REPORT ON A VLF RESISTIVITY (RADIOHM) SURVEY
B-30 GRID
BISLEY TOWNSHIP
LARDER LAKE MINING DIVISION, ONTARIO
NTS 32D5

RECEIVED
MAY 17 1989
MINING LANDS SECTION

Jim Whelan
April 20th, 1989
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ENCLOSURE B-30 GRID VLF RESISTIVITY SURVEY PLAN
INTRODUCTION:

This Report details the results of a VLF Resistivity Survey carried out in June and July of 1987 over a claim group in Bisley Township.

PROPERTY DESCRIPTION, LOCATION AND ACCESS

The property consists of 6 contiguous unpatented mining claims numbered as follows; L-890930, L-890931, L-890932, L-890933, L-890934 and L-858271. These claims are located in the south east quarter of Bisley Township and are accessible via the Esker Park road from Highway 66 and a northwesterly trending logging road approximately 15Km north of Highway 66. (Figures 1 and 2)

TOPOGRAPHY

Elevations on the Property range from 1050 to 1150 feet as indicated on the 1:50,000 topographic map 32D/5. Nikila Lake lies in the approximate centre of the property and is drained by a westerly trending small stream. A large portion of the property has been cut over recently leaving few mature coniferous trees.

(1)
FIG. 1
1cm = 4 km
PREVIOUS WORK

Ground magnetic and VLF-EM surveys were conducted in the area by Falconbridge Ltd. in 1979 and Monpros in 1984. Monpros also conducted Gravity and Induced Polarization Surveys and a 6 hole overburden drilling program. In 1979 Questor Surveys carried out an Airborne Electromagnetic and Total Intensity Magnetic Surveys over the Kirkland Lake area including Bisley Township. No Airborne Electromagnetic anomalies were located on the property but the magnetic survey outlined a circular magnetic high centered on Nikila Lake. Between 1986 and 1988 LAC Minerals LTd. conducted Ground Magnetic and VLF-EM surveys over the property.

GEOLOGY

The area is primarily underlain by archean mafic to felsic volcanics with mafic intrusives. The property is mapped as mainly drift covered intermediate volcanics with a quartz gabbro located southwest of Nikila Lake. A north west trending fault cuts through the property west of Nikila Lake. (OGS Geological Report 103, Map 2252)
SURVEY PROCEDURE

The survey was conducted by LAC Minerals personal using a Geonics VLF-EM 16R Electromagnetic Receiver and the VLF Transmitting Station at Annapolis Maryland (21.4kHz). Apparent Resistivity and Phase Angle values were recorded at 25 meter intervals on lines with a 100 meter spacing.

SURVEY RESULTS

From the low resistivity and Phase angle values observed over most of the property it is apparent that the depth of penetration was severely limited by a thick layer of overburden (Glaciofluvial Sand). Small areas of high resistivity are located over topographic highs indicating near surface bedrock.

CONCLUSIONS

No anomalies of interest were located with this survey method. In order to locate conductive bodies, if any are present on the property, a deeper penetrating Electromagnetic or Induced Polarization survey would be needed to see through the thick overburden layer.
REFERENCES


CERTIFICATION

I, Jim Whelan of 6 Baron Avenue, Kirkland Lake, Ontario, hereby certify:

That I am a Geotechnician employed by LAC Minerals Ltd.

That I have been practicing my profession for 7 years.

That I am qualified to write this report.

Jim Whelan
EM16R SPECIFICATIONS

MEASURED QUANTITY
- Apparent Resistivity of the ground in ohm-meters
- Phase angle between $E_x$ and $H_y$ in degrees

RESISTIVITY RANGES
- 10 – 300 ohm-meters
- 100 – 3000 ohm-meters
- 1000 – 30000 ohm-meters

PHASE RANGE
0-90 degrees

RESOLUTION
- Resistivity: ± 2% full scale
- Phase: ± 0.5°

OUTPUT
Null by audio tone. Resistivity and phase angle read from graduated dials.

OPERATING FREQUENCY
15-25 kHz VLF Radio Band. Station selection by means of rotary switch.

INTERPROBE SPACING
10 meters

PROBE INPUT IMPEDANCE
100 MΩ in parallel with 0.5 picofarads

DIMENSIONS
19 x 11.5 x 10 cm.
(attached to side of EM16)

WEIGHT
1.5 kg (including probes and cable)
Ministry of Report of Work
Northern Development
and Mines
Geophysical, Geological
and Mines Geophysical, Geological
and Mines, Geochemical and Expence
Ontario
Claim Holder(s)
LAC Minerals Ltd.
Address
91 Duncan Avenue, KIRKLAND LAKE, Ontario P2N 1Y2
Survey Company
LAC Minerals Ltd.
Name and Address of Author (of Geo-Technical report)
Jim Whelan, 6 Baron Avenue, KIRKLAND LAKE, Ontario

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<thead>
<tr>
<th>Mining Claim</th>
<th>Expended Days Cr.</th>
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Special Provisions

For first survey:
- Geophysical: Electromagnetic - 20 days
- Radiometric
- Other

For each additional survey:
- Geophysical: Electromagnetic - 20 days
- Radiometric
- Other

Man Days

Geophysical: Electromagnetic - 20 days per Claim
Radiometric

Airborne Credits

Note: Special provisions do not apply to Airborne Surveys.

