



42A10SE0050 2.13891 STOCK

010

GEOPHYSICAL REPORT
FOR
NAHANNI MINES LIMITED
ON THE
SOUTH PIPESTONE PROPERTY
STOCK TOWNSHIP
PORCUPINE MINING DIVISION
TIMMINS, ONTARIO

RECEIVED

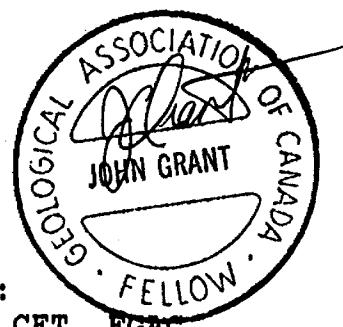
FEB 05 1991

MINING LANDS SECTION

12-2891

2.13891

Prepared By:
J.C. Grant, CET, FGAC
Exsics Exploration Ltd.
January, 1991



QUAL
2.5347



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INTRODUCTION

During December 1990 a total of 10.1 miles of grid was established on the 8 claim property. A total field magnetic and two VLF Surveys were completed on the unpatented contiguous claim group known as the South Pipestone Property in Stock Township in the Porcupine Mining Division, Province of Ontario.

A total of 1088 magnetic and 2176 EM readings were recorded during the survey period from December 27, 1990 to January 2, 1991. The linecutting, magnetic survey and electromagnetic survey were completed by personnel of Exsics Exploration Limited. The interpretation and report were completed by the author from January 3, 1991 to January 29, 1991.

The project area is located in the northeast corner of Stock Township approximately 35 miles northeast of the City of Timmins.

The purpose of the survey was to identify the lithological units, structural features and geophysical anomalies favourable for gold deposition.

PERSONNEL

The people directly involved with the field work and the collection of all data are as follows:

Robin Mathieu.....Timmins, Ontario

Paul Edwards.....Timmins, Ontario

Ed Brunet.....Timmins, Ontario

The work was carried out under the supervision of J. C. Grant.

LOCATION AND ACCESS

The 8 contiguous unpatented mining claims are located in the northeast corner of Stock Township, Porcupine Mining Division, Province of Ontario as shown in Figure 1.

The project area is immediately south of the Montclerg Gold deposit and is approximately 6 miles due east of the Clavos Gold deposit.

Access to the property is via provincial Highway 101 East from Timmins and then north on Highway 577. The eastern property line is coincident with the latter highway.

