



42A01NE0110 2.14021 TECK

2.14021

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REPORT ON
GEOPHYSICAL WORK
RAND PROPERTY
TECK TOWNSHIP
FOR
BATTLE MOUNTAIN (CANADA) INC.

FEBRUARY 1991

RECEIVED

MAR 22 1991

MINING LANDS SECTION

D. LONDY
TIMMINS GEOPHYSICS LTD.

SUMMARY AND RECOMMENDATIONS

In February 1991 magnetic and VLF-EM surveys were carried out over nine claims in Teck Township.

The VLF results mapped the edge of low swampy ground and were of little help in defining structure and mineralization on the property.

The magnetic survey mapped a number of significant features on the property.

- Narrow linear magnetic high anomalies are interpreted to reflect tuffs or trachytic pyroclastics. Offsets in these fairly persistent units help in mapping cross and diagonal faults.

- Narrow linear magnetic low anomalies are interpreted as alteration zones associated with strike faults.

- Discontinuous irregular shaped high anomalies have a number of sources including basic volcanics, syenite porphyries and carbonate rocks. The amplitude of these anomalies depends on the source, the depth of the source and perhaps, the varying composition of the intrusives.

The source of these anomalies should be re-assessed once the property is mapped. A decision on whether any further surveys are warranted will also depend on the geology and a compilation of previous data on the former Hudson-Rand deposit.

It is recommended that the 50 metre spaced lines are extended to cover the two most southern claims. This will better define a broad magnetic low anomaly which strikes east northeast through the middle of the claims.



010C

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3. MAGNETIC RESULTS (BACK POCKET)

INTRODUCTION

During February 1991, magnetic and very low frequency electromagnetic (VLF-EM) surveys were carried out for Battle Mountain (Canada) Inc. over the Rand Property, located in Teck Township. The purpose of the geophysical program was to map structure, alteration and mineralization which may have associated gold mineralization.

The property is located on the south side of the town of Kirkland Lake in the Larder Lake Mining Division. It consists of nine claims numbered as follows:

L 1049642

L 1111439 - L 1111442 inclusive

L 1111453

L 1132251

L 1132280

L 1146063

Access to the property was easily attained from a number of streets along the southern edge of the town of Kirkland Lake.

The field data was collected by D. Londry and L. Varin.

GENERAL GEOLOGY

Regionally, the property is situated within the Abitibi Greenstone Belt, which consists of Archean sediments and felsic to mafic volcanics which have been intruded by granitic and mafic bodies.

