GEOPHYSICAL REPORT
ON THE
KABINAKAGAMI LAKE PROPERTY
FOR
ORFORD RESOURCES LIMITED

RECEIVED
MAY 8, 1989
MINING LANDS SECTION

Prepared by:
S. Anderson
Exsics Exploration
April 25, 1989
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INTRODUCTION

A Magnetometer and Induced Polarization Survey was conducted on the Kabinakagami Lake Property, located in Lizard and Ermine Townships, District of Algoma.

This program conducted by Exsics Exploration Limited under contract to Orford Resources Limited, was completed during the month of February, 1989. The surveys were performed on a block of 52 contiguous, unpatented mining claims, which were covered by a total of 42.35 km (26.32 miles) of grid lines.

The purpose of this program was to outline any geophysical responses which may indicate areas that appear favorable for gold or base metal deposition.

PERSONNEL

People directly involved with this program were employed by Exsics Exploration Limited and are as follows:

Danny Rifou ......................... Sturgeon Falls
Lanny Anderson ...................... Timmins
Eddy Brunett ....................... Timmins
Dave Clement ....................... Timmins

All work was supervised by R. J. Meikle.
QUEBEC • CHIBOUSAMAU

EXSICS EXPLORATION LTD,
P.O. Box 1670, P4N-7X1
Suite 13, Hollinger Bldg, Timmins Ont.
Telephone: 705-267-4151

CLIENT: ORFORD RESOURCES LIMITED
PROPERTY: KABINAKAGAMI LAKE PROP.
TITLE: LOCATION MAP

Fig. 1

Date: April 1989 Scale: l"=25miles NTS:
Drawn: Interp: Job No. EE-220
The claim numbers covered by the survey grid on the Kabinakagami Lake Project are listed below:

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972113 | " | 972154 | "
972114 | Lizard | 972155 | "

(52 Claims)

LOCATION AND ACCESS

The Kabinakagami Lake Property is located in Lizard and Ermine Townships, District of Algoma, Sault Ste. Marie Mining Division. It is situated approximately 96.5 km (60 miles) southwest from the town of Hearst and approximately 21 km (13 miles) southwest from the village of Oba. The entire grid is located on the central section of Kabinakagami Lake.

Access to the property during the survey period was gained by going south from Hearst on Hwy 583 and the Caithness road for approximately 96.5 km (60 miles) to the village of Oba.
From Oba, a camp was mobed into Kabinakagami Lake by helicopter supplied by Canadian Helicopters from Wawa, and a base camp was established on the lake near the property. From here the grid was accessed by snowmobile for the entire survey period. A one hour snowmobile ride from the base camp, down the Oba river, provided access to the village of Oba in case of emergency.

During the summer months, the property is most easily accessed by float plane. However, access by boat is also possible by way of the Oba River which leads from Oba to Kabinakagami Lake.

GEOPHYSICAL PROGRAM

This program, completed by Exsics Exploration Limited during the month of February 1989, consisted of a total field magnetic survey and a "gradient array" induced polarization survey. The entire grid was read at 200 meter line spacing with 25 meter station intervals.

Magnetic Survey:

The magnetic survey was completed on 36.05 km (22.39 miles) of grid lines using the EDA Omni IV System. A total of 1442 readings were recorded across the grid. The specifications of the EDA Omni IV System can be found under Appendix A of this report.

This survey was done by using a base station. A fixed point was established on the survey grid, and the base station unit was tuned to a reference field of 58,000 gammas. The field units were also tuned at the same fixed point and set to the same reference field.

- 4 -
The base station unit was set to record and store readings at 30 second intervals, so as to monitor any spiking or change in the earth's diurnal throughout the day.

At the end of the day, the field units and the base station unit are coupled together and the raw field data is dumped to the base station, where it is merged. The internal microprocessor then computes the diurnal variation in the earth's magnetic field for each surveyed grid coordinate by comparing the times at which the readings were taken and computing any mid-interval values.