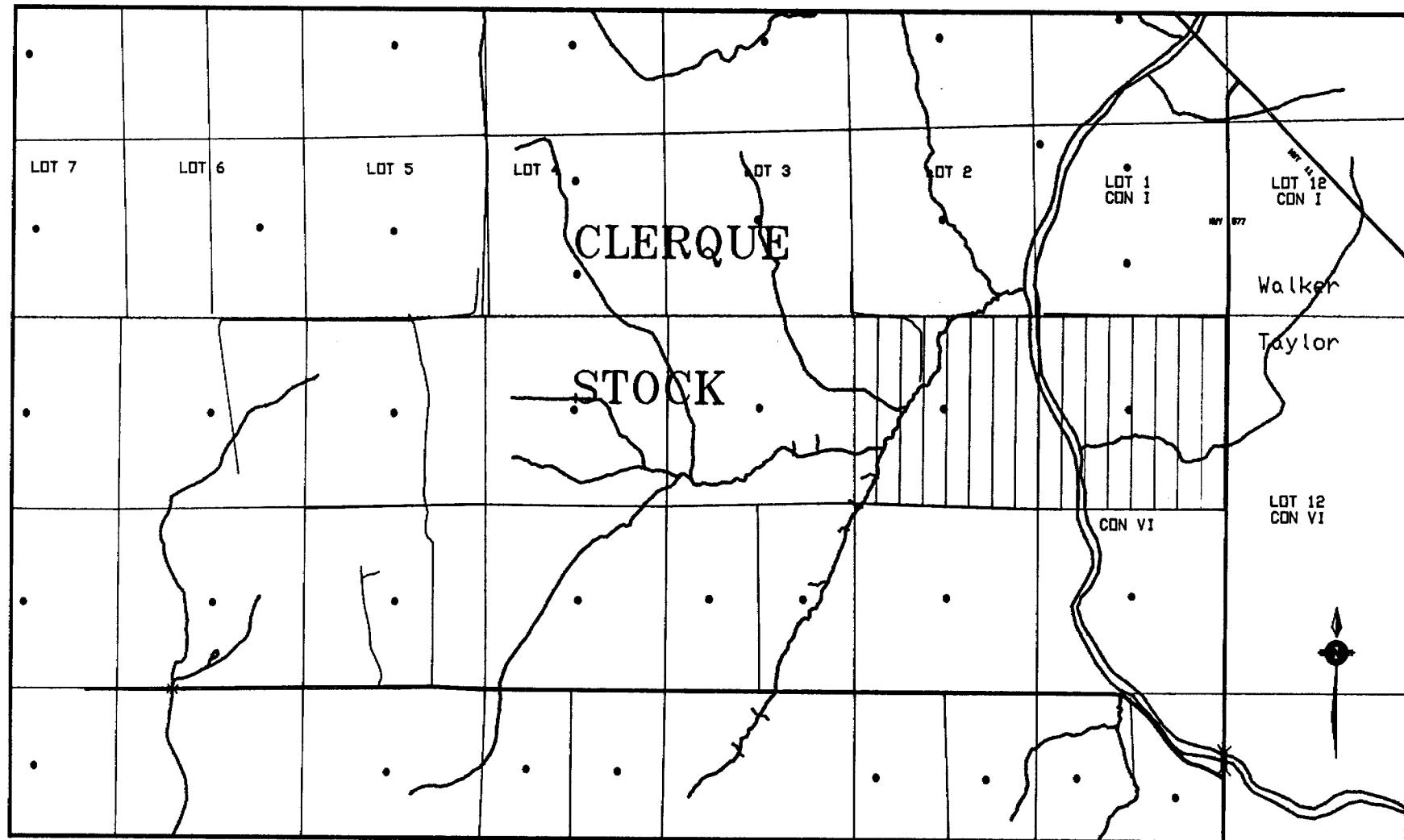


FIGURE 1: LOCATION MAP

0 400 800 1200m

The property is covered with a thick, 100 to 150 foot sequence of glacial gravel, sand and clay. The topography is flat with some 30 to 50 foot banks along river and stream channels.

CLAIM GROUP

The South Pipestone Property consists of 8 contiguous unpatented mining claims as shown in Figure 2 and includes the following claim numbers:

P-1154349 - P-1154352 N1/2 Lot 1 Con VI Stock Twp

P-1154353 - P-1154356 N1/2 Lot 1 Con VI Stock Twp

The property is owned 100% by Nahanni Mines Limited, Toronto, Ontario.

