



S2C10NE0066 2.7874 BLISS LAKE

010

**REPORT ON AN  
AIRBORNE MAGNETIC AND VLF-EM SURVEY  
BAD VERMILLION LAKE  
KENORA MINING DIVISION, ONTARIO**

for

**Titan Titanium International Inc.**

**RECEIVED**

MAR - 8 1985

**MINING LANDS SECTION**

by

**TERRAQUEST LTD.  
Toronto,**

March 5, 1985

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## 1- INTRODUCTION

A combined airborne magnetic and VLF-EM survey was carried out on a block of 45 claims located in the Bliss Lake - Bad Vermillion Lake Ares, in the Kenora Mining Division, Ontario. The claim holder is Titan Titanium International Inc., Ontario. The work was carried out by Terraquest Ltd., 111 Richmond Street West, Toronto during the period December 4, 1984 to March 3, 1985.

The survey area was covered by a grid of parallel flight lines spaced 100 metres apart and aligned N45°W.

The purpose of the survey was to assist in mapping geology and to explore for shear zones, faults, and other structures potentially favourable to gold or base metal mineralization.

## 2. THE PROPERTY

The property is composed of 45 contiguous claims arranged in a staircase fashion along the north side of Bad Vermillion Lake. Trans-Canada Highway 11 passes to within 2 km of the northern boundary of the property and it may easily be reached by water from the settlement of Mine Centre on Bad Vermillion Lake approximately 6 km to the east.

Latitude and longitude are 48°43' and 92°45' respectively and the NTS reference is 52 C/10.

The claim numbers are: TB 671262-4 / TB 670151-2 ✓  
671266-283 ✓ 715222-236 ✓  
629184-88 ✓ 751057 ✓  
751066

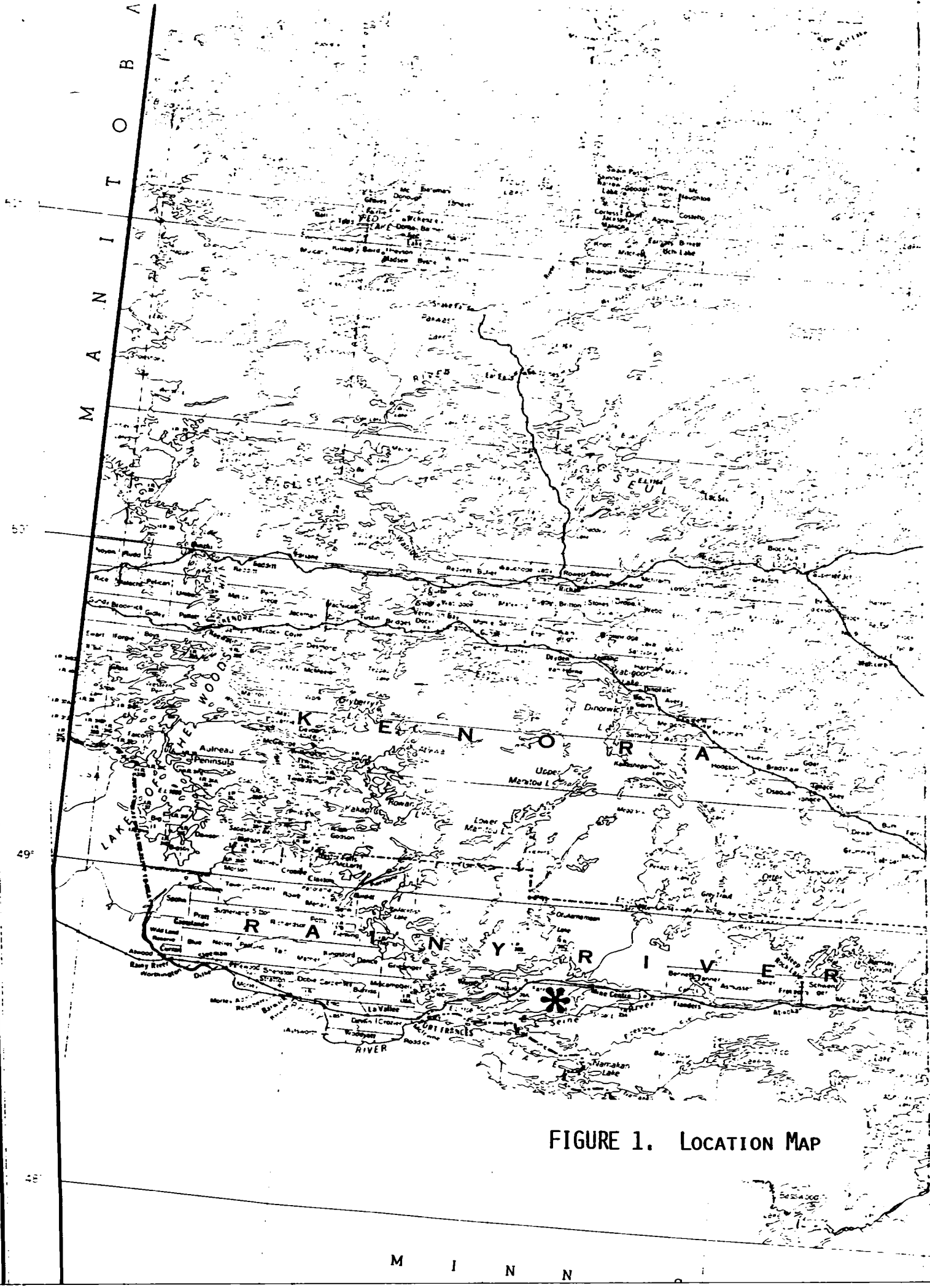


FIGURE 1. LOCATION MAP

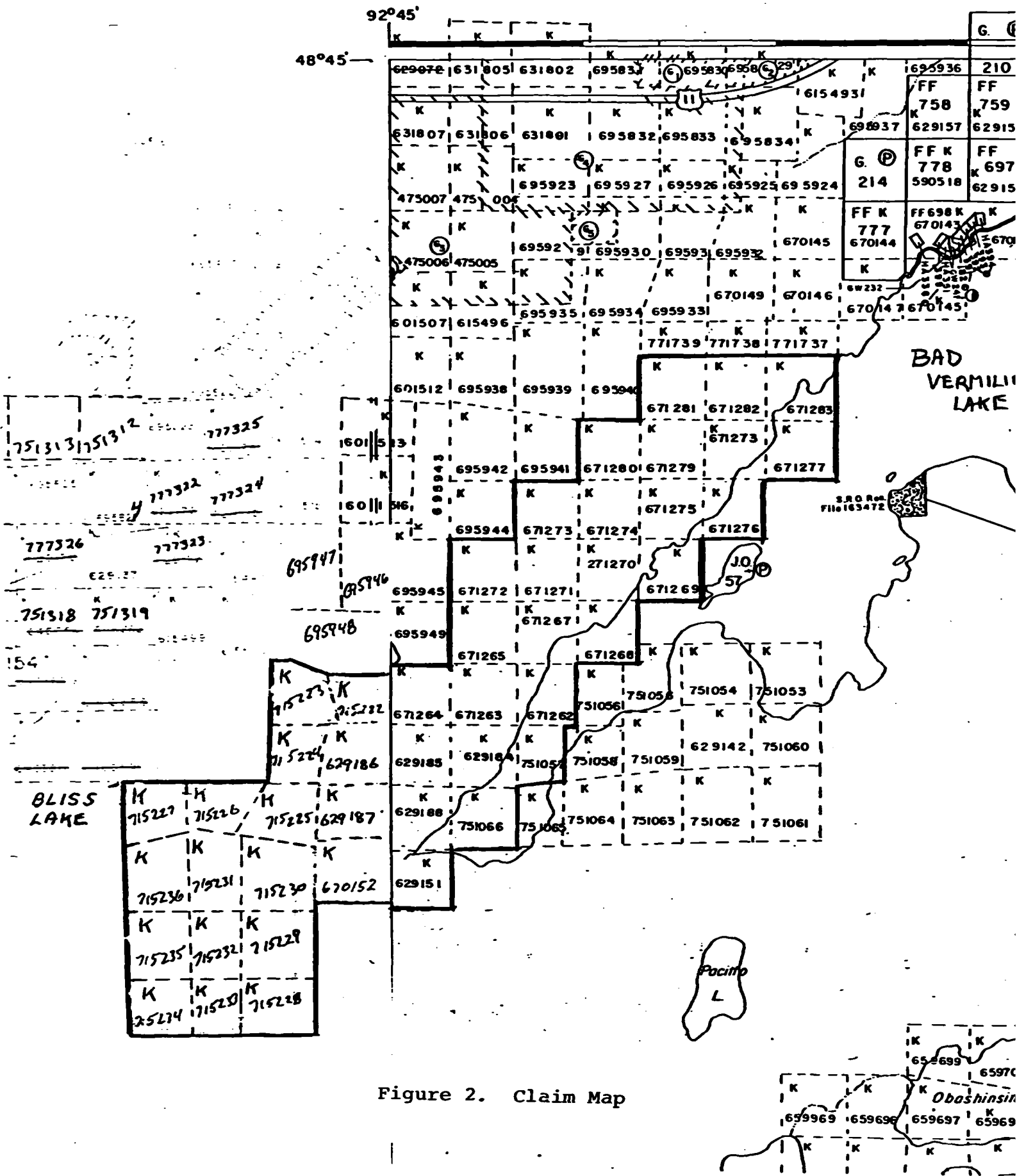


Figure 2. Claim Map

### 3. GEOLOGY

#### Map References

1. P-2201, Mine Centre area, O.G.S., 1:15,840, 1980.

The claim group is underlain by a number of intrusive rock types which have intruded felsic volcanics. The youngest is a gabbro containing approximately 5% magnetite lying along the center of the claim group. Granitic rocks including trondhjemite and granodiorite lie on either side of this formation. A deposit of iron and titanium and vanadium is located on the lakeshore near the center of the claim block. Pyrite occurs within the granodiorite at the north end of the claims.