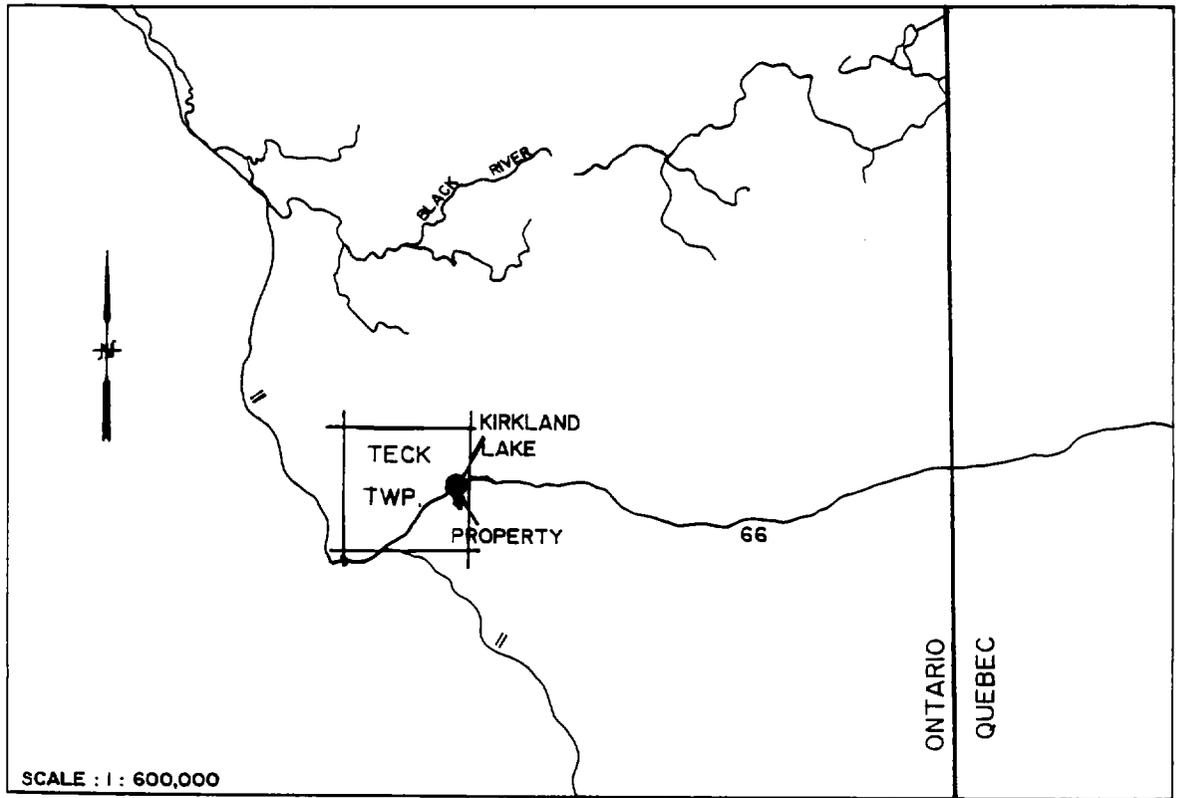


Figure 1(a) : Location Map

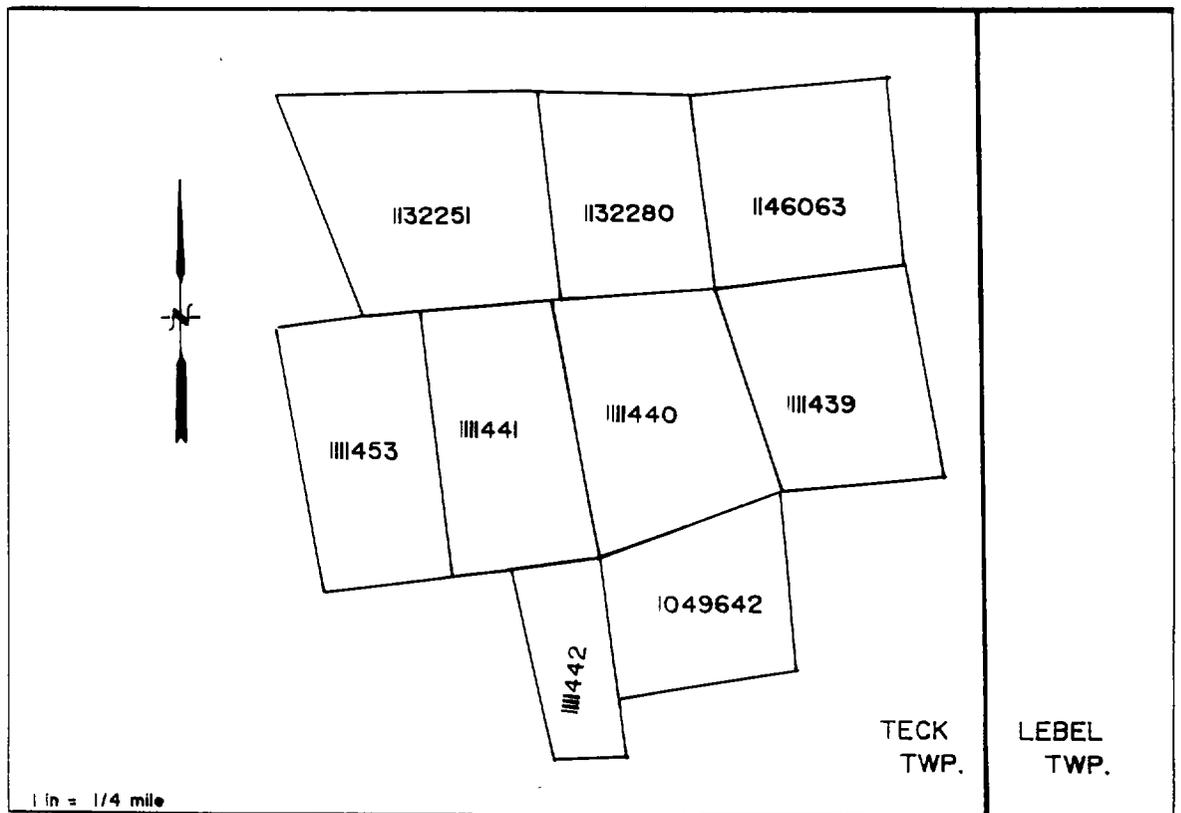


Figure 1(b) : Claim Map

The geology of Teck Township is described by Thomson (1950). The northern half of the Rand Property is underlain by sediments and tuffs of the Timiskaming Group which have been intruded by younger Algonian syenite porphyries. The southern half is underlain by basic volcanics, sediments, carbonates and syenite intrusives. The carbonates are associated with the western extension of the Larder Lake Fault zone (Thomson, 1950), which is located along the southern edge of the Timiskaming Group. The Murdock Creek Fault strikes northeast southwest through claim 1132251 to the northwest of the surveyed area. West extensions of the North, Middle and South Harvey faults are believed to cut through the middle of the property. North-south cross faults, which offset veins in some of the principal gold mines to the north, are believed to extent through the property.

PREVIOUS WORK

Early work on the property was carried out by Ontario Kirkland Gold Mines Limited and Montreal Ontario Mines Limited. Ontario Kirkland Gold Mines deepened an old shaft on the property to 450 feet and in 1922, 6496 tons of ore from three levels were milled.

In 1931, Kirkland Gold Rand Limited was organized and worked on the property until 1937. The shaft was extended to 800 feet and five levels were developed. Nine hundred feet east of the main shaft, a winze was sunk from the 800 foot level to a depth of 1436 feet and stations were cut every 125 feet down the winze. In addition to the development work, a total of 11,613 feet of underground diamond drilling was carried out.

In 1944, Kirkland-Hudson Bay Gold Mines and Kirkland Gold Rand Limited joined to form Hudson Rand Gold Mines Limited. In 1946, the new company re-opened the mine for nine months. A program which included drifting, drilling and sampling was carried out on the 675 and 800 foot levels.

The gold mineralization in the deposit is associated with pyrite, chalcopyrite and molybdenite in quartz veins within syenite porphyry and, to a lesser degree, the surrounding sediments.