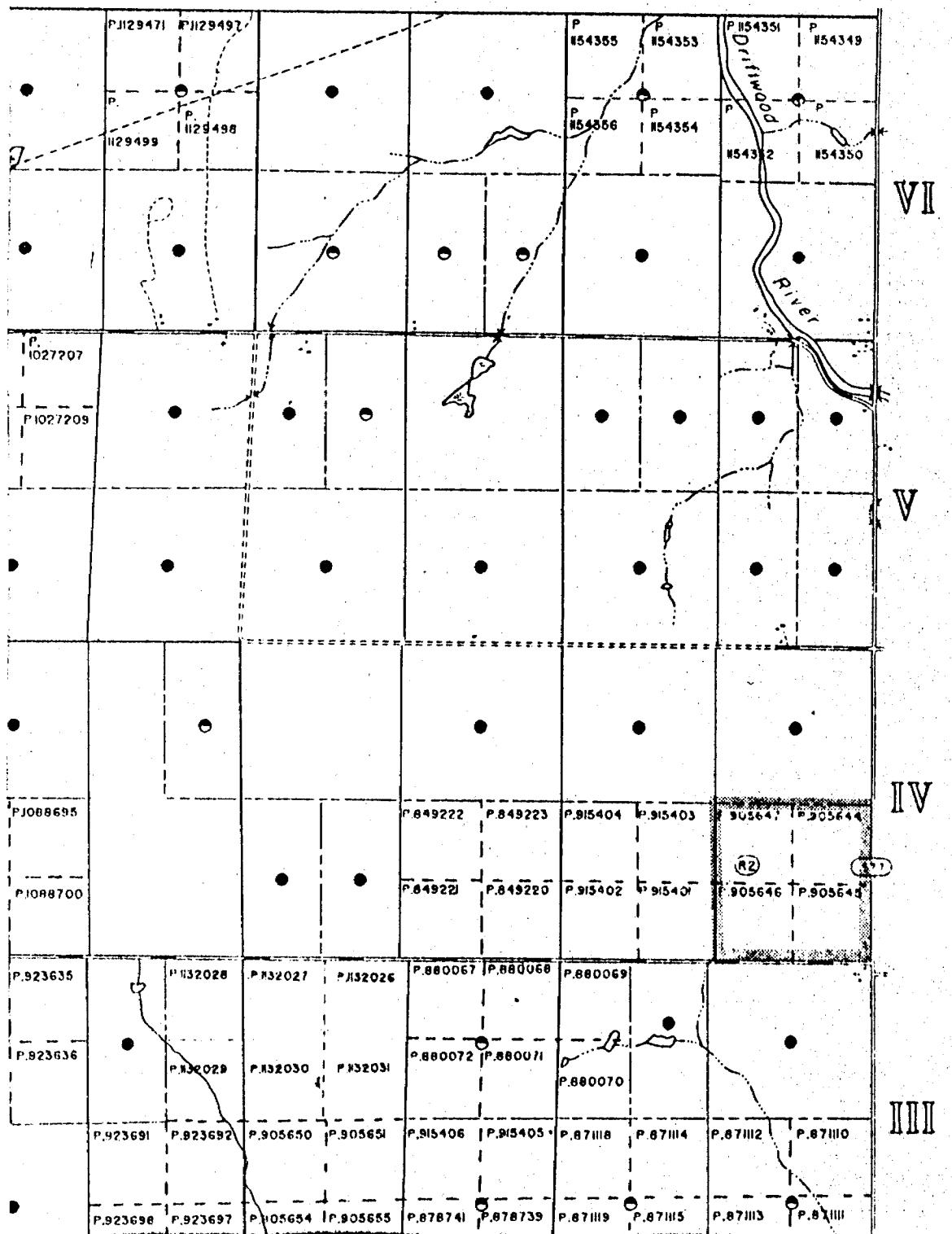


FIGURE 2: CLAIM MAP

GENERAL GEOLOGY

The project area is located in the Precambrian Shield. The rocks are a sequence of meta-sedimentary units consisting of argillites and greywackes intruded by a series of felsic sills. These units are in turn cross cut by a series of north-northwest trending diabase dikes. Structurally the property adjoins the major east trending Pipestone Fault which is host to several gold deposits in the area and contains at least one fault splay known to be gold bearing.

PREVIOUS EXPLORATION ACTIVITIES

Research has revealed that the property has been the subject of limited exploration efforts in the past. This activity consisted of numerous magnetic and electromagnetic surveys and limited diamond drilling which was completed for assessment requirements.

GEOPHYSICAL PROGRAM

During the period from December 10th to December 19th, 1990, a total of 10.1 miles of grid were established. A total field magnetic & gradient survey and two VLF-EM surveys were performed.

The baseline and tie-line were established with an east-west strike and the grid lines with a spacing of 100 meters were established at right angles. All lines were picketed at a 25 meter interval. Station 0+00 on the baseline is located at the northeast corner of claim P-1154349 at the intersection of Stock, Taylor, Walker and Clerque Townships.

A total of 1088 magnetic readings and 2176 VLF-EM readings were recorded during the survey period from December 27, 1990 to January 2, 1991.

Magnetic and Gradient Survey:

The magnetic gradient survey was completed using the EDA Omni IV system with readings taken at 12.5 m intervals. Specifications for this unit can be found as Appendix A of this report.

The unit is capable of recording and storing magnetic values accurate to the decimal point, thus greatly improving the accuracy as well as the quality of the collected data.

A base station was set up on the grid at a fixed point and tuned to a reference field of 58586 gammas. The field units were also tuned to the same reference field at the same point. The base station was set to record and store values at 30 second intervals throughout the day so as to monitor any spiking or changes in the earth's diurnal.