This correlation is done during the data dump of the units. The retrieved data is corrected data ready for plotting. Each value has had 58,000 gammas subtracted from it for ease in plotting.

The base station corrected method is most useful in the northern latitudes where more detailed monitoring of the diurnal variation is required.

This unit is capable of recording and storing magnetic values accurate to the decimal point, thus greatly improving the accuracy and quality of the data obtained.

The data obtained in the field was the plotted on a base map at a scale of 1:5000 and contoured at 50 gamma intervals wherever possible. This map can be found in the back pocket of this report.
Induced Polarization Survey:

The induced polarization survey was completed on 32.85 km (20.41 miles) of grid lines using the EDA IP-2 receiver and the Scintrex IPC-7 transmitter. A total of 905 readings were recorded across the grid. The specifications of the EDA IP-2 receiver and the IPC-7 transmitter can be found under Appendix B and C of this report.

The gradient array method involves placing two infinite or remote electrodes (A-B) a fixed distance apart, three times the length and parallel to the line to be surveyed.

A potential is applied across A-B using a motor generator powered transmitter capable of producing, in this case 2500 watts maximum output. The potential is applied continuously using a 2 second on, 2 second off square wave direct current. The middle one-third of A-B is surveyed from this set-up, as well as parallel lines either side until the signal decreases, at which point another A-B set-up is required further along the geological strike. A single receiving dipole (P1-P2) consists of two electrodes a fixed distance of 25 meters apart, was moved along the survey lines. A single reading was recorded every 25 meters with the reading plotting between (P1-P2). The following two parameters were recorded at each station.
Chargeability:

The potential across P1-P2 was recorded during the 2 second off cycle. The potential was an integration over a selected window width (time in milliseconds), a fixed delay time after the current shut off. This reading is expressed in millivolts per volt, or milliseconds.

Primary Voltage:

The potential across P1-P2 was recorded during the 2 second on cycle. This potential is a direct result of the A-B output current (amperes), the distance of the P1-P2 from A-B, and the true resistivity of the measured medium, which is a combination of the geological rock units within the influence of the measuring P1-P2 dipoles, as well as the overburden. Thus "ohm's law" is used to compute the apparent resistivity of the measured medium beneath P1-P2 with a constant for "K" factor applied. The "K" factor is used to compensate for the Geometric Factor, which is the relative positions between A-B and P1-P2. The resultant value is called "Apparent Resistivity" as it is not the true resistivity of the bedrock, but rather a combination of the overburden as well. The following parameters were used:
Electrode Array - Gradient
Dipole Spacing - 50 meters
Method - Time Domain
Receiver - EDA IP-2
Transmitter - Scintrex IPC-7
Pulse Time - 2 seconds on, 2 seconds off, square wave
Delay Time - 500 milliseconds
Integration Time - 420 milliseconds

Parameters Measured A: Chargeability (millivolts per volt or milleseconds) presented in plan contoured form, 1:2500.

B: Apparent Resistivity (ohm-meters) presented in plan contoured form 1:2500.

SURVEY RESULTS

The geophysical program conducted on the Kabinakagami Lake was successful in outlining one main area of interest.

This feature, which strikes from LOW/450N to L12W/800N, shows up as an IP response with chargeabilities of roughly 2 times background occurring over a resistivity high. Because of a series of small islands on strike with this zone, it may be possible that this feature is the result of a bedrock ridge extending out into the lake.
A magnetic high running north-south along L4W appears to cut through this zone. This may be the result of a diabase dyke striking through this area, as shown by Map 2220, Manitouwadge Wawa Sheet, Geological Compilation Series.

This feature is the only notable IP response that occurs throughout the survey grid. A number of areas with weak magnetic responses are situated throughout the property. This is likely the result of contrast between the mafic and granitic rock units occurring throughout this area, as shown by Map 2220, Manitouwadge Wawa Street, Geological Compilation Series.