The economic geology notes on map 2201 state "the most obviously favourable host rock for auriferous quartz veins is the metamorphosed granitic unit; however, the potential of the other rocks, including the gabbroic bodies, should not be discounted".

#### 4. SURVEY SPECIFICATIONS

##### 4.1 Instruments

The present survey was carried out using airborne instruments with the sensor elements mounted in the wing tips of a Cessna 182 aircraft, registration C-FAKK. The magnetic field was measured with a proton precession magnetometer model GSM-8BA, manufactured by GEM Systems, Toronto. The VLF-EM field was measured with a three component total field strength instrument, model TOTEM-2A, manufactured by Herz Industries Ltd., Toronto. Terrain clearance is measured by a King KRA-10A Radar Altimeter. Data from these three instruments are processed by a UDAS-100 data processor, manufactured by Urtec Ltd. and then recorded onto a ninetrack tape recorder, and printed as profiles on a thermal printer in real time on the aircraft (Fig. 3). A Geocam video tape system is used to follow the flight path, and fiducial numbers generated by the UDAS-100 are recorded onto the video images.

Full specifications of the instruments are given in Appendix A.

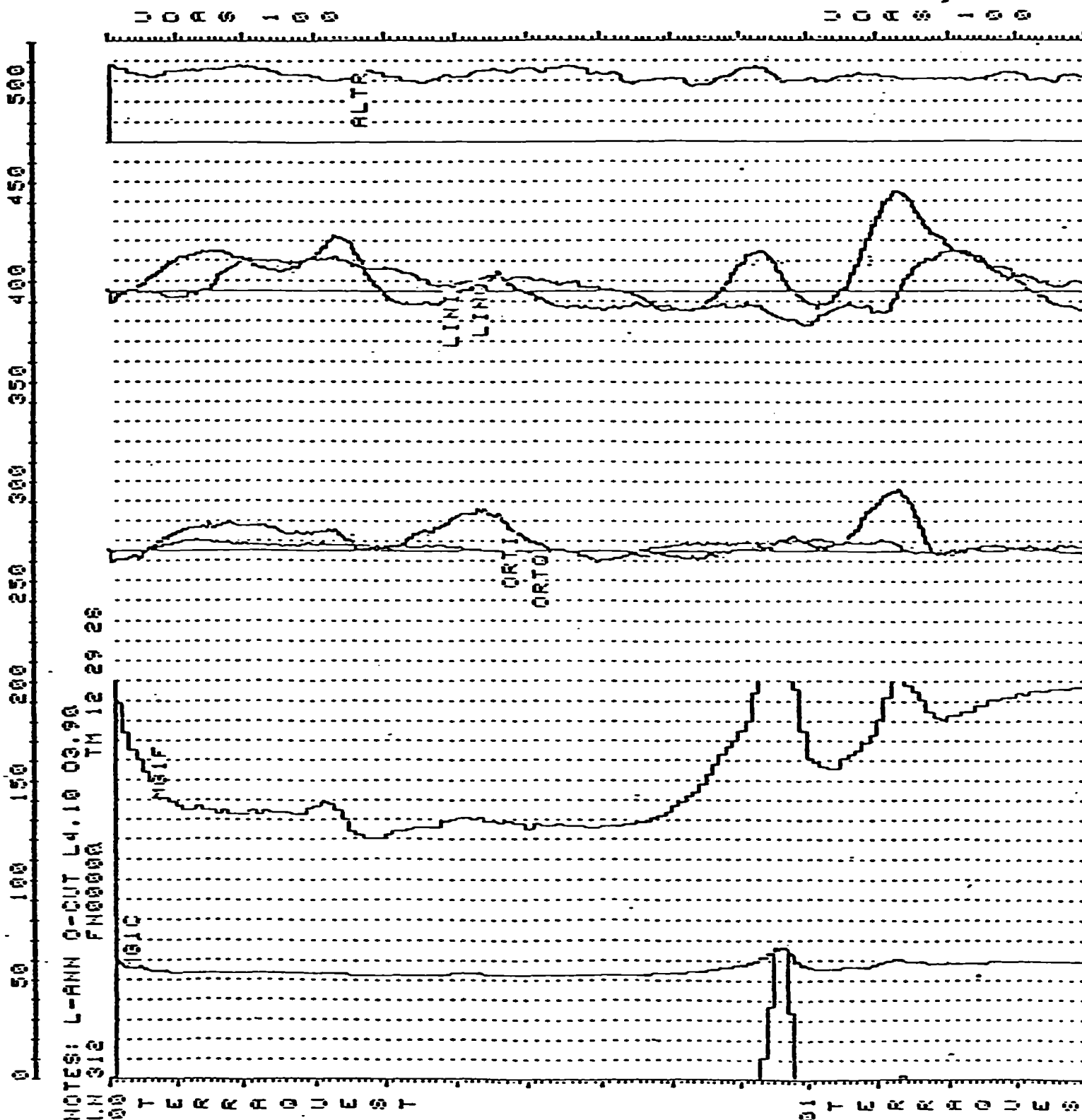


FIGURE 3. SAMPLE OF ANALOGUE DATA



#### 4.2 Lines and Data

- a) Line spacing            100 metres
- b) Line direction        315 degrees (astr.)
- c) Flying height         100 metres
- d) Flying speed         156 km/hr
- e) Data point interval:
  - magnetic        42 metres
  - VLF EM         21 metres
- f) Tie Line interval. 2 kilometres
- g) VLF transmitter tuned in Ch.1 (Line)- Jim Creek, Wa., 24.8 kHz
- h) VLF transmitter tuned in Ch.2 (Ortho) - Cutler, Me., 24.0 kHz
- i) Line kilometres within the claim boundaries - 84
- j) Line kilometres over total survey area - 177

#### 4.3 Tolerances

- a) Line spacing: Any gaps longer than one kilometre and wider than twice the line spacing were reflown.
- b) Flying height: Portions of line longer than one km which were above 125 metres were reflown if safety considerations were acceptable.
- c) Magnetic diurnal: Less than twenty gammas (nanotesla) deviation from a smooth background over a period of two minutes or less as seen on base station analogue record.
- d) Manoeuvre noise: approximately  $\pm 5$  gammas.

#### 4.4 Photo mosaics

For navigating the aircraft and recovering the flight path, photo mosaics were made at final map scale from existing air photos. In order to provide a semi-controlled base the airphotos were laid down on a topographic map which had been photographically adjusted to match the photo scale. The laydown was then photographed and printed at 1:10,000 scale for navigating and flight path recovery.

#### 5.0 Data processing

Flight path recovery was carried out in the field using a video tape viewer to observe the flight path as recorded by the Geocam video camera system. The flight path recovery was completed daily to enable reflights to be selected where needed for the following day.

The remaining data processing was carried out in the offices of Dataplotting Services Inc. in Toronto.

Magnetic levelling was computed in the standard manner by tying survey lines to the tie lines. The VLF-EM data was corrected by applying the following formula:

(A) Total Field Strength

$$V = \frac{SM + 100}{K} \quad \text{where} \quad K = \frac{S(A - 2R) + 100}{100}$$

V = final corrected value in %

M = raw data value from the magnetic tape

S = scale factor

A = average of all M on a given line.

R = standard deviation of A

(B) Quadrature

$$Q = \frac{SN}{K} \quad \text{where} \quad K = \frac{SB + 100}{100}$$

N = raw data

B = average of all N

The vertical magnetic gradient is computed from the total field data using a widely accepted method of transforming the data set into the frequency domain, applying a transfer function to calculate the gradient, and then transforming back to the spatial domain. The method is described by a number of authors including Grant, 1972, and Spector, 1968.

Grant, F. S., Review of data processing and interpretation methods in gravity and magnetics, Geophysics, August 1972.

Spector, A., 1968, Spectral analysis of aeromagnetic maps: unpub. University of Toronto thesis.

These calculations, and all other corrections and map contouring were carried out by Dataplotting Services Inc. of Toronto.

## 6.0 INTERPRETATION

The magnetic contour pattern on both the total field and the vertical gradient clearly defines the magnetite-rich gabbro formation traversing the full length of the claim group. Its contacts with the granitic rocks to the north and the mafic intrusives to the south were mapped using the gradient data. It ranges in width from 200 to 300 metres and contains the showing of titaniferous magnetite. Several lateral displacements of this unit shown on the magnetic map are interpreted as faults.