At the end of each survey day the field units and base station units are coupled together and raw field data is dumped to the base station where it is merged and corrected. The resulting dumped data from the two units is the corrected data ready for plotting.

For ease in plotting, all of the data has had a background of 58000 gammas removed from it. The data was then plotted on base maps at a scale of 1:2000 and then contoured at 10 gamma intervals wherever possible. See Figure 3 of this report.

Electromagnetic (VLF) Surveys:

This survey was completed using the EDA Omni Plus System. Specifications for this unit can be found as Appendix B of this report. The survey was run using a frequency of 24.0 kHz transmitting from Cutler, Maine and 21.4 kHz transmitting from Annapolis Maryland. This would give the best coupling with any suspected north-south striking structure.

One dip angle measurement and one field strength value were recorded at each station.

The dip angle values were then plotted on a base map at a scale of 1:2000. A true crossover or conductor axis would be positive to negative values when traversing south to north.

Also a low pass filtering called Fraser Filtering was done with the VLF Dip Angle measurements. This filtering results in positioning high positive values over shallow buried sources and less positive values over deeper sources. It also helps in areas of inflections when there is not a real crossover point.

One should keep in mind when interpreting VLF data, that the responses can relate to all sorts of geological noise such as, faults, dikes, outcrop to swamp contacts, creeks, ponds and of course electrically charged units.

Data for the VLF and Fraser Filter profiles are shown as Figures 4, 5, 6, & 7 of this report.

SURVEY RESULTS

The most obvious magnetic trends are the four north-northwest trending features believed to be diabase dikes which were confirmed by earlier diamond drilling. These dikes are offset, left-laterally by a series of east-northeast trending faults (F1 Series). A second fault, F2, crosses the centre of the property and offsets left-laterally the dikes and the F1 series of cross faults. See Figure 3.

The Cutler Maine VLF-EM data indicates the presence of 8 conductive zones which are labelled C1 to C8 as shown in Figures 4 & 5. The Annapolis, Maryland VLF-EM data indicates the presence of two conductive trends which are labelled A1 and A2 as shown in Figures 6 & 7.

Zone C1, may be due to slightly mineralized sediments as previous drilling intersected a sequence of pyritic sediments intruded by a series of narrow felsic and mafic dikes.

Zone C2, is parallel to a weak magnetic trend, sub-parallel to F2, that occurs in the northwest corner of the property. This zone is well defined for approximately 600 feet.

Zone C3, is a one line anomaly located approximately 350 feet south of C2 and is possibly due to sulphide mineralization.

Zone C4, located on the east side of the river is probably caused by either a geological contact or sulphide mineralization.

Zone C5, coincident with A1, is probable due to the north easterly trending fault.

Zone C6 & C7, appear to be parallel to sub-parallel conductors which may outline both contacts of a lithological unit.

Zone C8, is a short, one line anomaly, located near the south end of Line 7W and is probably due to the edge effects of a dike.

Finally, Zone A2 appears to be related to a magnetic low and is parallel to one of the regional faults (F2). The zone may be due to sulphide mineralization associated with this structure.

RECOMMENDATIONS AND CONCLUSIONS

The geophysical surveys covered by this report were successful in locating structural features and lithological units and several electromagnetic anomalies.

The surveys outlined two easterly trending magnetic features, one defined by Fault F2 and a second, located in the northwest quadrant of the property. Both of these features are defined by magnetic lows. Fault F2, partially defined by Conductor A2 is parallel to the Pipestone Fault which lies immediately adjacent to the northwest corner of the property. The northern magnetic feature which is coincident with Conductor C2 is believed to be a fault splay from the Pipestone Fault which is known to be auriferous.

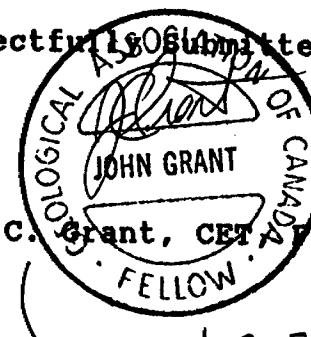
Based upon the results of the present survey further data filtering to better define the structure of the property should be considered. Computerization has provided enhancement techniques which enable detailed interpretations of complex areas similar to those shown on the survey maps i.e. interference of north trending features dominant magnetic signatures of east

trending lithologies. Recommendations are made to complete vertical gradient and trending analysis calculations. These recommendations would include establishing detailed grid lines in selected areas (e.g. northern magnetic trend).