RECOMMENDATIONS AND CONCLUSIONS

As mentioned under results, the geophysical program conducted was successful in outlining one main area of interest. Although it is possible that this features' response may be the result of a bedrock ridge, further work should be conducted to verify this possibility.

Because this zone appears as a resistive unit rather than conductive, it is difficult to recommend any further geophysical programs at this point. However, a detailed geological mapping program along the shore line in the area of this zone would be recommended. As well, a small island on strike with this feature should be thoroughly mapped in order to determine the possible cause of this zone.
CERTIFICATION

I, Steve Anderson of Timmins, Ontario hereby certify that:

1. I hold a three year Technologist Diploma from the Sir Sandford Fleming College, Lindsay, Ontario, obtained in 1982.

2. I have been practising my profession since 1980 in Ontario, Quebec, Saskatchewan and NWT, for Urangesellschaft Canada Ltd., Asamera Oil Ltd., Rayan Explorations, and most recently Exsics Exploration Ltd.

3. I have based conclusions and recommendations contained in this report on knowledge of the area, my previous experience, and on the results of the field work conducted on the property during February 1989.

4. I hold no interest, directly or indirectly in this property, nor do I expect to receive any interest in the KABINAKAGAMI LAKE PROPERTY for ORFORD RESOURCES LIMITED, or any of it's subsidiary companies.

Dated this 25th day of April 1989
at Timmins, Ontario.

S. D. Anderson
OMNI IV's Major Benefits

- Four Magnetometers in One
- Self Correcting for Diurnal Variations
- Reduced Instrumentation Requirements
- 25% Weight Reduction
- User Friendly Keypad Operation
- Universal Computer Interface
- Comprehensive Software Packages
### Specifications

**Dynamic Range**
18,000 to 110,000 gammas. Roll-over display feature suppresses first significant digit upon exceeding 100,000 gammas.

**Tuning Method**
Tuning value is calculated accurately utilizing a specially developed tuning algorithm.

**Automatic Fine Tuning**
± 15% relative to ambient field strength of last stored value.

**Display Resolution**
0.1 gamma

**Processing Sensitivity**
± 0.02 gamma

**Statistical Error Resolution**
0.01 gamma

**Absolute Accuracy**
± 1 gamma at 50,000 gammas at 23°C
± 2 gamma over total temperature range

**Standard Memory Capacity**
- Total Field or Gradient: 1,200 data blocks or sets of readings
- Tie-Line Points: 100 data blocks or sets of readings
- Base Station: 5,000 data blocks or sets of readings

**Display**
Custom-designed, ruggedized liquid crystal display with an operating temperature range from -40°C to +55°C. The display contains six numeric digits, decimal point, battery status monitor, signal decay rate and signal amplitude monitor and function descriptors.

**RS 232 Serial I/O Interface**
2400 baud, 8 data bits, 2 stop bits, no parity

**Gradient Tolerance**
6,000 gammas per meter (field proven)

**Test Mode**
- A. Diagnostic testing (data and programmable memory)
- B. Self Test (hardware)

**Sensor**
Optimized miniature design. Magnetic cleanliness is consistent with the specified absolute accuracy.

**Gradient Sensors**
0.5 meter sensor separation (standard), normalized to gammas/meter. Optional 1.0 meter sensor separation available. Horizontal sensors optional.

**Sensor Cable**
Remains flexible in temperature range specified, includes strain-relief connector

**Cycling Time (Base Station Mode)**
Programmable from 5 seconds up to 60 minutes in 1 second increments

**Operating Environmental Range**
-40°C to +55°C; 0-100% relative humidity; weatherproof

**Power Supply**
Non-magnetic rechargeable sealed lead-acid battery cartridge or belt; rechargeable NiCad or Disposable battery cartridge or belt; or 12V DC power source option for base station operation.