SURVEY DESCRIPTIONS

The grid on the property consists of a baseline oriented at 71 Azimuth and crosslines cut every 50 metres. Stations were established every 25 metres along the lines. *

The VLF-EM survey was carried out with a Scintrex IGS-2/VLF-4. This instrument measures the horizontal field strength and the in-phase and quadrature components of the vertical field. The transmitter station used was Cutler, Maine which operates at a frequency of 24.0 kHz. Readings were taken every 12.5 metres.

The magnetic readings were taken with a Scintrex IGS-2/MP-4. This instrument is a proton precession magnetometer which measures the earth's total magnetic field to an accuracy of 0.1 gammas. Diurnal variations were monitored every 20 seconds with a Scintrex MP-3 base station magnetometer. The magnetic readings were taken every 6.25 metres along the survey lines.

* - Northland Technical Surveys of Kirkland Lake cut this grid.

VLF-EM RESULTS

The in-phase and quadrature results are profiled on map 1 and the Fraser filtered in-phase data is contoured on map 2; the scale on both maps is 1:2500.

The VLF results in the northern half of the property are dominated by the response from a northeast southwest striking power line. Two other power lines in the northeast corner of the survey area also gave strong anomalies.

All of the other VLF anomalies on the property are situated at the edge of swamps. These anomalies are likely due to current gathering at the swamp/bedrock interface rather than a bedrock source. Faults, which are coincident with some of these anomalies, have been interpreted mainly because of the sudden change in topography rather than the presence of the anomaly.

MAGNETIC RESULTS

The magnetic results are plotted on Map 2 at a scale of 1:2500.

The property can be divided into five magnetic domains which have been identified by Roth (1990) to the west of the property (see map 3).

Domain III is an area of low magnetic susceptibility along the northern edge of the property. The magnetic field is typical of that found over sediments in the region; the irregular shaped magnetic high anomaly on Lines 10800 to 10900 East at 10750 North coincides with a syenite porphyry, mapped by the Ontario Department of Mines (map 1945-1). The southern edge of this area is marked by a linear magnetic low, interpreted as a zone of alteration.

The shaft on the property is located within this domain at approximately 10725 North, 10425 East. It is at the edge of an area of slightly higher magnetic field covering the end of Lines 10200 to 10400 East. This response, along with a similar one at approximately 10650 North on Lines 10550 to 10700 East, may reflect syenite intrusives at depth.

Domain V is located to the south of Domain III and is defined by a series of continuous linear magnetic highs which strike east northeast. The source of these anomalies is believed to be units of tuff, interbedded with conglomerates and greywackes. Breaks in the magnetic anomalies are due to intrusives and faulting. The widest gap is a magnetic low which strikes north northeast between Lines 10250 and 10600 East; this may be due to strike faults which swing to the north northeast in this area.

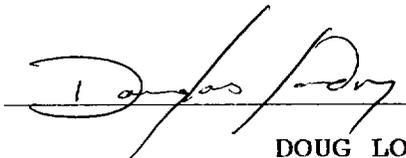
Domain VI, located to the south of Domain V, is a 200 metre wide area in which the magnetic field uniformly decreases to the south. This gradient is likely due to tuffs in Domain V dipping to the south. The area coincides with low swampy ground and is bounded to the north and south by VLF anomalies.

Domain IX is characterized by isolated, irregular shaped magnetic highs. Two areas of high magnetic anomalies at approximately 10050 North on Lines 10550 to 10900 East and Lines 10100 to 10250 East coincide with mafic volcanics indicated on map 1945-1. Other weaker anomalies coincide with carbonate rocks.

The south edge of this domain is marked by a broad northeast to east northeast striking magnetic low. This feature may be related to the western extension of the Larder Lake Fault.

Domain X is located along the southern edge of the property. Although the anomalies in this area are similar in nature to those in Domain IX, they are interpreted to reflect small syenite bodies.

MAR. 5/91
DATE


DOUG LONDRY
TIMMINS GEOPHYSICS LTD.

REFERENCES

- Roth, J., 1990
Report on a Magnetometer Survey, Amalgamated Kirkland
Property, Kirkland Lake, Ontario (company report).
- Thomson, J.E., 1950
Geology of Teck Township and the Kenogami Lake Area, Kirkland
Lake Gold Belt, Ontario Department of Mines Annual Report
for 1948, Vol 57, Part 5.



Ontario

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Mining Lands Section
159 Cedar Street, 4th Floor
Sudbury, Ontario
P3E 6A5

Telephone: (705) 670-7264
Fax: (705) 670-7262

Your File: W. 9108.00128
Our File: 2.14021

June 17, 1991

Mining Recorder
Ministry of Northern Development
and Mines
4 Government Road, East
Kirkland Lake, Ontario
P2N 1A2

Dear Sir/Madam:

RE: Notice of Intent dated May 17, 1991 for Geophysical
(Electromagnetic and Magnetometer) Surveys on mining
claims L.1049642 et al. in the Township of Teck.

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,

Ron. C. Gashinski,
Provincial Manager, Mining Lands
Mines & Minerals Division

cdj
CDS/jl

Enclosures:

cc: Battle Mountain (Canada Inc.)
Toronto, Ontario

Mr. Doug Londry
South Porcupine, Ontario

Mr. W. Benham
Kirkland Lake, Ontario

✓ Assessment Files Office
Toronto, Ontario

Resident Geologist
Kirkland Lake, Ontario



Recorded Holder
Battle Mountain (Canada) Inc.