Several moderate magnetic anomalies at the north end of the claim group are believed to be expressions of the gabbro (Unit 4d) and some of the displacements in these linear anomalies can be related to the proposed faulting in the iron-rich gabbro unit to the south. The granodiotite, the mafic intrusives to the south and the felsic volcanics to the north have very little magnetic expression and cannot really be distinguished from each other.

The VLF data shows a number of electrical conductors on the property. In the western half near the north boundary, two strong conductors can be related directly to Bliss Lake and are believed

to be caused by lake bottom sediments. However, the entire length of the iron-rich gabbro unit is conductive. This could be caused by the magnetite alone or by the combination of magnetite and sulphide minerals. Investigation on the ground would be needed to resolve this by means of conventional electromagnetic or induced polarization methods. One short weak VLF anomaly lies in the west part of the claims near a pyrite occurrence and could be an expression of this mineral. It is recommended that this anomaly and the strongest anomalies within the iron-rich gabbro would be investigated further on the ground.

#### 7. SUMMARY

The claim group was covered by a magnetic VLF-EM readings at a density of approximately 1 mile per mineral claim. The iron-rich gabbro and other gabbro units were carefully mapped from the magnetic data and a number of faults are proposed. The iron-rich gabbro was found to be conductive at VLF frequencies and recommendations were given for further investigation of this long anomaly on the ground.

TERRAQUEST LIMITED



Roger K. Watson, B.A.Sc., P.Eng.  
Geophysicist

62-5A

**APPENDIX A**

# GSM - 8 BA AIRBORNE PROTON MAGNETOMETER

## SPECIFICATIONS

**Resolution:** 0.5 gamma

**Accuracy:** + 1 gamma over operating range

**Range:** 20,000-100,000 gamma in 23 overlapping steps

**Gradient Tolerance:** Up to 5,000 gamma/meter

**Output:** VISUAL: 5 digit 1 cm (0.4") high Liquid Crystal Display, visible in any ambient light  
DIGITAL: Multiplied precession frequency and gating pulse  
ANALOGUE: 0-99 gamma (optional)

**External Trigger:** Externally triggered cycling with period of 1.00 sec.

**Power Requirements:** 28V DC, 8Ws per reading

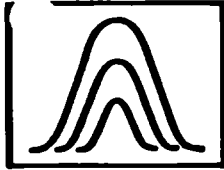
**Operating Temperature:** -40 to +55C

**Dimensions:** Console: 15x8x15 cm (6x3 $\frac{1}{4}$ x6")  
Sensor: 14x7 cm dia (5  $\frac{3}{4}$ x2  $\frac{3}{4}$ " dia)  
Staff: 175 cm (70") extended, 53 cm (21") collapsed or sectional 45 cm (18") each section

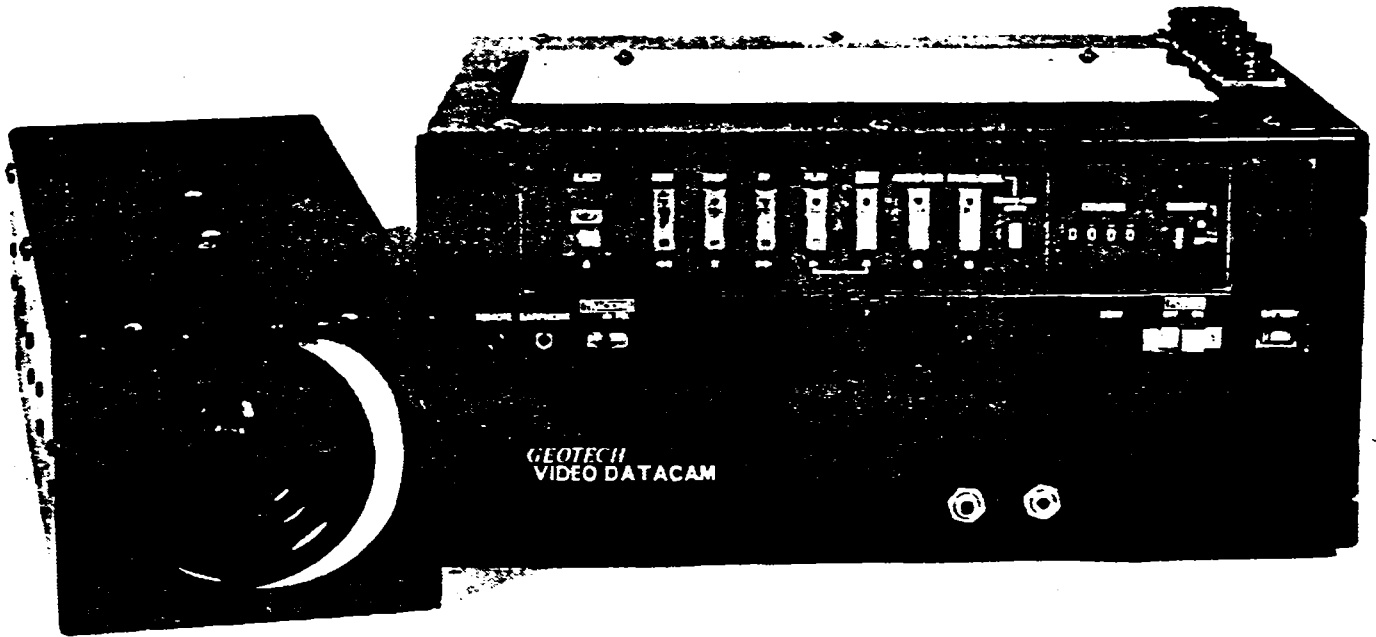
**Weight:** 2.7 kg (6 lb) complete, 2.3 kg (5 lb) in back-pack mode

**Manufacturer:** Gem Systems Inc.  
105 Scarsdale Rd.  
Don Mills, Ontario M3B 2R5

# Geotech



## Geotech Datacam Video Flight Recorder System



The Geotech Datacam System provides an innovative method of recording the flight path together with data from the user's acquisition equipment on video cassette tape instead of the usual 35 mm film. The system consists of a data interface, video camera and a video cassette recorder. All data and video are available for review immediately after each flight since no processing is required. The B&W video camera is fitted with a super wide angle lens and automatic iris for accurate exposure control, even under low light conditions, with no operator adjustment. Usable video can be obtained with only 0.1 foot candles of light.

The video cassette recorder is designed for easy loading and can store data such as real time, day and date, fiducial numbers, values of magnetometer, VLF and other information on the top portion of each frame. All data and video images are available for immediate review after each flight without processing. Each cassette provides two hours of recording time when run at normal speed. Longer recording times are available with some sacrifice in resolution. Interfacing Datacam to the data acquisition system of the user will be required.

### Features

- Datacam pays for itself in one season due to savings in film
- Reusable magnetic tape cassettes
- Instant playback in field giving total confidence in data recorded
- Same weight as conventional 35 mm film equipment
- Automatic exposure control
- Super wide angle lens
- On board video monitor
- Selection of normal or low tape speeds

### Specifications

Weight	8.5 kg camera and recorder
Size	9 x 11 x 26 cm for camera 14 x 25 x 29 cm for recorder
Lens	5.5 cm super wide angle with automatic iris
Temperature range	0 to 40° C
Format	VHS B&W
Power requirements	28 Vdc, 2A

Specifications subject to change without notice.



# Totem 2A

Multi channel

VLF Electromagnetic  
airborne survey instrument

Specifications

## Introduction.

The Totem-2A measures basically the same parameters and shares the same package configuration as the well established Totem-1A.

This new generation instrument, however, measures multiple parameters on two channels simultaneously, with less noise and greater accuracy. These advancements have been achieved while maintaining the simple installation and operating procedures of the 1A model.

The Totem-2A employs state of art digital and linear integrated circuits to implement the functions of crystal controlled phase locked loop frequency synthesizers, dual frequency heterodyne conversion and proprietary time domain sampling vector computation techniques.

## Features.

The principal parameters measured are the change in total field and the vertical quadrature field. Parameters also available are the total field gradient (from sensors in two locations) and the horizontal quadrature field. The quadrature polarity is defined by the direction of flight relative to the field. The total and quadrature magnitudes are insensitive to sensor orientation in pitch, roll and yaw.

One obvious advantage of dual frequency operation is that primary sources can be selected to ensure good coupling with conductors of any orientation. Potential uses of the gradient mode are enhanced interline contouring and delineation of multiple conductors with horizontal and vertical gradient respectively.

Specifications subject to change.

**Primary source:** Magnetic field component radiated from VLF radio transmitters (one or two simultaneously).

**Parameters measured:** Total field, vertical quadrature, horizontal quadrature, gradient.

**Frequency range:** 15kHz to 250kHz front panel selectable for each channel in 100Hz steps.

**Sensitivity range:** 130uV/m to 100mV/m at 20kHz, 3dB down at 14kHz and 24kHz.

**VLF signal bandpass:** -3dB at  $\pm 80$ Hz,  $< 4\%$  variation at  $\pm 50$ Hz.

**Adjacent channel rejection:** 300 to 800Hz = 20 to 32dB, 800 to 1500Hz = 32 to 40dB,  $> 1500$ Hz  $> 40$ dB (for  $< 2\%$  noise envelope).