**Battery Cartridge/Belt Life**
2,000 to 5,000 readings, for sealed lead acid power supply, depending upon ambient temperature and rate of readings

**Weights and Dimensions**
- Instrument Console Only: 2.8 kg, 238 x 150 x 250mm
- NiCad or Alkaline Battery Cartridge: 1.2 kg, 235 x 105 x 90mm
- NiCad or Alkaline Battery Belt: 1.2 kg, 540 x 100 x 40mm
- Lead-Acid Battery Cartridge: 1.8 kg, 235 x 105 x 90mm
- Lead-Acid Battery Belt: 1.8 kg, 540 x 100 x 40mm
- Sensor: 1.2 kg, 56mm diameter x 200mm
- Gradient Sensor (0.5m separation - standard): 2.1 kg, 56mm diameter x 790mm
- Gradient Sensor (1.0m separation - optional): 2.2 kg, 56mm diameter x 1300mm

**Standard System Complement**
- Instrument console, sensor, 3-meter cable, aluminum sectional sensor staff, power supply, harness assembly, operations manual.

**Base Station Option**
Standard system plus 30 meter cable

**Gradiometer Option**
Standard system plus 0.5 meter sensor
Product Information
IP-2 TWO DIPOLE
TIME DOMAIN IP RECEIVER

MAJOR BENEFITS

* TWO DIPOLES SIMULTANEOUSLY MEASURED
* SOLID STATE MEMORY
* AUTOMATIC PRIMARY VOLTAGE (Vp) RANGING
* AUTOMATICALLY CALCULATES APPARENT RESISTIVITY
* COMPUTER COMPATIBLE

EDA Instruments Inc., Head Office: 4 Thorncliff Park Drive, Toronto, Canada M4H 1H1
Telephone: (416) 425-7800, Telex: 06 23222 EDA TOR, Cables: INSTRUMENTS TORONTO

In USA, EDA Instruments Inc., 5151 Ward Road, Wheat Ridge, Colorado 80033
Telephone: (303) 422-9112
Specifications

Dipoles: Two simultaneous input dipoles.
Input Voltage (Vp) Range: 40 microvolts to 4 volts, with automatic ranging and overvoltage protection.
Vp Resolution: 10 microvolts.
Vp Accuracy: 0.3% typical; maximum 1% over temperature range.
Chargeability Resolution: 0.3% typical; maximum 1% over temperature range for Vp > 10 mV.
Chargeability Accuracy: 0.3% typical; maximum 1% over temperature range for Vp > 10 mV.
Automatic SP Compensation: ±1 V with linear drift correction up to 1 mV/s.
Input Impedance: 1 Megohm.
Sample Rate: 10 milliseconds.
Automatic Stacking: 3 to 99 cycles.
Synchronization: Minimum primary voltage level of 40 microvolts.
Rejection Filters: 50 and 60 Hz power line rejection greater than 100 dB.
Grounding Resistance Check: 100 ohm to 128 kilo-ohm.
Compatible Transmitters: Any time domain waveform transmitter with a pulse duration of 1 or 2 seconds and a crystal timing stability of 100 ppm.
Programmable Parameters: Geometric parameters, time parameter, intensity of current, type of array and station number.
Display: Two line, 32-character alphanumeric liquid crystal display protected by an internal heater for low temperature conditions.
Memory Capacity: 600 sets of readings.
RS-232C Serial I/O Interface: 1200 baud, 8 data bits, 1 stop bit, no parity.
Console Power Supply:Six- 1.5V "D" cell disposable batteries with a maximum supply current of 70 mA and auto power save.
Operating Environmental Range: -25°C to +55°C; 0–100% relative humidity; weatherproof.
Storage Temperature Range: -40°C to +60°C.
Weight and Dimensions: 5.5 kg, 310x230x210 mm.
Available Options: Stainless steel transmitting electrodes, copper sulphate receiving electrodes, alligator clips, bridge leads, wire spools, Interface cables, rechargeable batteries, charger and software programs.
IPC Time Domain Induced Polarization/Resistivity Transmitters

The Scintrex IPC Series of Time Domain Transmitters was designed for operation with the IPR-8, IPR-10 and RDC-8 Receivers. Three models are available, rated at 250W, 2.5kW and 15kW which are designated the IPC-8/250W, IPC-7/2.5kW and IPC-7/15kW respectively. While the IPC-8/250W is powered from internal, rechargeable batteries, the other, more powerful models use motor-generators as power sources.