Expenditures (excludes power stripping)

Total number of mining claims covered by this report of work: 6

Date
March 16th, 1989

Certification

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying
John Kovala, 91 Duncan Avenue, KIRKLAND LAKE, Ontario P2N 1Y2

Date
March 16th, 1989
Type of Survey(s): VLF Resistivity
Township or Area: Bisley Township
Claim Holder(s): LAC Minerals Ltd.
Survey Company: LAC Minerals Ltd.
Author of Report: Jim Whelan
Address of Author: 6 Baron Ave., Kirkland Lake, Ontario
Covering Dates of Survey: 24/06/87 - 23/07/87
Total Miles of Line Cut: 4.5

MINING CLAIMS TRAVERSED
List numerically

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<th>L</th>
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TOTAL CLAIMS: 6

Previous Surveys

File No. | Type | Date | Claim Holder |
|---------|------|------|--------------|

Res. Geol. Qualifications: 215/64

DATE: Wed 12th June 09
SIGNATURE: [Signature]

Geophysical
- Electromagnetic
- Magnetometer
- Radiometric
- Other

Geochemical

Total

SPECIAL PROVISIONS
CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.
ENTER 20 days for each additional survey using same grid.

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer
Electromagnetic
Radiometric

Res. Geol. Qualifications: 215/64
GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS — If more than one survey, specify data for each type of survey

Number of Stations 283
Number of Readings 283
Station interval 25 meter
Line spacing 100 meter
Profile scale
Contour interval 1000, 5000 ohm meter

Instrument
Accuracy — Scale constant
Diurnal correction method
Base Station check-in interval (hours)
Base Station location and value

Instrument Geonics EM-16R
Coil configuration na
Coil separation na
Accuracy Resistivity ± 2% full scale, Phase Angle ± 0.5°
Method: ☑ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line
Frequency Tx at Annapolis, Maryland 21.4 kHz
Parameters measured Apparent resistivity of the ground in ohm meters, phase angle in degrees

Instrument
Scale constant
Corrections made
Base station value and location
Elevation accuracy

Instrument
Method ☐ Time Domain ☐ Frequency Domain
Parameters — On time ——
— Off time ——
— Delay time ——
— Integration time ——
Power
Electrode array
Electrode spacing
Type of electrode
**SELF POTENTIAL**

Instrument __________________________ Range __________________

Survey Method __________________________________________

Corrections made ________________________________________

**RADIOMETRIC**

Instrument __________________________

Values measured ________________________________________

Energy windows (levels) ______________________

Height of instrument __________________________ Background Count

Size of detector __________________________

Overburden __________________________

(type, depth — include outcrop map)

**OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)**

Type of survey __________________________

Instrument __________________________

Accuracy __________________________

Parameters measured __________________________

Additional information (for understanding results) __________________________

**AIRBORNE SURVEYS**

Type of survey(s) __________________________

Instrument(s) __________________________ (specify for each type of survey)

Accuracy __________________________ (specify for each type of survey)

Aircraft used __________________________

Sensor altitude __________________________

Navigation and flight path recovery method __________________________

Aircraft altitude __________________________ Line Spacing __________________________

Miles flown over total area __________________________ Over claims only __________________________
GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken.

Total Number of Samples

Type of Sample [Nature of Material]

Average Sample Weight

Method of Collection

Soil Horizon Sampled

Horizon Development

Sample Depth

Terrain

Drainage Development

Estimated Range of Overburden Thickness

SAMPLE PREPARATION
(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis

ANALYTICAL METHODS

Values expressed in: per cent [ ] p. p. m. [ ] p. p. b. [ ]

Cu, Pb, Zn, Ni, Co, Ag, Mo, As, (circle)

Others

Field Analysis (tests)

Extraction Method

Analytical Method

Reagents Used

Field Laboratory Analysis

No. (tests)

Extraction Method

Analytical Method

Reagents Used

Commercial Laboratory (tests)

Name of Laboratory

Extraction Method

Analytical Method

Reagents Used

General
ME MMR UNIT FORESTER FOR THIS AREA CAN BE
SWASTIKA ONT.

MAY BE SUBJECT TO FORESTRY OPERATIONS.

THIS TOWNSHIP AREA FALLS WITHIN THE
OFFICE OF FORESTRY ACTIVITY
AS TOWNSHIP AREA FALLS WITHIN THE
MANAGEMENT UNIT.

WE ARE SUBJECT TO FORESTRY OPERATIONS.
TheManagement Unit Forester For This Area Can Be
Contacted At: P.O. BOX 229
SITHEA, ONT.
705-642-3322

REFERENCES
REAL WITHDRAWN FROM DISPOSITION
M.R.O. - MINING RIGHTS ONLY
S.R.O. - SURFACE RIGHTS ONLY
M & S - MINING AND SURFACE RIGHTS

DISPOSITION OF CROWN LAND

TOWNSHIP
BISLEY
M.N.R. ADMINISTRATIVE DISTRICT
KIRKLAND LAKE
MINING DIVISION
LARDER LAKE
LAND TITLES / REGISTRY DIVISION
COCHRANE

M.N.R. ADMINISTRATIVE DISTRICT
KIRKLAND LAKE
MINING DIVISION
LARDER LAKE
LAND TITLES / REGISTRY DIVISION
COCHRANE

ONTO