**Out of band rejection:** 10kHz to 2.5kHz =  $5 \times 10^{-4}$  A/m to  $5 \times 10^{-1}$  A/m  $< 2.5$ kHz rising at 12dB/octave  
30kHz to 60kHz =  $5 \times 10^{-4}$  A/m to  $8 \times 10^{-3}$  A/m  $> 60$ kHz rising at 6dB/octave (for no overload condition).

**Output span:**  $\pm 100\% = \pm 1.0$ V

**Output filter:** Time constant 1sec for 0 to 50% or 10% to 90%, noise bandwidth 0.3Hz (second order LP).

**Internal noise:** 1.3uV/m rms (ambient noise will exceed this).

**Sferics filter:** Reduces noise contribution of impulse interference.

**Electric field rejection:**  $< 0.5\%$  error for 20m tow cable.

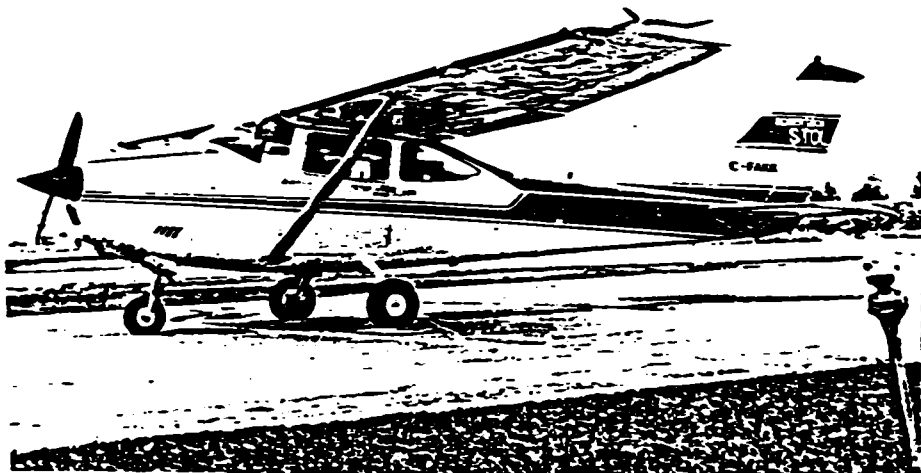
**Controls:** Power switch, frequency selector switches (line & ortho) level controls (line & ortho), meter switch (total/quad) sferics filter switch.

**Displays:** Meters (line & ortho), sferics light, overload light.

**Inputs:** Power, 23 to 32 Vdc fused 0.5Amp.  
Signal, Sensor upper, Sensor lower.

**Outputs:** Total, quad, gradient, multiplexed (line & ortho).  
Audio monitor, stereo line & ortho.

**Dimensions & weight:** Console 19" rack mounted, 4.5cm high x 34cm deep, 3.8kg. Sensor and pre-amplifier assembly 15cm dia. and 46cm long, 1.5kg.



Herz Industries Ltd.  
197 Fenn Avenue  
Willowdale/Ontario  
M2P 1Y1  
Tel: (416) 221-8908



Manufacturers  
of geophysical  
instruments

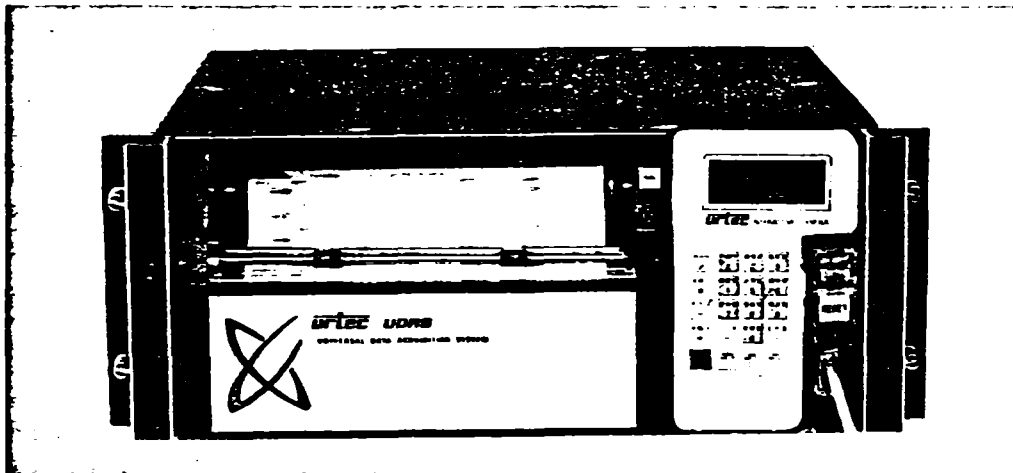
**URTEC**

UNIVERSAL DATA ACQUISITION SYSTEM

# UDAS 100

## FEATURES

- **INTEGRATED GEOPHYSICAL MULTI SENSOR SYSTEM DESIGN**
- **SYSTEM CAN MEASURE, COLLECT, RECORD, VERIFY, REPLOT AND PROCESS A VARIETY OF GEOPHYSICAL DATA.**
- **ANALOG AND DIGITAL RECORDING COMBINED IN ONE COMPACT LIGHTWEIGHT CONSOLE.**
- **PROGRAMED AS A COMBINED DATA ACQUISITION SYSTEM OR AS A FULLY INTEGRATED AIRBORNE SURVEY SYSTEM INCLUDING SPECTROMETER AND MAGNETOMETER.**
- **INTELLIGENT INTERACTIVE HAND HELD TERMINAL WITH KEYBOARD AND DISPLAY CAN BE FIXED TO CONSOLE OR OPERATED IN A REMOTE POSITION.**
- **LIGHTWEIGHT, COMPACT AND LOW POWERED.**



up to 14 crystal detectors in a coincidence or anti-coincidence mode. It also includes a proton magnetometer featuring automatic tuning with 0.1 gamma sensitivity. The system can also be programed to process the signal or frequency from cesium and fluxgate magnetometers.

All functions are controlled via a hand held terminal with keyboard and a 24 alphanumeric character display. The terminal can be fixed to the console or operated in a remote position.

The Universal Data Acquisition System, or UDAS, is the most advanced and versatile programable data acquisition system available for ground and airborne geophysical survey applications. This small, lightweight system will accept data in virtually any format — analog or digital, serial or parallel — from any number of simultaneous sensors and sources.

The UDAS combines both digital and analog recording functions into a single compact lightweight console. All recorded data can be simultaneously registered on any 9-track magnetic tape unit as well as being recorded in analog form on an internal printer/recorder. The printer/recorder operates under software control, it can register up to 16 separate traces with total flexibility as to channel width and position.

The UDAS can be supplied as a combined digital/analog recording system or as a fully integrated geophysical survey system. With the addition of an interface and control console the UDAS is programed to handle a dual (upward/downward) full spectrum gamma ray spectrometer capable of accommodating

The system inputs and outputs include a 24 character alphanumeric display, 2 RS232 input/output ports, 16 input analog channels, 30 separate input/output ports and 56 input/output lines for BCD and binary data, 3 accumulator inputs for frequency and pulse counting and a CPIB - IEEE-488 high speed data BUS. Optional features include an interface to dual floppy disk converting the basic UDAS to a software development or data processing system.

The system can be interfaced to any number of recording devices such as magnetic tape drive, external chart recorder, cartridge tape drive, CRT display and plotter/printer.

In addition to its main function as a lightweight, compact data acquisition system for airborne geophysics, the versatility of the UDAS hardware and software makes it suitable for a variety of additional applications such as marine geophysics, truckborne geophysics, field editing tape copy and processing, base station monitoring, borehole logging, environment and industrial monitoring as well as a stand alone software development system.

# URTEC MODEL — UDAS-100

## SPECIFICATIONS: UNIVERSAL DATA ACQUISITION SYSTEM URTEC MODEL — UDAS-100

### BASIC UDAS

#### MICROPROCESSOR AND MEMORY:

- Texas Instruments TMS 9900 - 16 BIT with built in multiply and divide hardware.
- Total memory expandable to 32k words.
- Basic system contains:
  - 16k - 16 bit word RAM
  - Up to 8k - 16 bit word EPROM
  - Cartridge program loading
  - 12k - Bytes of non volatile RAM program storage (optional)

#### INPUTS AND OUTPUTS

- Analog input: 16 differential input channels with 12 bit resolution at  $\pm 5V$  full scale
- Analog output - up to 16 channels (optional)
- 30 addressable ports for multiple byte transfer
- 56 input/output lines for BCD and binary data information (transferred in multiples of 8 bit bytes)
- 3 pulse accumulator inputs for frequency and pulse information. (eg. — Doppler navigation and radar altimeter).
- 2 digital spectrometer inputs. (eg. upward and downward detectors selectable at 256 or 512 channels)
- 1 RS 232 serial port for interactive keyboard and display
- 1 RS 232 serial port for addition of CRT floppy disks and other terminals.
- 1 same protocol as RS 232 with TTL level
- 1 operator controlled fiducial input (switch or keyboard activated)
- Y output for graphic display on oscilloscope
- High speed data transfer-lines GPIB — IEEE-488 compatible

#### INTERFACES:

- Magnetometer control and signal input for proton or cesium magnetometers
- Error condition indicator level for remote monitoring of diagnostic tests
- Controller and outputs for two 9 track  $\frac{1}{2}$  inch magnetic tape units
- Printer/Recorder controller
- Digital interface to navigation camera (8 digits of fiducial and coding information)
- Controller for magnetic tape cartridge (program loader)
- Disk storage interfaced via RS-232 or GPIB — IEEE-488 BUS

#### CONTROLS:

- System power on/off switch
- Keyboard with 24 character alphanumeric display.
- Keyboard/display can be operated on main console or remotely
- Manual start and load of Julian clock and fiducial numbers
- All control functions interrogate with YES or NO answer.