Recommendations are made to conduct diamond drilling on the coincident magnetic and EM anomalies in the northwestern quadrant, Conductor C2 and Feature F2.

Respectfully submitted,

John C. Grant, CET, FGAC



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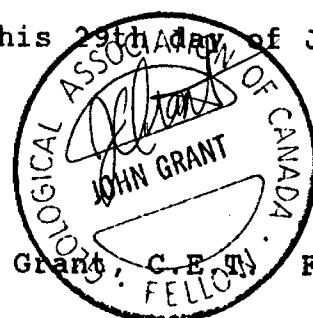
CERTIFICATE OF QUALIFICATIONS

I, John Charles Grant do hereby certify:

1. that I am a geophysicist and reside at Lot 2
Martineau Avenue, Kamiskotia Lake, Timmins,
Ontario.
2. that I am a Fellow of the Geological Association
of Canada.
3. that I am a member of the Certified Engineering
Technologist Association.
4. that I graduated from Cambrian College of Applied
Arts and Technology, Sudbury Campus in 1975 with
an Honour's diploma in Geology Technology.
5. that I have practised my profession continuously
for 13 years.
6. that my report on the SOUTH PIPESTONE PROPERTY,
for NAHANNI MINES LIMITED, is based on work
carried out under my supervision.
4. I hold no specific or special interest in the
described property. I have been retained as a
Consulting Geophysicist for "the property".

Dated this 29th day of January, 1991 at Timmins, Ontario

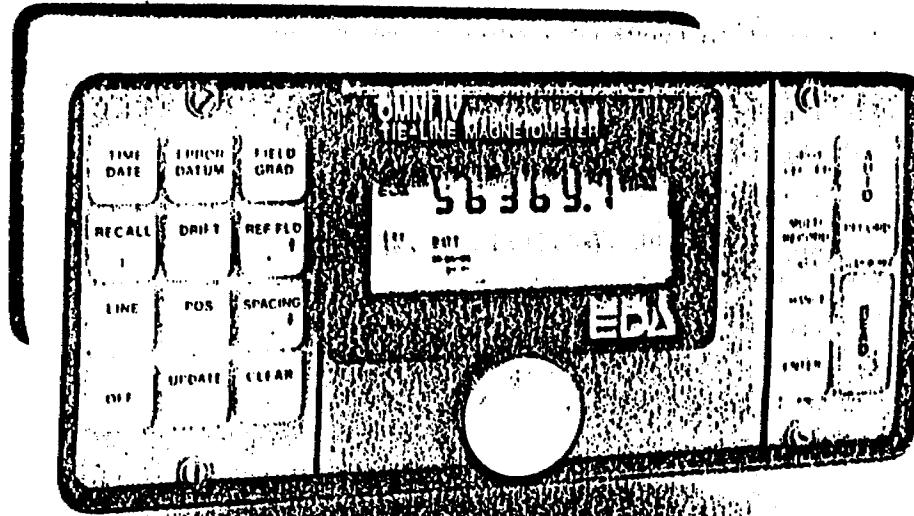
John C. Grant, C.E.T., F.G.A.C.



A P P E N D I X A

OMNI IV "Pie-line" Magnetometer

EDA



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

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	1 %.
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.
Standard System Complement	Instrument console with carrying strap, batteries and operations manual.
Available Options	Stainless steel transmitting electrodes, copper sulphate receiving electrodes, alligator clips, bridge leads, wire spools, Interface cables, rechargeable batteries, charger and software programs.

