter is over the conductor.

Better conductors are indicated when the "in-phase" component shows a greater deviation than the "out-of-phase" component; if the converse is true, a poor conductor is indicated. Uneven topography may, in effect, bring the coils closer together. This increases the effect of the primary field on the receiving coil, resulting in positive "in-phase" readings. The equipment is zeroed with the coils lined up. If the coils are tilted an appreciable amount with respect to each other, a negative "in-phase" reading may be produced.

According to the designer of the instrument, the unit will detect good conductors to a depth of approximately 400 feet; the deeper the conductor, the better must be its conductivity to give a useful reading. The size and shape of the conductor have a considerable effect on the magnitude of the anomaly obtained. The overall accuracy of the equipment is $\pm 3\%$ of the scale reading $\pm 1\%$.

The Sharpe SE-200 unit was operated with transmitter horizontal and receiver vertical. The interpretation is similar to conventional vertical loop E. M. instruments with a "cross-over" indicating a conductor.

SURVEY DATA

An electrical resistivity survey and an electromagnetic check survey were conducted by Geo-Technical Development Company Limited on your 25-claim group property located in Jamieson Township, Ontario. The survey was carried out during the period from July 23 to September 19, 1959. The results are depicted on Plan No. 1 accompanying this report.

Three northwest-southeast base lines were cut on the property, with picket lines cut at 200-foot and 400-foot intervals, to cover 23 of the 25 claims. Base Line No. 1 was tied on to the base line cut on the neighbouring Kam-Kotia Porcupine Mines property. A total of 18 miles of lines was cut on the property, with an addition of 4 miles of spread line cut outside of the property for the survey operation.

A total of 15.8 miles of resistivity survey was carried out, with readings obtained at 50-foot intervals, totalling 835 readings.

A total of 6.6 miles of electromagnetic check survey was carried out to check anomalous conditions outlined by the resistivity survey and previous magnetic survey.

Respectfully submitted,

GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED

S. S. Szetu, Ph.D.,
Chief Geologist.

SSS:rap

Toronto, Ontario,

September 23, 1959.

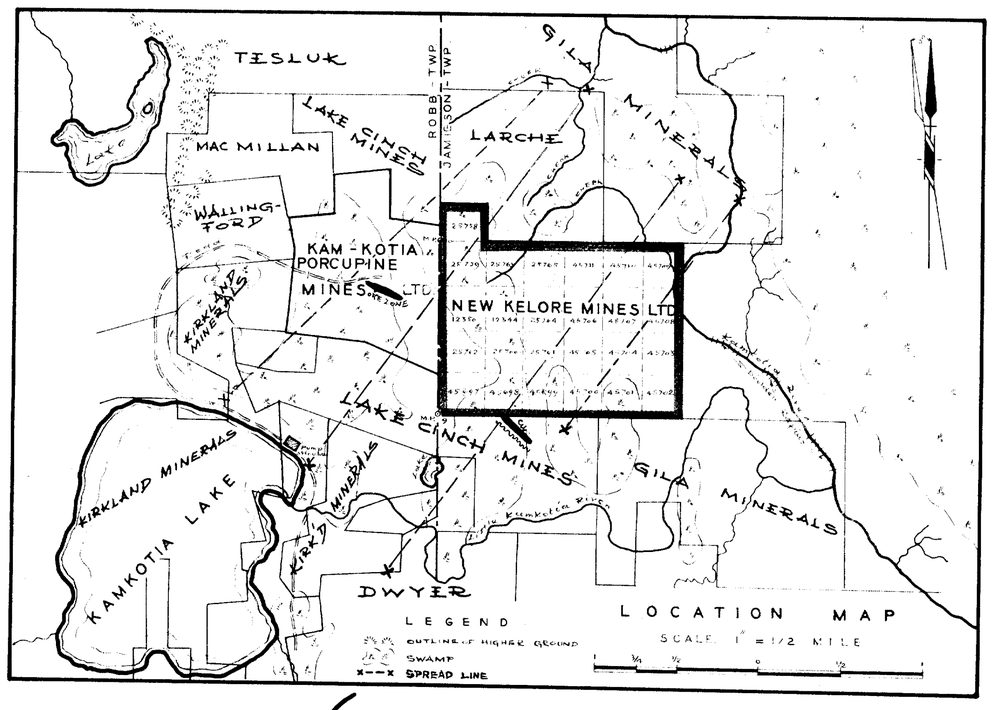
KAM-KOTIA PORCUPINE MINES LIMITED

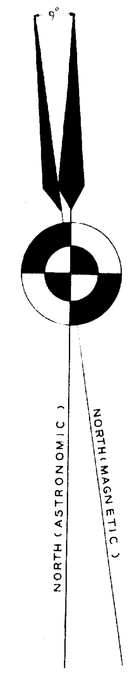
ROBB - TWP.
JAMIESON - TWP.