#### SOFTWARE:

The basic system is supplied with the necessary programs (on magnetic cartridge) to execute routine operational functions and standard survey requirements. Additional dedicated programs are also included to provide:

- Spectrometer Calibration
- Automatic resolution check
- Full spectra printout on recorder/printer
- Continuous monitoring of system gain using natural "K" photopeak
- Automatic window adjustments
- Fast total count sampling (0.1 sec) for point sources resolution.
- Selective graphic display options.
- Read after write data verification.
- Selective data tape dump
- Magnetic tape copy (optional)
- Data processing and plotting program (optional)
- Diagnostic test programs
- A variety of additional special functions programs are available on request.

### PRINTER/RECORDER

#### CONTROLS

- Power on/off switch
- Automatic paper feed
- Print contrast control
- On/off print head control
- Automatic take-up spool

#### FORMATS

- Alphanumeric, complete ASCII character set. Thermal 5 x 7 dot matrix
- Graphics 70 x 70 dots per inch resolution
- Software programable under UDAS control
- Records up to 16 analog traces each with variable O and F.S. setting. Traces can be stacked or overlapping. Software controlled. Trace position and amplitude can be adjusted via interactive keyboard.
- Overflow is automatic by digital stepping.
- Complete alphanumeric annotations can be printed on recording chart (eg. name of project and survey area details, fiducial numbers, time, recording scales and parameters etc.)

#### PAPER

- Thermosensitive paper 222mm (8.75 in.) wide, 30 meter (100 ft.) long
- Thermal print head is board mounted and easy to replace

#### POWER

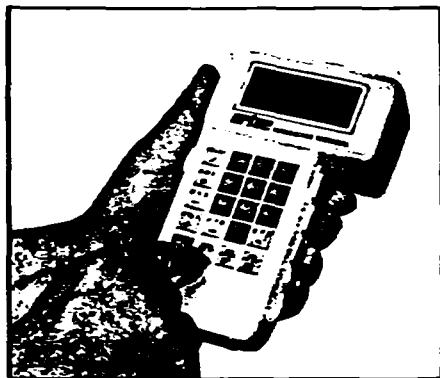
- 24 - 28VDC 3.0 A average

#### WEIGHT

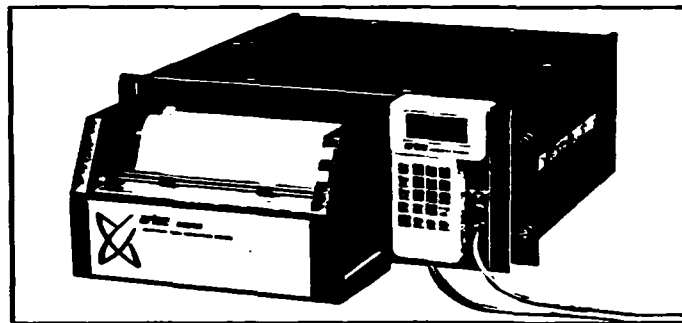
- 15.6 kg. 35 lbs.

#### DIMENSIONS

- 48.2 cm (19 in.) wide, 17.8 cm (7.0 in.) high, 40.6 cm (16 in.) deep (standard rack mount).



Hand Held Interactive Terminal



UDAS-100 Console with Printer/Recorder Extended

FOR FURTHER INFORMATION CONTACT

**urtec**

**INSTRUMENTS SALES LIMITED**

131 TELSON ROAD, MARKHAM (TORONTO) ONTARIO CANADA L3R 1E4 • TELEPHONE (416) 475-1133 TELEX 06-986677 CABLE: "URMARK"



52C10NE0066 2.7874 BLISS LAKE

900

Mining Lands Section  
Control Sheet

File No 2.7874

TYPE OF SURVEY        **GEOPHYSICAL**  
                                     **GEOLOGICAL**  
                                     **GEOCHEMICAL**  
                                     **EXPENDITURE**

**MINING LANDS COMMENTS:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ *10/24*

*AD*

*Deery*  
**Signature of Assessor**

*10/04/85*  
**Date**



Ministry of  
Natural  
Resources

**Report of Work**  
(Geophysical, Geological,  
Geochemical and Expenditures)

*FWM*

- Instructions: - Please type or print.  
- If number of mining claims traversed exceeds space on this form, attach a list.  
Note: - Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.  
- Do not use shaded areas below

*Map # 11-85*

**Mining Act**

Type of Survey(s): **ELECTROMAGNETIC & MAGNETOMETER (AIRBORNE)** Township or Area: **AREA OF BAD VERMILION LAKE**  
 Claims Holder(s): **TITAN TITANIUM INTERNATIONAL INC.** **AREA OF BLISS LAKE G-2668**  
 Address: **COMMERCIAL UNION TOWER, SUITE 2302,** Prospector's Licence No.: **G-2668**  
**TORONTO DOMINION CENTRE, P.O. BOX 62, TORONTO, ONT. M5K 1E7**  
 Survey Company: **TERRAQUEST LTD** Date of Survey (from & to): **12 84 20 12 84** Total Miles of line Cut:  
 Name and Address of Author (of Geo Technical report): **ROGER WATSON**

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

Special Provisions	Geophysical	Days per Claim
For first survey Enter 40 days. (This includes line cutting)	Electromagnetic Magnetometer	
For each additional survey using the same grid Enter 20 days (for each)	Radiometric Other	
	Geological Geochemical	

**RECEIVED**  
FEB 03 1985

Mar. Days	Geophysical	Days per Claim
Complete reverse side and enter total(s) here	Electromagnetic Magnetometer Radiometric Other	
	Geological Geochemical	

Airborne Credits	Geophysical	Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic Magnetometer Radiometric	<b>40</b> <b>40</b>

**Mining Claims Traversed (List in numerical sequence)**

Prefix	Mining Claim Number	Expend. Days Cr.	Prefix	Mining Claim Number	Expend. Days Cr.
K	629184	80	K	671279	80
	629185	80		671280	80
	629186	80		671281	80
	629187	80		671282	80
	629188	80		671283	80
	670151	80		715222	80
	670152	80		715223	80
	671262	80		715224	80
	671263	80		715225	80
	671264	80		715226	80
	671266	80		715227	80
	671267	80		715228	80
	671268	80		715229	80
	671269	80		715230	80
	671270	80		715231	80
	671271	80		715232	80
	671272	80		715233	80
	671273	80		715234	80
	671274	80		715235	80
	671275	80		715236	80
	671276	80		751057	80
	671277	80		751066	80
	671278	80			

**Expenditures (excludes power stripping)**

Type of Work Performed: **KENORA MINING DIV.**

Performed on Claim: **RECEIVED**  
**JAN 22 1985**  
**3 20 am**

Calculation of Expenditures: **789101121123458**

Total Expenditures: **\$** ÷ **15** =

**629151**

Total number of mining claims covered by this report of work.

**45**

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.