EDA Instruments Inc.
4 Thorncliffe Park Drive,
Toronto, Ontario
Canada M4H 1H1
Telex: 06 25222 EDA TOR
Cable: Instruments Toronto
416/425 7800

In U.S.A.
EDA Instruments Inc.
5151 Ward Road,
Wheat Ridge, Colorado
U.S.A. 80033
(303) 422 9112

A P P E N D I X B

OMNI PLUS VLF / Magnetometer System

EDA



Major Benefits of the OMNI PLUS

- Combined VLF/Magnetometer/Gradiometer System
- No Orientation Required
- Three VLF Magnetic Parameters Recorded
- Automatic Calculation of Fraser Filter
- Calculation of Ellipticity
- Automatic Correction of Primary Field Variations
- Measurement of VLF Electric Field



Specifications*

Frequency Tuning Range	15 to 30 kHz, with bandwidth of 150 Hz; tuning range accommodates new Puerto Rico station at 28.5 kHz
Transmitting Stations Measured . .	Up to 3 stations can be automatically measured at any given grid location within frequency tuning range
Recorded VLF Magnetic Parameters	Total field strength, total dip, vertical quadrature (or alternately, horizontal amplitude)
Standard Memory Capacity	800 combined VLF magnetic and VLF electric measurements as well as gradiometer and magnetometer readings
Display	Custom designed, ruggedized liquid crystal display with built-in heater and an operating temperature range from -40°C to +55°C. The display contains six numeric digits, decimal point, battery status monitor, signal strength status monitor and function descriptors.
RS232C Serial I/O Interface	2400 baud rate, 8 data bits, 2 stop bits, no parity
Test Mode	A. Diagnostic Testing (data and programmable memory) B. Self Test (hardware)
Sensor Head	Contains 3 orthogonally mounted coils with automatic tilt compensation
Operating Environmental Range	-40°C to +55°C; 0 - 100% relative humidity; Weatherproof
Power Supply	Non-magnetic rechargeable sealed lead-acid 18V DC battery cartridge or belt; 18V DC disposable battery belt; 12V DC external power source for base station operation only.
Weights and Dimensions	
Instrument Console	2.8 kg, 128 x 150 x 250 mm
Sensor Head	2.1 kg, 130 dia. x 130 mm
VLF Electronics Module	1.1 kg, 40 x 150 x 250 mm
Lead Acid Battery Cartridge	1.8 kg, 235 x 105 x 90 mm
Lead Acid Battery Belt	1.8 kg, 540 x 100 x 40 mm
Disposable Battery Belt	1.2 kg, 540 x 100 x 40 mm

*Preliminary

EDA Instruments Inc.,
4 Thorncliffe Park Drive,
Toronto, Ontario
Canada M4H 1H1
Telex: 66 23222 EDA TOR,
Cables: Instruments Toronto
(416) 425-7800

In USA,
EDA Instruments Inc.,
5151 Ward Road,
Wheat Ridge, Colorado
U.S.A. 80033
(303) 422-9112

Printed In Canada

A P P E N D I X C



Ministry of
Northern Development
and Mines

**Geophysical-Geological-Geochemical
Technical Data Statement**

File _____

**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) TOTAL FIELD MAGNETIC & VLF

Township or Area STOCK TOWNSHIP

Claim Holder(s) NAHANNI MINES LIMITED

Survey Company EXSICS EXPLORATION LTD.

Author of Report John C. GRANT

Address of Author Box 1880, Timmins, Ont.

Covering Dates of Survey DEC 10/90 - JAN 30/91
(linecutting to office)

Total Miles of Line Cut 10.1 miles.

**SPECIAL PROVISIONS
CREDITS REQUESTED**

ENTER 40 days (includes
line cutting) for first
survey.

ENTER 20 days for each
additional survey using
same grid.

	DAYS per claim
Geophysical	<u>40</u>
-Electromagnetic	<u>40</u>
-Magnetometer	<u>40</u>
-Radiometric	
-Other	
Geological	
Geochemical	

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

Magnetometer Electromagnetic Radiometric
(enter days per claim)

DATE: Jan 31/91 SIGNATURE: John C. Grant
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

File No.	Type	Date	Claim Holder
.....
.....
.....
.....