Township or Area
Teck Township

Type of Survey and Method Assessment days credit per claim	Mining Claims Assessed
Geophysical Electromagnetic <u>40.0</u> days Magnetometer <u>20.0</u> days Radiometric _____ days Induced polarization _____ days Other _____ days	L. 1049642 1111439 to 442 incl. 1111453 1146063
Section 77 (19) See "Mining Claims Assessed" column Geological _____ days Geochemical _____ days	
Man days <input type="checkbox"/> Airborne <input type="checkbox"/> Special provision <input checked="" type="checkbox"/> Ground <input checked="" type="checkbox"/>	
<input type="checkbox"/> Credits have been reduced because of partial coverage of claims. <input type="checkbox"/> Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

L.1132280: 30 days Electromagnetic
15 days Magnetometer

No credits have been allowed for the following mining claims

not sufficiently covered by the survey insufficient technical data filed

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.

2.14021

BATTLE MOUNTAIN (CANADA) INC.



March 21, 1991

Mining Lands Section
Ministry Development
and Lands Branch
4th Floor
159 Cedar Street
Sudbury, Ontario
P3E 6A5

Dear Sir:

Re: Technical Report, Subsection 77(9)
Rand Property, Teck Township,
Larder Lake Mining Division

Please find enclosed two (2) copies of a technical report which describes the results of VLF-electromagnetic and magnetometer surveys on the Rand property. A completed Report of Work form has been forwarded to the Mining Recorder in Kirkland Lake.

If there are any questions regarding this report, please contact W. Benham at (416) 867-9815 or (705) 567-4840.

Yours very truly,

BATTLE MOUNTAIN (CANADA) INC.

A handwritten signature in black ink, appearing to read "W. Benham".

W. Benham,
Project Geologist

WB/jac
Encl.
c.c. - Mining Recorder,
Larder Lake Division

FL: KL\RNDWKR1.LT2

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MAR 22 1991

MINING LANDS SECTION



Ministry of Natural Resources

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) VLF & MAGNETOMETER SURVEYS
Township or Area TECK TOWNSHIP
Claim Holder(s) Battle Mountain (Canada) Inc.
390 Bay St., Suite 2910, Toronto, Ont.
Survey Company TIMMINS GEOPHYSICS LTD.
Author of Report DOUG LONDRY
Address of Author P.O. Box 1783, South Porcupine, Ont. PON 1H0
Covering Dates of Survey Jan. 14, 1991 - Feb. 9, 1991
(lincutting to office)
Total Miles of Line Cut 21.712 km

MINING CLAIMS TRAVERSED
List numerically

Table with columns for prefix and number. Contains list of mining claim numbers: 1049642, 1111439, 1111440, 1111441, 1111442, 1111453, 1132251, 1132280, 1146063. Total claims: 9.

If space insufficient, attach list

SPECIAL PROVISIONS CREDITS REQUESTED table with columns for Geophysical and Geological methods and DAYS per claim.

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

Magnetometer Electromagnetic Radiometric
(enter days per claim)

DATE: MAR 4/91 SIGNATURE: [Signature]
Author of Report or Agent

Res. Geol. Qualifications 2. 2289

Previous Surveys

Table with columns: File No., Type, Date, Claim Holder. Multiple empty rows.

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MINING LANDS SECTION

TOTAL CLAIMS 9

OFFICE USE ONLY

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 _____

General _____

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 _____

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations 1768 Number of Readings VLF - 1768 //MAG - 3394

Station interval VLF: 12.5 metres MAG: 6.25 m Line spacing 50 metres

Profile scale VLF - 1 cm = 50

Contour interval 100 gammas

MAGNETIC

Instrument Scintrex IGS-2/MP3

Accuracy – Scale constant .1 gammas

Diurnal correction method Base Station

Base Station check-in interval (hours) 20 seconds

Base Station location and value 10700 EAST - 10650 NORTH
58186 gammas

ELECTROMAGNETIC

Instrument Scintrex IGS-2/VLF-4

Coil configuration Vertical

Coil separation infinite

Accuracy 1 degree

Method: Fixed transmitter Shoot back In line Parallel line

Frequency Cutler, Maine 24.0 kHz
(specify V.L.F. station)

Parameters measured Horizontal field strength in-phase and quadrature components of the vertical magnetic field.