**For Office Use Only**

Total Days Cr. Recorded: **3600** Date Recorded: **January 22/85**

Mining Record: **ME Lemay Acting**

Date of this report recorded: **85-04-09** Inspector: **[Signature]**

Date: **Jan 17, 1985** Recorder/Holder or Agent Signature: **John E. Londry**

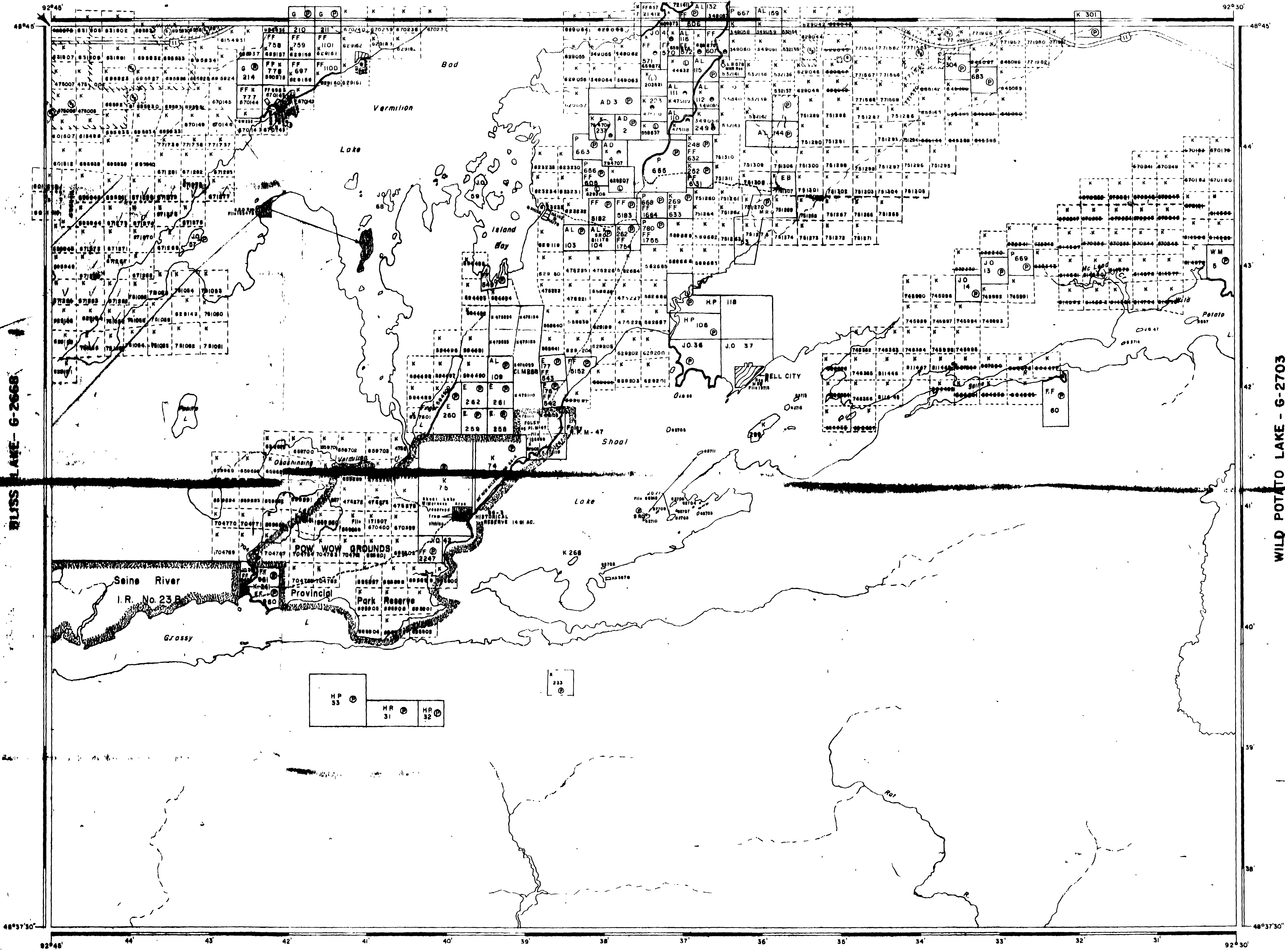
**Certification Verifying Report of Work**

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: **JOHN E. LONDROY, P.ENG.**  
**77 HOWARD ST., PH3,**  
**TORONTO, ONT., M4X 1J9.**

Date Certified: **Jan 17, 1985** Certified by (Signature): **John E. Londroy**

LITTLE TURTLE LAKE - G-2682



LEGEND

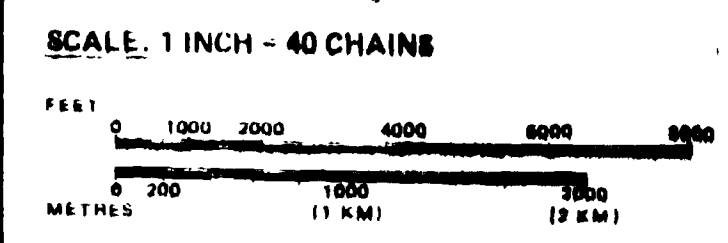
- PATENTED LAND
- CROWN LAND SALE
- LEASES
- LOCATED LAND
- LICENSE OF OCCUPATION
- MINING RIGHTS ONLY
- SURFACE RIGHTS ONLY
- ROADS
- IMPROVED ROADS
- KING'S HIGHWAYS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKED
- MINES
- CANCELLED
- PATENTED S.R.O.

REFERENCES

- AREAS WITHDRAWN FROM DISPOSITION
- M.R.O. - MINING RIGHTS ONLY
  - S.R.O. - SURFACE RIGHTS ONLY
  - M.S. - MINING AND SURFACE RIGHTS
- | Description | Order No. | Date | Disposition | File |
|-------------|-----------|------|-------------|------|
|             |           |      |             |      |

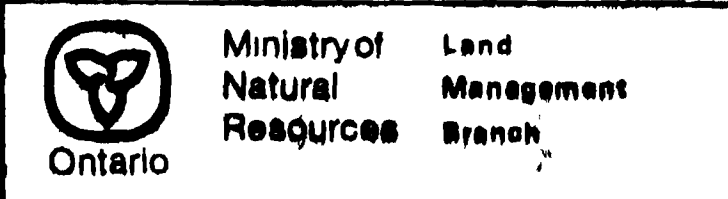
Scale & Gravel

- ⊙ M.T.C. Pit No 1818
- ⊙ " " " 1818
- ⊙ " " " 1814
- ⊙ M.T.C. Gravel Pit 1018
- ⊙ Gravel Pit 17073
- ⊙ " " " 8788
- ⊙ " " " 17078
- ⊙ Gravel Pit No 888
- ⊙ M.R. Gravel Reserve No 228
- ⊙ QUARRY PERMIT



**AREA BAD VERMILION LAKE**

M.N.R. ADMINISTRATIVE DISTRICT  
**FORT FRANCES**  
 MINING DIVISION  
**KENORA**  
 LAND TITLES / REGISTRY DIVISION  
**RAINY RIVER**



Date: MARCH, 1984

Number: **G-2665**

MELIN LAKE - G-2689

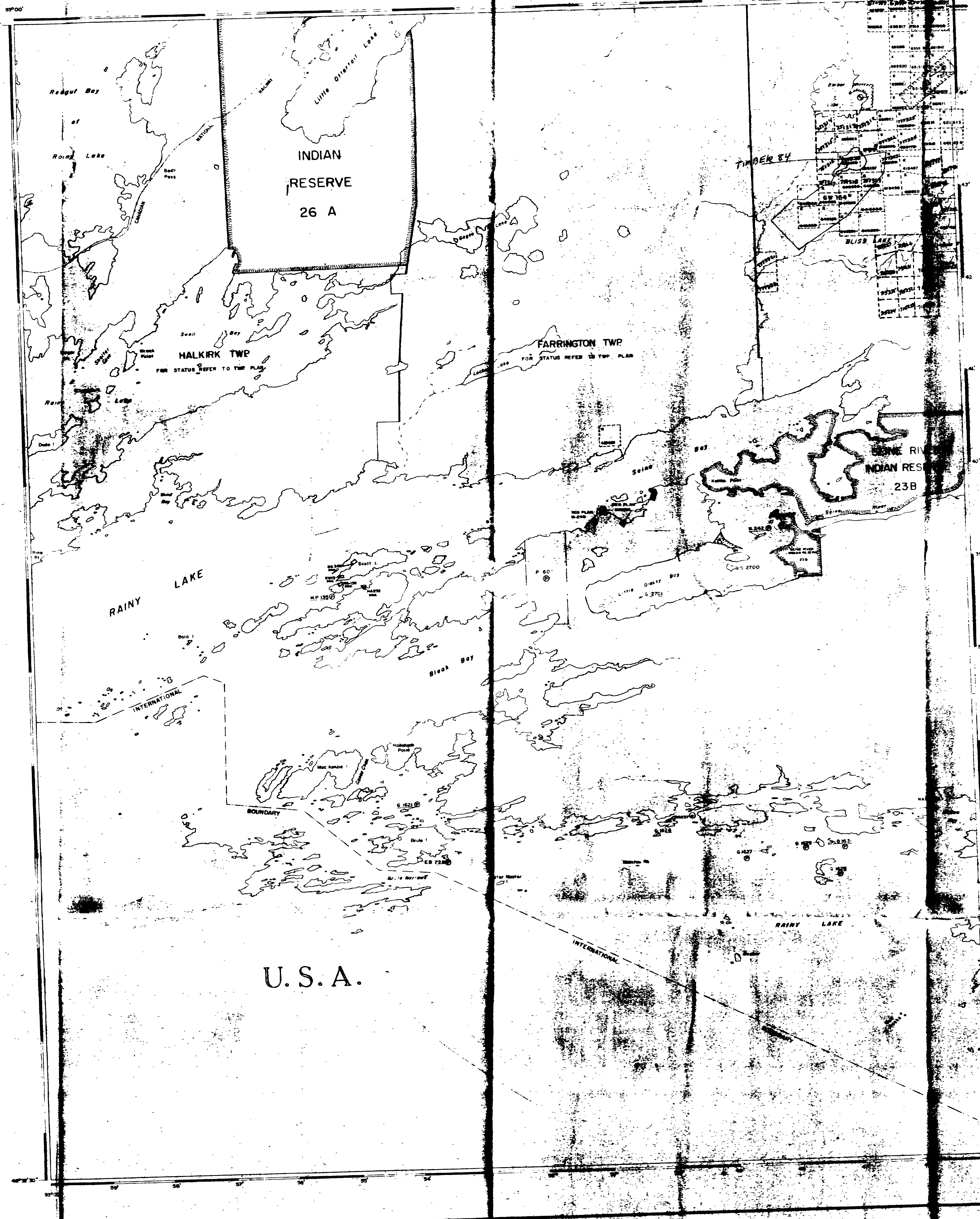
G-5662

2200



8092-9

PORTER INLET AREA G-2693



LEGEND

PATENTED LAND	CS
CROWN LAND SALE	CS
LEASES	LS
LOCATED LAND	LQ
LICENSE OF OCCUPATION	MRO
MINING RIGHTS ONLY	SRO
SURFACE RIGHTS ONLY	SRO
ROADS	
IMPROVED ROADS	
KINGS HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKES	
MINES	

REFERENCES

AREAS WITHDRAWN FROM DEPOSITION

M.R.O. - MINING RIGHTS ONLY
S.R.O. - SURFACE RIGHTS ONLY
M.L.E. - MINING AND SURFACE RIGHTS

ORDER NO. DATE DEPOSITED FILE NO.