25758

MILE POST NO. - 10

MILE POST NO. - 9





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25763
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45705
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45699
45700
LOT - 12
LOT - 11
DIKE
DIKE?
BASE LINE
DDH NO-1
DDH NO-2
Rh-1
An-1
An-2
Rh-1 + An-1
Rh-1 + An-2
An-2 + Rh-2
An


GEOPHYSICAL SURVEY DATA ON PROPERTY OF
NEW KELORE MINES LIMITED
CONTOURS OF ELECTRICAL RESISTIVITY SURVEY DATA,
ISO-DYNAMIC CONTOURS OF MAGNETIC INTENSITIES,
PROFILES OF ELECTRO-MAGNETIC CHECK SURVEY DATA
AND
GEOLOGICAL INTERPRETATION
JAMIESON TOWNSHIP
TIMMINS AREA
ONTARIO
ELECTRICAL RESISTIVITY AND ELECTRO-MAGNETIC SURVEYS BY:
GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED
PLAN NO. - 1
SEPTEMBER - 1959
SCALE: 1" = 200'
NORTH (ASTRONOMIC)
NORTH (MAGNETIC)
LEGEND
LINES CUT AND CHAINED ELECTRICAL RESISTIVITY READINGS OBSERVED AND PLOTTED ON EAST SIDE OF LINE GRID.
ELECTRICAL RESISTIVITY CONTOUR.
MAGNETIC CONTOUR BASED ON DATA OBTAINED BY KOULOMZINE, GEOFFROY AND COMPANY 1955.
DENOTES ELECTRO-MAGNETIC PROFILE PLOTTED FROM READINGS OBSERVED BY SHARPE SE-200 INSTRUMENT WITH RECEIVER VERTICAL, TRANSMITTER HORIZONTAL AND EAST OF RECEIVER. NORTH DIP PLOTTED WEST OF PICKED LINE, SOUTH DIP PLOTTED EAST OF PICKED LINE, SCALE: 1/10" = 1° OF DIP.
DENOTES ELECTRO-MAGNETIC PROFILE PLOTTED FROM READINGS OBSERVED BY SHARPE SE-100 INSTRUMENT WITH TRANSMITTER AT STATION - 1. NORTH DIP PLOTTED WEST OF PICKET LINE. SOUTH DIP PLOTTED EAST OF PICKET LINE, SCALE: 1/10" = 1° OF DIP.
STN. NO. - 1 LOCATION OF TRANSMITTER STATION FOR THE ABOVE E.-M. SURVEY.
DATA OBTAINED BY RONKA MARK - I ELECTRO-MAGNETIC SURVEY. SOLID LINE DENOTES "IN PHASE COMPONENT" READINGS PLOTTED WEST OF LINE. DOTTED LINE DENOTES "OUT OF PHASE COMPONENT" READINGS PLOTTED EAST OF LINE. + AND - SIGNS SHOWN AT NORTH END OF PROFILES. SCALE: 1/10" = 2% OF PHASE CHANGE.
DIRECTION OF TRAVERSE (RECEIVER LEADING).
SWAMP AND AREA OF LOW GROUND.
OUTLINE OF HIGHER GROUND.
OUTCROP AREA.
CLAIM POST LOCATION AND CLAIM BOUNDARY.
APPROXIMATE LOCATION OF OLD DRILL HOLE.
ELECTRO-MAGNETIC "CROSS OVER".
INFERRED FAULT OR SHEAR.
INFERRED CROSS FAULT.
DIKE — DIABASE DIKE INFERRED FROM PREVIOUS SURVEY DATA.
INFERRED GEOLOGICAL BOUNDARY
An — MOSTLY INTERMEDIATE VOLCANICS An-1: MASSIVE, An-2: FRAGMENTAL, TUFF, SHEARED.
Rh — MOSTLY ACID VOLCANICS (RHYOLITE) Rh-1: MASSIVE, Rh-2: SHEARED.
CHOICE LOCATION FOR TEST DIAMOND DRILLING
0 - 800
800 - 900
900 - 1000
1000 - 1500
1500 - 2000
2000 - 3000
3000 - 5000
5000 - 10000
10000 - UP
(OHM-CM x 10³)
0 - 500
0 - 100
100 - 200
200 - 500
500 - 1000
1000 - UP
(IN GAMMAS)
C - V
C - IV
C - IV
C - III
45 711
45 710
45 709
45 706
45 707
45 708
45 705
45 704
45 703
45 700
45 701
45 702
An-1
An
An-2
Rh-1
DIKE
BASE LINE NO 3
"E"
"D"
"C"
DDH NO-4
DDH NO-5
DDH NO-6
DDH NO-2
CREEK
River
LOT - 10
76 - 7 - 59