GRAVITY

Instrument _____

Scale constant _____

Corrections made _____

Base station value and location _____

Elevation accuracy _____

INDUCED POLARIZATION

RESISTIVITY

Instrument _____

Method Time Domain Frequency Domain

Parameters – On time _____ Frequency _____

– Off time _____ Range _____

– Delay time _____

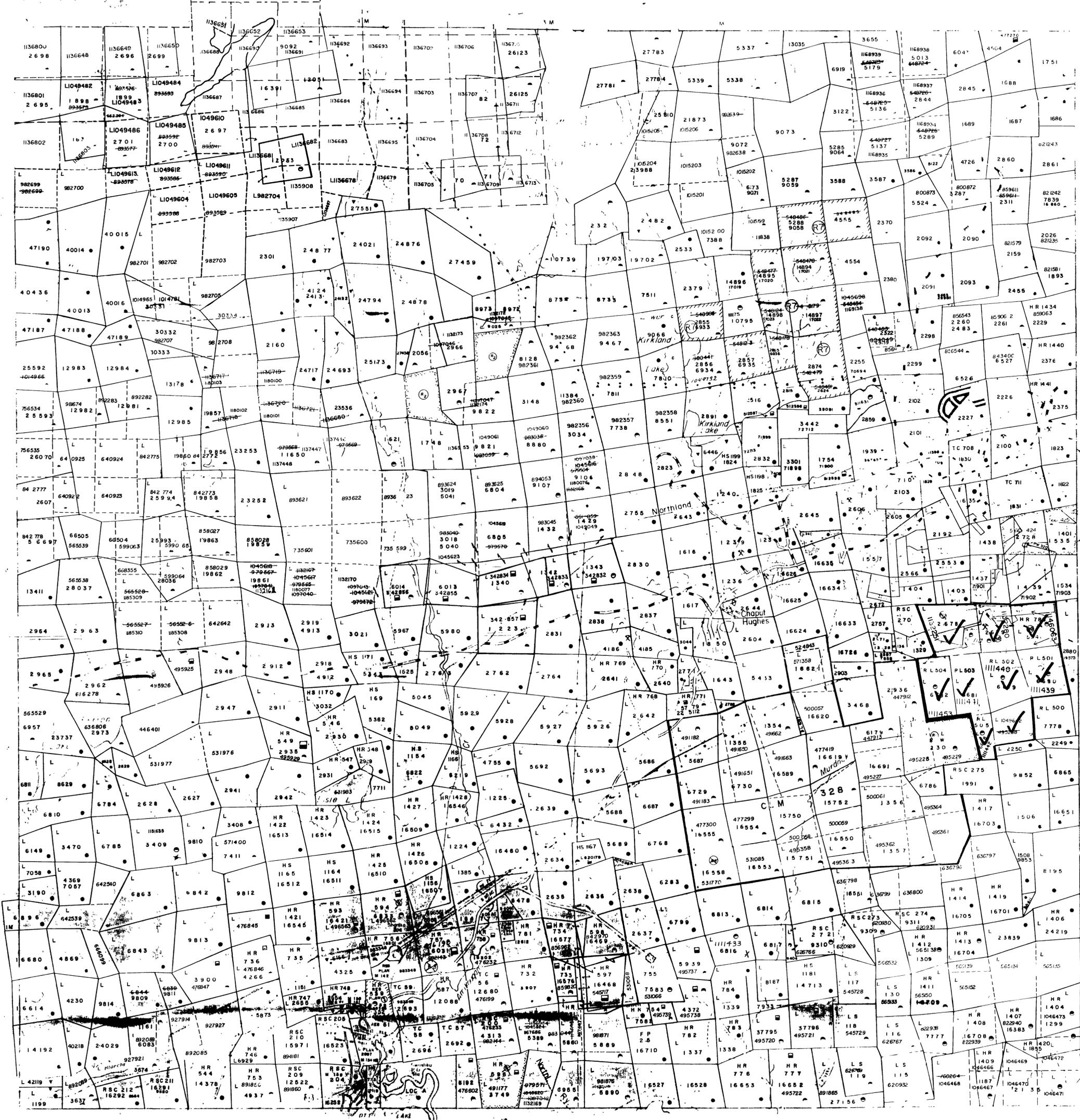
– Integration time _____

Power _____

Electrode array _____

Electrode spacing _____

Type of electrode _____



1 INCH = 20 CHAINS

NOTES

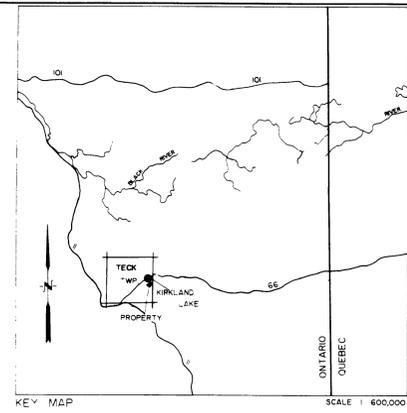
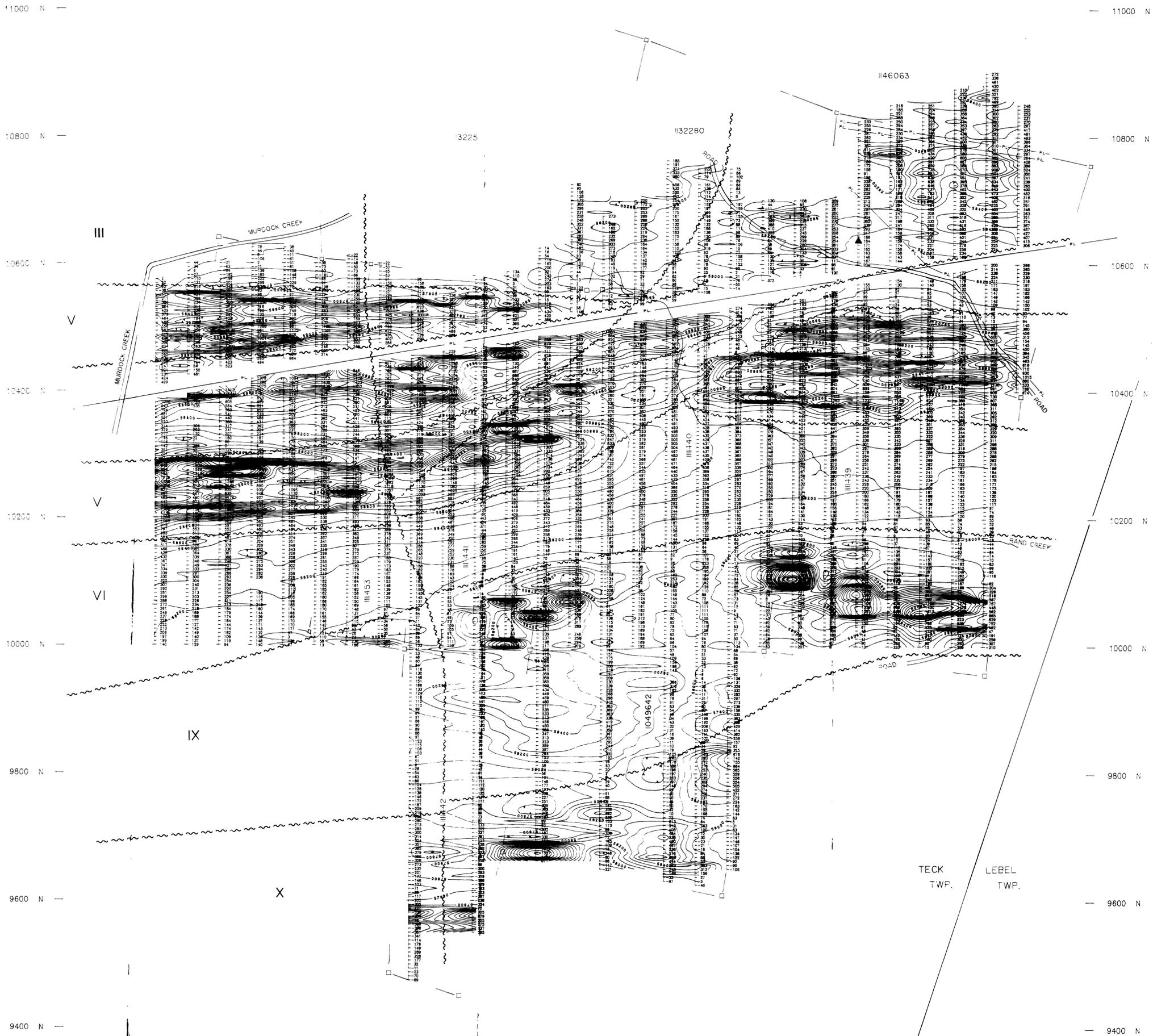
- Areas shown in blue for slime disposal
- Mining claim L 5778 - Mining Rights subject to Sec 36 of the Mining Act (R.S.O. 1950)
- AREAS WITHDRAWN FROM STAKING
- (R) SURFACE RIGHTS WITHDRAWN FROM STAKING SECTION 43/70 ORDER NO W76/80
- (R) SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO W108/82
- (R) SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO W8/86 ORDER NO 0-20/88 OPENS PART W-08/86
- (R) SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO W5/86 ORDER NO 0-22/88 OPENS PART W-05/86
- (R) SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO W18/86 ORDER NO 0-19/90 NR OPENS W18/86 NOV 15/90
- (R) MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO W90/87 NR ORDER NO 0-33/88 OPENS W-90/87
- (R) MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO W-22/88
- (R) MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO W-13/89 NR ORDER NO 0-11/90 OPENS W-13/89 NR

2.4021

DATE OF ISSUE
 JUN 7 1991
 LARDER LAKE
 MINING RECORDERS OFFICE



LINE 9600 E
 LINE 9650 E
 LINE 9700 E
 LINE 9750 E
 LINE 9800 E
 LINE 9850 E
 LINE 9900 E
 LINE 9950 E
 LINE 10000 E
 LINE 10050 E
 LINE 10100 E
 LINE 10150 E
 LINE 10200 E
 LINE 10250 E
 LINE 10300 E
 LINE 10350 E
 LINE 10400 E
 LINE 10450 E
 LINE 10500 E
 LINE 10550 E
 LINE 10600 E
 LINE 10650 E
 LINE 10700 E
 LINE 10750 E
 LINE 10800 E
 LINE 10850 E
 LINE 10900 E
 LINE 10950 E