1000 1000 1000 1000

SAND & GRAVEL

- 1000 1000 1000 1000
- 1000 1000 1000 1000
- 1000 1000 1000 1000

BAD VERMILION LAKE G-2665

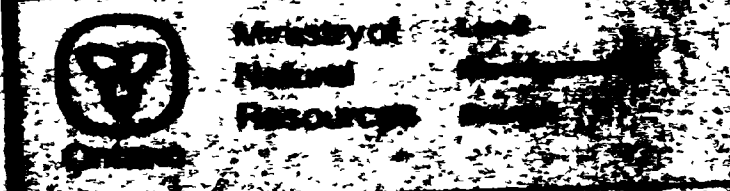
MELIN LAKE G-2689

RECEIVED MAY 31 1988

SCALE 1 INCH = 40 CHAINS

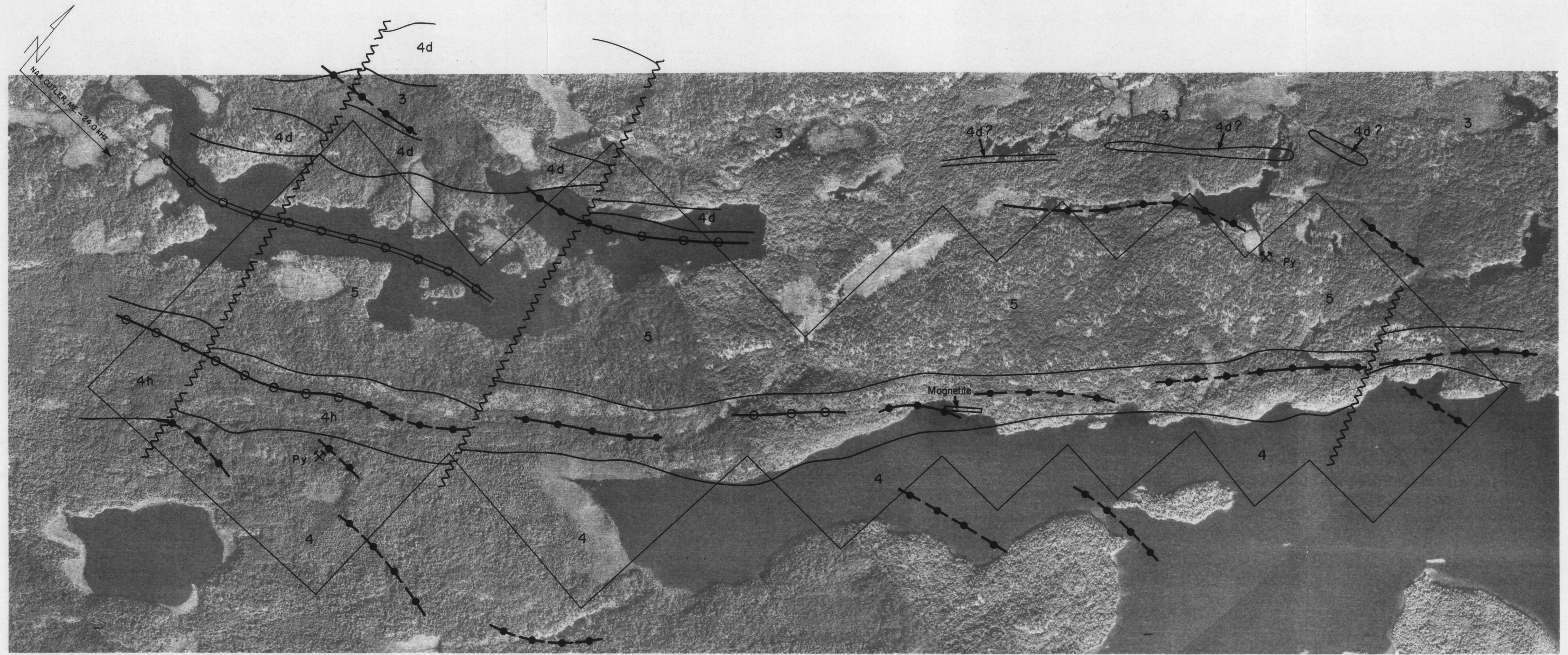
AREA BLISS LAKE (RAINY LAKE)

MIN. & ADMINISTRATION DEPARTMENT  
FORT FRANCOIS  
MINING DIVISION  
KENORA  
LAND TITLES / REGISTRY DIVISION  
RAINY RIVER



4-1367 G-2668

48° 44' N  
 ×  
 92° 45' W



GEOPHYSICAL INTERPRETATION LEGEND

	CONTACT	<b>5</b>	TRONDHJEMITE, GRANODIORITE
	FAULT	<b>4</b>	MAFIC INTRUSIVE
	(NAA) VLF CONDUCTOR AXES	<b>4d</b>	GABBRO
	MAJOR	<b>4h</b>	FE <sub>3</sub> O <sub>4</sub> RICH GABBRO
	DEFINITE	<b>3</b>	FELSIC VOLCANICS
	MINOR		
	INDICATES QUADRATURE RESPONSE		



TITAN TITANIUM INTERNATIONAL INC.

INTERPRETATION

BAD VERMILLION-BLISS LAKE GROUP  
 KENORA MINING DIVISION, ONTARIO

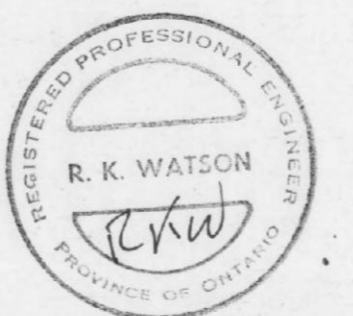
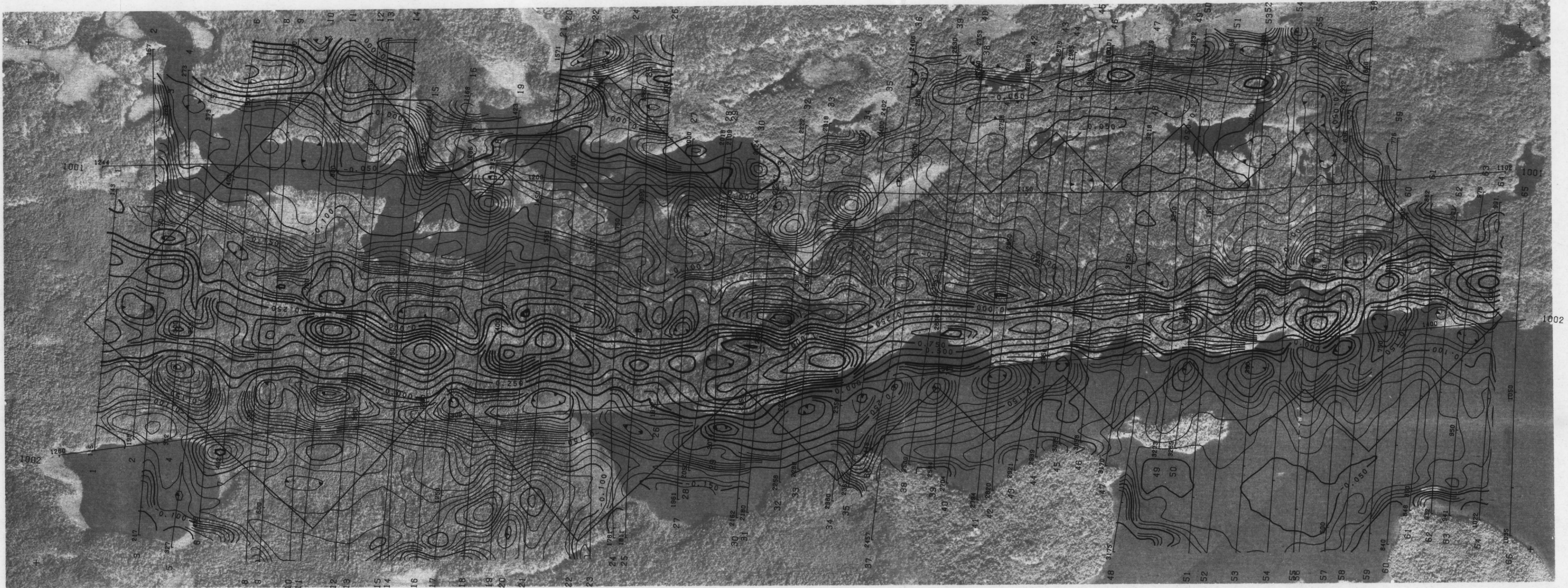
N.T.S. NO:	52 C/10	DRAWING NO.	B 421-4
SCALE	1 : 10,000	DATE:	FEB 1985

TERRAQUEST  
 TORONTO, CANADA





48° 44' N  
92° 45' W



LEGEND  
 TERRAIN CLEARANCE ..... 100 meters  
 LINE SPACING ..... 100 meters

1.0 gammas / meter    |||  
 .25 gammas / meter    |||  
 .05 gammas / meter    |||  
 .01 gammas / meter    |||

Claim Boundary    /

TITAN TITANIUM INTERNATIONAL INC.