Since the IPC-8/250W Transmitter is light enough (15.5 kg) to be moved from observation to observation, it can provide a high speed of operation for dipole-dipole and Wenner arrays when a low power source would suffice. It is also ideal for drillhole logging.

The IPC-7/2.5kW Model is an all purpose, medium power system. It is the standard power transmitter used on most surveys under a wide variety of geophysical, topographical and climatic conditions.

The IPC-7/15kW Unit is ideal for use where high power is required to survey to great depths using large electrode spacings, even in areas of low resistivity or high contact resistance. Normally the motor-generator is installed on a single axle trailer to be towed to each transmitting station.

The two higher powered transmitters feature overload and underload protection circuits and other safety features.

...
**Ministry of Northern Development and Mines**

**Report of Work**

(geophysical, geological, geochemical and expenditures)

**Type of Survey(s)**
- Magnetometer & 1. P.

**Claim Holder(s)**
- Oxford Resources

**Prospector's Licence No.**
- T-4993

**Address**
- 140 H 141 Adelaide St. W. Toronto Ont.

**Survey Company**
- EXSIC

**Date of Survey (from & to)**
- Day 1, Month 1, Year 1 to Day 2, Month 2, Year
- Total Miles of line Cut
- 26.32 miles

**Name and Address of Author (of Geo-Technical report)**
- S. Anderson
- Box 1330 Timmins Ont. P4N 7J8

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### Credits Requested per Each Claim in Columns at right

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### Special Provisions

For first survey:
- Enter 40 days. (This includes line cutting)

For each additional survey:
- Using the same grid:
  - Enter 20 days (for each)

### Man Days

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### Geophysical

- Electromagnetic
- Magnetometer
- Radiometric
- Other
- Geological
- Geochemical

### Expenditures (excludes power stripping)

#### Type of Work Performed

- Performed on Claim(s)

#### Calculation of Expenditure Days Credits

**Total Expenditures**

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**Total Days Credits**

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**Instructions**

Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

---

**Date Certified**
- May 15/59

**Recorded Holder or Agent (Signature)**
- Henry Hutter

**Certification Verifying Report of Work**

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**
- Box 1330 Timmins Ont. P4N 7J8

---

**For Office Use Only**

**Total Days Credit**
- 1,040

**Date Deposited as Recorded**
- May 16/89

**Branch Director**
- S. Anderson

**Date Certified**
- May 15/89

**Certified by (Signature)**
- Henry Hutter
The claim numbers covered by the survey grid on the Kabinakagami Lake Project are listed below:

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(52 Claims)
Dear Madam:


The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

W.R. Cowan
Provincial Manager, Mining Lands Mines & Minerals Division

cc: Mr. G.H. Ferguson
    Mining and Lands Commissioner
    Toronto, Ontario

    Orford Resources
    402-27 Queen Street E.
    Toronto, Ontario
    M5C 2M6

    S. Anderson
    P.O. Box 1330
    Timmins, Ontario
    P4N 7J8

Resident Geologist
Wawa, Ontario
Recorded Holder: ORFORD RESOURCES
Township or Area: LIZAR AND ERMINE TOWNSHIP.

<table>
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<th>Type of survey and number of Assessment days credit per claim</th>
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<td>971974 to 76 incl.</td>
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<td>Radiometric</td>
<td>971987 to 89 incl.</td>
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<td>Induced polarization</td>
<td>971999 to 2000</td>
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<tr>
<td>Other</td>
<td>972079 to 83 incl.</td>
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<td>Section 77 (19) See &quot;Mining Claims Assessed&quot; column</td>
<td>972098 to 102 incl.</td>
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<td>972123 to 30 incl.</td>
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<td>972137 to 44 incl.</td>
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<td>972210 to 55 incl.</td>
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Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

- [ ] not sufficiently covered by the survey
- [ ] insufficient technical data filed

Note: No credits considered for the Induced polarization as the maximum geophysical credits have been reached.