- ~ ~ ~ Possible Fault
- PL — Power Line
- Compass
- Unlocated
- ▲ Base Station

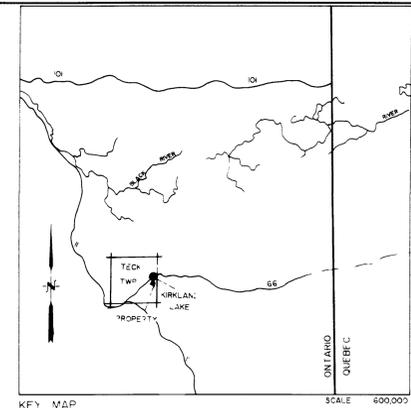
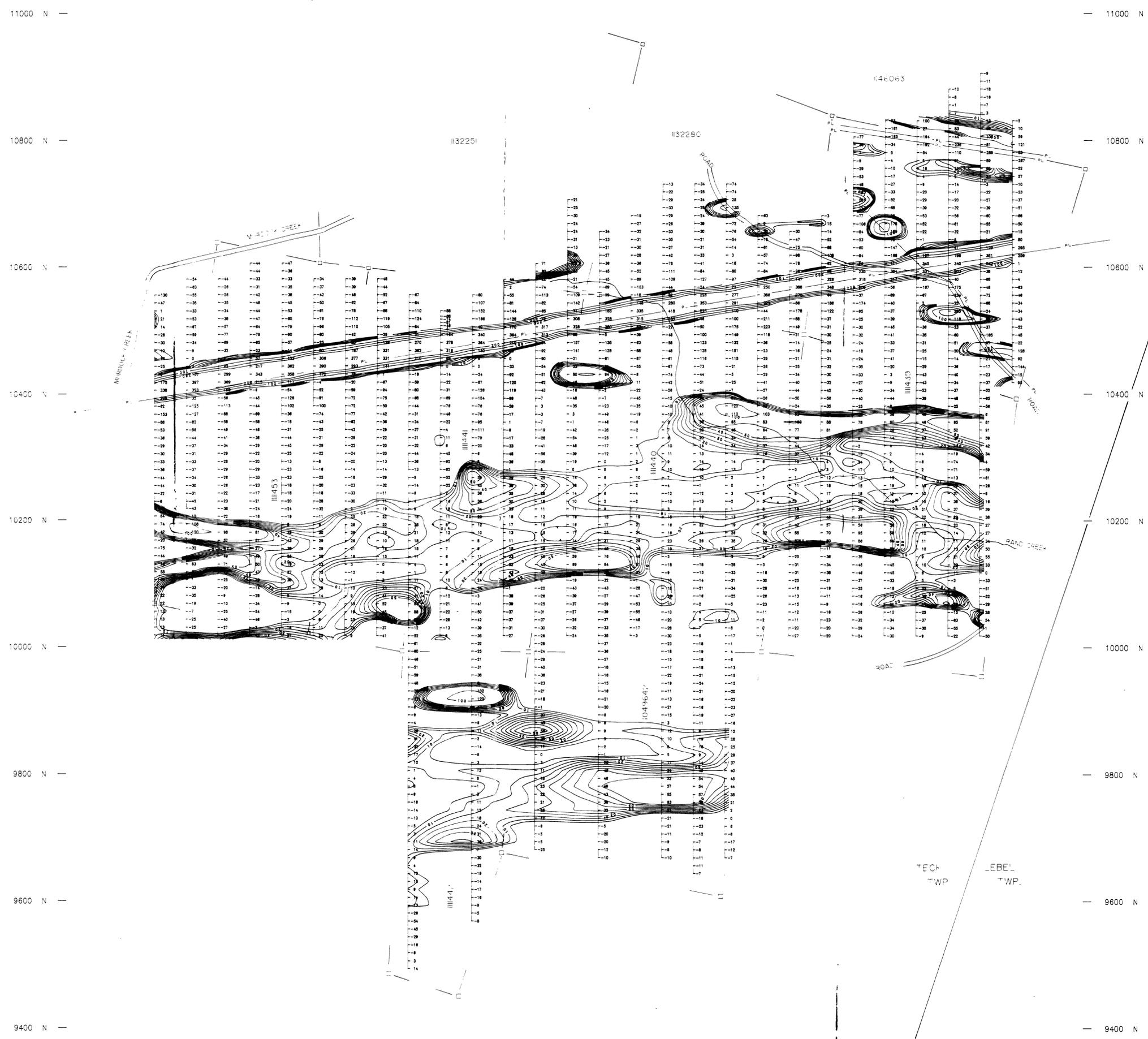
Instrument : Scintrex IGS-2/MP-4
 Type : Total Field Proton Precession
 Contour Interval : 100 gammas
 Datum Level : 58000 gammas

2.14021

BATTLE MOUNTAIN (CANADA) INC.	
MAGNETIC SURVEY	
RAND PROPERTY	
TECK TOWNSHIP	
N.T.S. 42-A/1	DATE : FEBRUARY 1991
SCALE : 1:2500	FILE : RAN.MAG
WORK BY :	<i>[Signature]</i>
Timmins Geophysics Ltd.	



LINE 9600 E
 LINE 9650 E
 LINE 9700 E
 LINE 9750 E
 LINE 9800 E
 LINE 9850 E
 LINE 9900 E
 LINE 9950 E
 LINE 10000 E
 LINE 10050 E
 LINE 10100 E
 LINE 10150 E
 LINE 10200 E
 LINE 10250 E
 LINE 10300 E
 LINE 10350 E
 LINE 10400 E
 LINE 10450 E
 LINE 10500 E
 LINE 10550 E
 LINE 10600 E
 LINE 10650 E
 LINE 10700 E
 LINE 10750 E
 LINE 10800 E
 LINE 10850 E
 LINE 10900 E
 LINE 10950 E



— P — Power line
 □ — Contour
 □ — Unchecked

Instrument : Scintrex IQS-2/VLF-4
 Transmitter Station : Cutler Maine
 Frequency : 24.0 kHz
 Contour Interval : 50