AIRBORNE MAGNETIC SURVEY  
VERTICAL MAGNETIC GRADIENT  
Calculated From Total Field

BAD VERMILLION-BLISS LAKE GROUP  
KENORA MINING DIVISION, ONTARIO

N.T.S. NO: 52 C/10      DRAWING NO. B 421-2

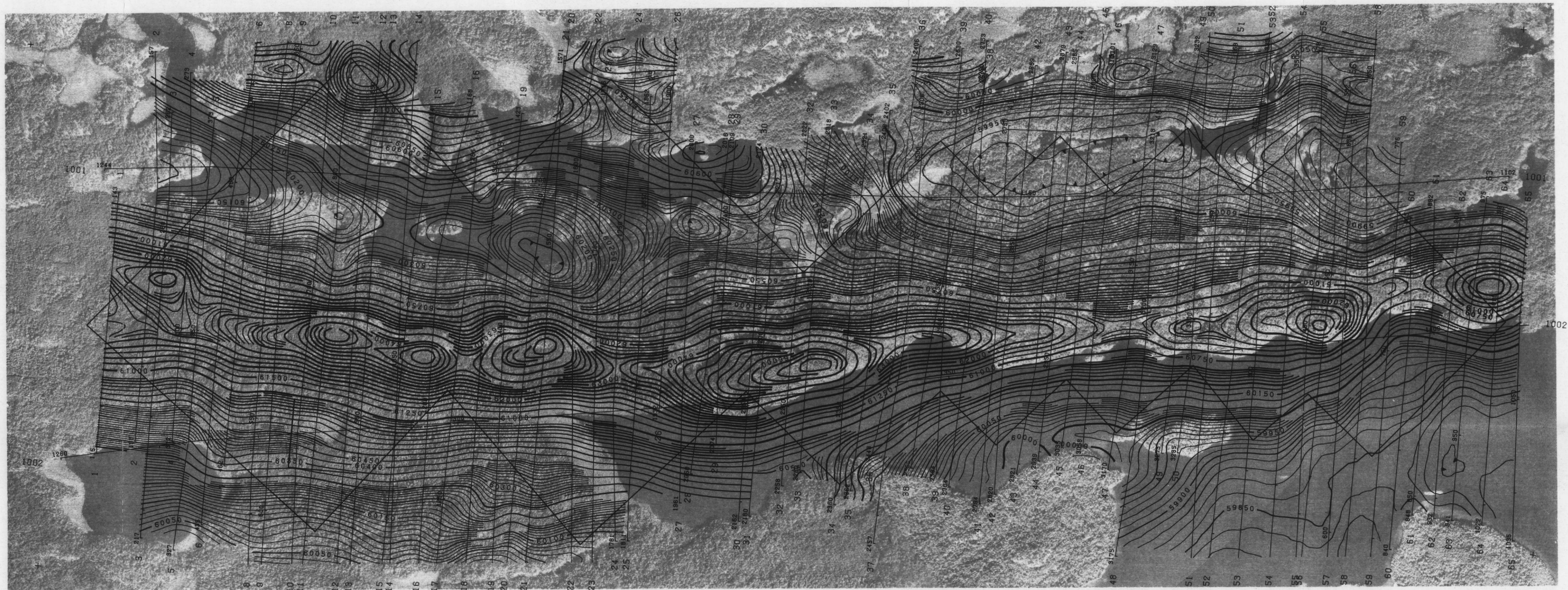
SCALE 1: 10,000      DATE: FEB 1985

TERRAQUEST  
TORONTO, CANADA





x  
48° 44' N  
92° 45' W



LEGEND  
 TERRAIN CLEARANCE ..... 100 meters  
 LINE SPACING ..... 100 meters  
 1000 gammas   
 250 gammas   
 50 gammas   
 10 gammas   
 Claim Boundary

TITAN TITANIUM INTERNATIONAL INC.

AIRBORNE MAGNETIC SURVEY  
TOTAL MAGNETIC FIELD

BAD VERMILLION-BLISS LAKE GROUP  
KENORA MINING DIVISION, ONTARIO

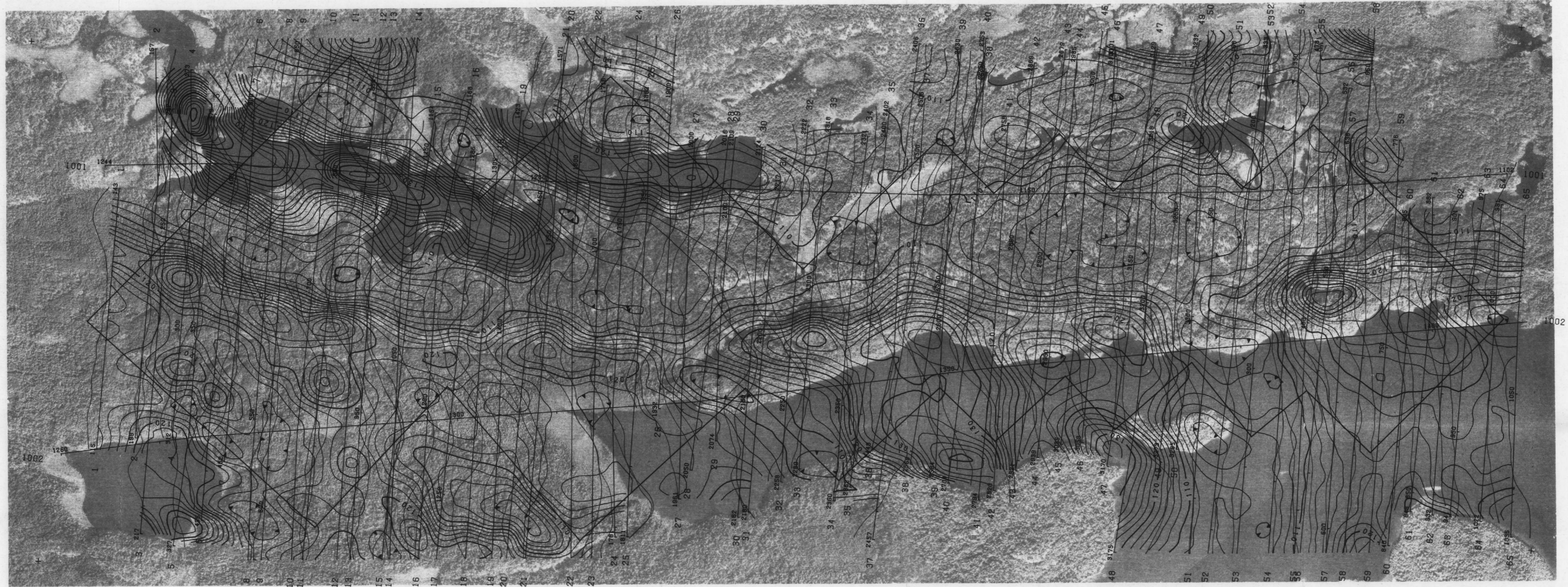
N.T.S. NO: 52 C/10      DRAWING NO B 421-1

SCALE 1 : 10,000      DATE: FEB 1985

TERRAQUEST  
TORONTO, CANADA



X  
48° 44' N  
92° 45' W



LEGEND  
 TERRAIN CLEARANCE ..... 100 meters  
 LINE SPACING ..... 100 meters  
 FIELD STRENGTH  
 50 % [thick line]  
 10 % [medium line]  
 2 % [thin line]  
 Claim Boundary [dashed line]  
 QUADRATURE  
 +10% [upward curve]  
 -10% [downward curve]

TITAN TITANIUM INTERNATIONAL INC.  
 AIRBORNE VLF-EM SURVEY  
 CONTOURS OF TOTAL FIELD STRENGTH  
 PROFILES OF QUADRATURE  
 BAD VERMILLION-BLISS LAKE GROUP  
 KENORA MINING DIVISION, ONTARIO  
 N.T.S. NO: 52 C/10      DRAWING NO. B 421-3  
 SCALE 1 : 10,000      DATE: FEB 1985  
 TERRAQUEST  
 TORONTO, CANADA