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19) - 60.
Ministry of Northern Development and Mines

Geophysical-Geological-Geochemical Technical Data Statement

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s)  Induced Polarization
Township or Area  Ermine and Lizard Townships
Claim Holder(s)  Orford Resources Limited
(Kabinakagami Lake Property)
Survey Company  Exsics Exploration Ltd.
Author of Report  S. Anderson
Address of Author  P.O. Box 1880 TIMMINS, ON P4N 7X7
Covering Dates of Survey  Feb. 17/89 - Apr. 25/89
(linecutting to office)
Total Miles of Line Cut  42.35 km (26.32 miles)

SPECIAL PROVISIONS
CREDITS REQUESTED

Geophysical
- Electromagnetic
- Magnetometer  40
- Radiometric
IP - Other  20
Geological
Geochemical

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

Magnetometer  Electromagnetic  Radiometric
(enter days per claim)

DATE: April 25/89 SIGNATURE: [Signature]
Author of Report or Agent

Res. Geol.  Qualifications  2.1230

Previous Surveys

<table>
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<tr>
<th>File No.</th>
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<th>Claim Holder</th>
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</table>

TOTAL CLAIMS  52
GEOPHYSICAL TECHNICAL DATA

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

Number of Stations 1442
Number of Readings Mag-1442
Station interval 25 meters
Line spacing 200 meters
Profile scale
Contour interval

Instrument EDA Omni IV
Accuracy — Scale constant + 0.1 gammas
Diurnal correction method Base Station
Base Station check-in interval (hours) 30 seconds
Base Station location and value

Electromagnetic

Instrument
Coil configuration
Coil separation
Accuracy
Method: □ Fixed transmitter □ Shoot back □ In line □ Parallel line
Frequency
Parameters measured

Gravity

Instrument EDA IP-2
Method □ Time Domain □ Frequency Domain
Parameters — On time 2 seconds
— Off time 2 seconds
— Delay time 500 ms
— Integration time 420 ms
Frequency
Range

Induced polarization

Instrument Scintrex — IPC-7
Electrode array Gradient
Electrode spacing 25 and 50 meters
Type of electrode Stainless Steel
### SELF POTENTIAL

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<th>Instrument</th>
<th>Range</th>
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<tr>
<td>Survey Method</td>
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<td>Corrections made</td>
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### RADIOMETRIC

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<th>Values measured</th>
<th>Energy windows (levels)</th>
<th>Height of instrument</th>
<th>Background Count</th>
<th>Size of detector</th>
<th>Overburden (type, depth — include outcrop map)</th>
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### OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

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<th>Instrument</th>
<th>Accuracy</th>
<th>Parameters measured</th>
<th>Additional information (for understanding results)</th>
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### AIRBORNE SURVEYS

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<th>Accuracy (specify for each type of survey)</th>
<th>Aircraft used</th>
<th>Sensor altitude</th>
<th>Navigation and flight path recovery method</th>
<th>Aircraft altitude</th>
<th>Line Spacing</th>
<th>Miles flown over total area</th>
<th>Over claims only</th>
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**GEOCHEMICAL SURVEY – PROCEDURE RECORD**

Numbers of claims from which samples taken: ________________________________

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**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: ____________________

Extraction Method: __________________

Analytical Method: __________________

Reagents Used: _____________________

Field Laboratory Analysis: _________

No. (____________________ tests)

Extraction Method: __________________

Analytical Method: __________________

Reagents Used: _____________________

Commercial Laboratory: ____________

Name of Laboratory: __________________

Extraction Method: __________________

Analytical Method: __________________

Reagents Used: _____________________

Sample Preparation: ________________

(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis: ____________________________

General: __________________________

[Additional lines not transcribed]
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52 Claims