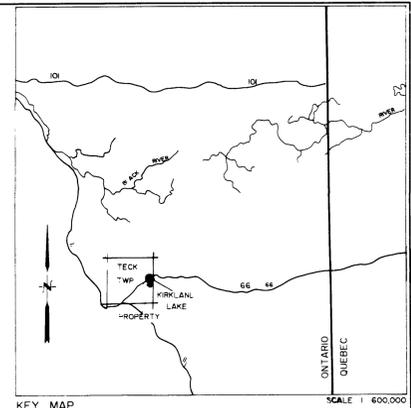
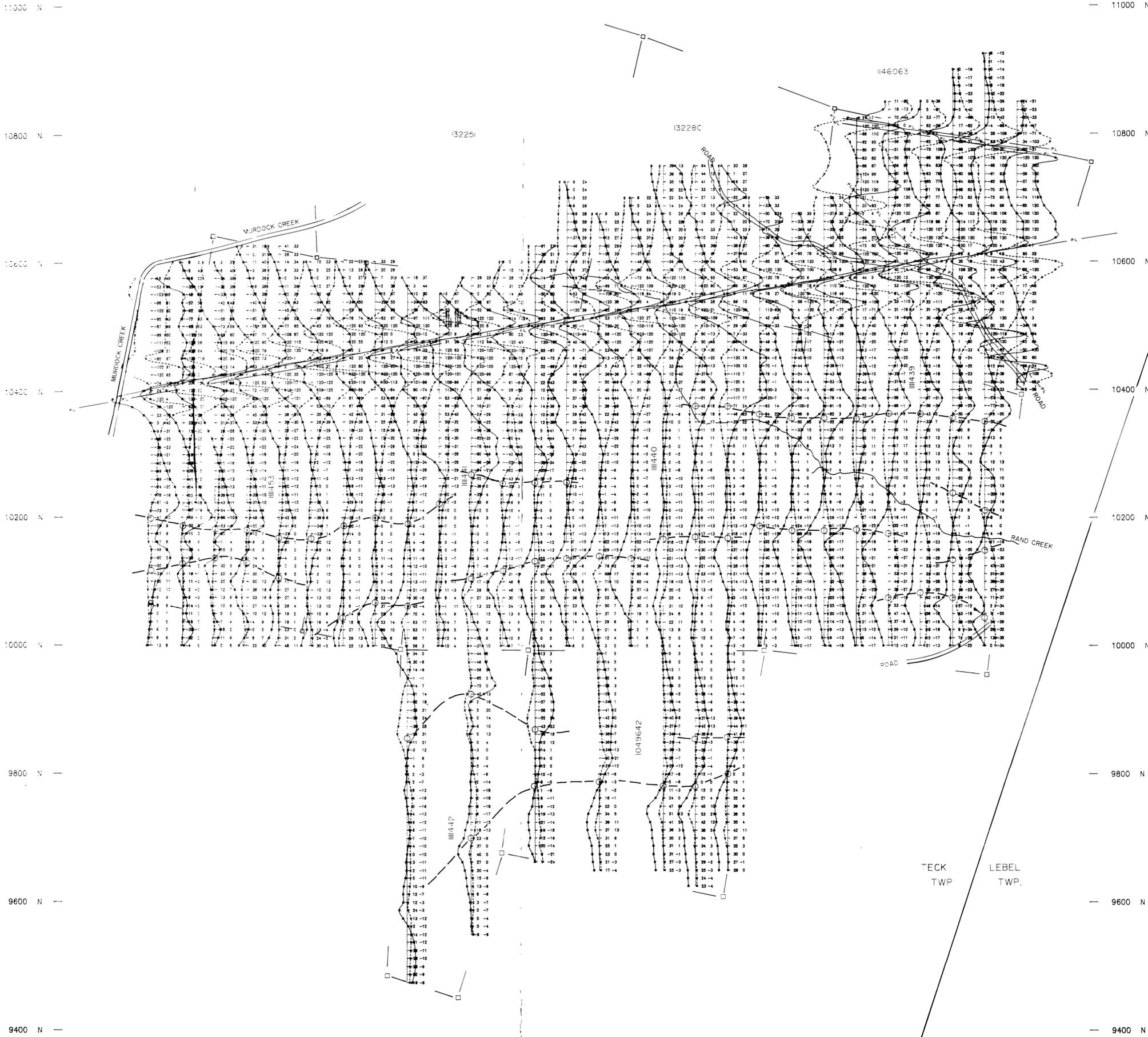
2.14021

BATTLE MOUNTAIN (CANADA) INC.
 VLF SURVEY (Fraser Filtered)
 RAND PROPERTY
 TECH TOWNSHIP

NTS 42-A-1
 SCALE : 1: 2500 DATE : JANUARY 1991
 FILE : RAND.FRA
 WORK BY : *Timmins Geophysics Ltd.*

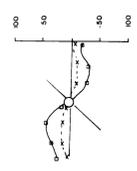


LINE 9600 E
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 LINE 10250 E
 LINE 10300 E
 LINE 10350 E
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 LINE 10450 E
 LINE 10500 E
 LINE 10550 E
 LINE 10600 E
 LINE 10650 E
 LINE 10700 E
 LINE 10750 E
 LINE 10800 E
 LINE 10850 E
 LINE 10900 E
 LINE 10950 E



- P.L. — Power Line
- Anomaly
- Claimposts
- Unlocated

Instrument Scintrex IGS-2/VLF-4
 Transmitter Station Cutler Maine
 Frequency 240 kHz
 Profile Scale 1 cm = 50



In-phase
 Quadrature

2.14021

BATTLE MOUNTAIN (CANADA) INC.
 VLF SURVEY
 RAND PROPERTY
 TECK TOWNSHIP
 NTS - 42-A/1
 SCALE : 1:2500
 DATE : FEBRUARY 1991
 FILE : RAN.VLF
 WORK BY : Timmins Geophysics Ltd.