MINING CLAIMS TRAVESED
List numerically

P 1154349
(prefix) (number)

1154350

1154351

1154352

1154353

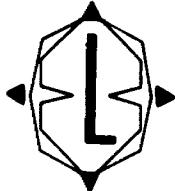
1154354

1154355

1154356

If space insufficient, attach list

TOTAL CLAIMS 8



EXSICS EXPLORATION LIMITED
CONTRACTING & CONSULTING GEOPHYSICS

Tel. (705) 267-4151

P.O. Box 1880
Timmins, Ontario P4N 7X1

April 10, 1991

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17/42

APR 12 1991

MINING LANDS SECTION

Mr. Larry Staliker
Ministry of Northern Development & Mines
4th Floor, 159 Cedar Street
SUDBURY, ONTARIO
P3E 6A5

Re: File # 2-13891

Dear Sir:

A further explanation of the VLF survey procedure which was done on the North and South Pipestone Properties.

We asked for and applied for 20 days per claim, per survey, because I had one operator read the grids using the Omni Plus set at 24.0 khz and one operator using a second Omni Plus set at 21.4 khz. This was done to speed up the survey and to provide more accurate data. We had noticed that usually the 21.4 khz frequency has become somewhat weaker during the day so we decided to put two men out so the 24.0 khz frequency would not be delayed.

I know this kind of defeats the purpose of the Omni Plus System, but at times it is necessary to obtain quicker results.

Thank You,

J. C. Grant
Exploration Manager

JCG:sl



B. J. MCKAY GEOLOGICAL CONSULTANT

P.O. Box 219
Porcupine, Ontario P0N 1C0

(705) 268-3050

MNDM

Mining Lands

4th Floor

159 Cedar St

Sudbury, Ontario

Dear Sir

RECEIVED

FEB 05 1991

HP
MINING LANDS SECTION

Enclosed are two copies of technical surveys to be filed for assessment credit for property in Stock Twp.

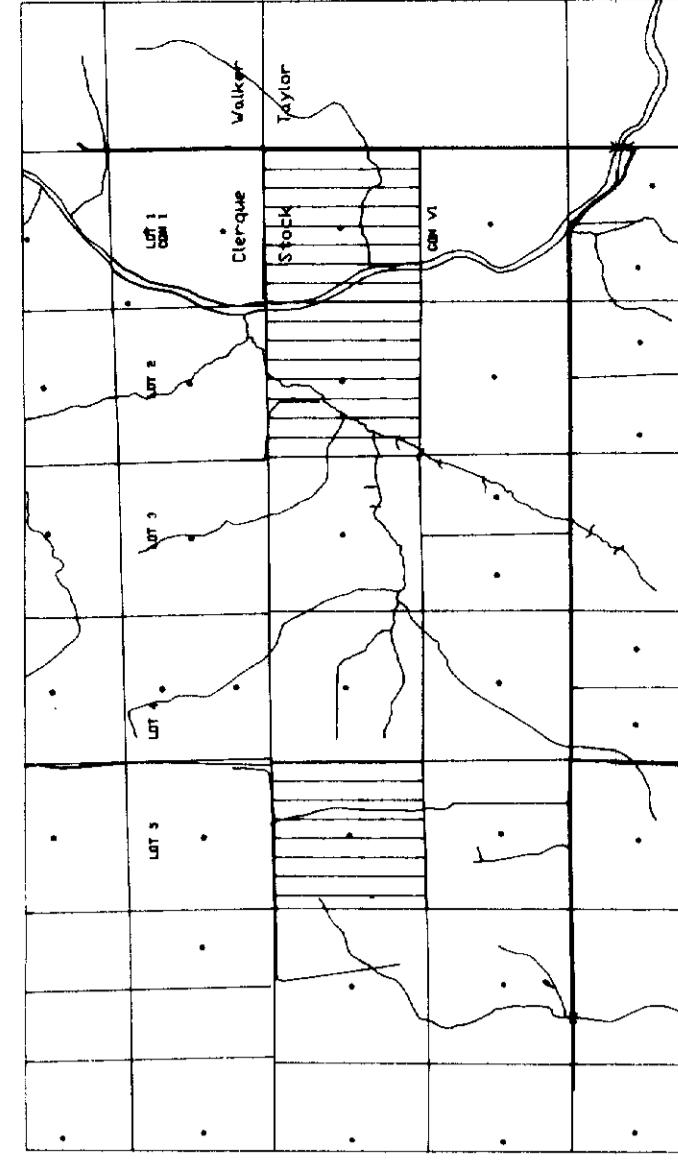
The Report of Work form has been filed in Timmins.

I hope everything is in order

Yours truly

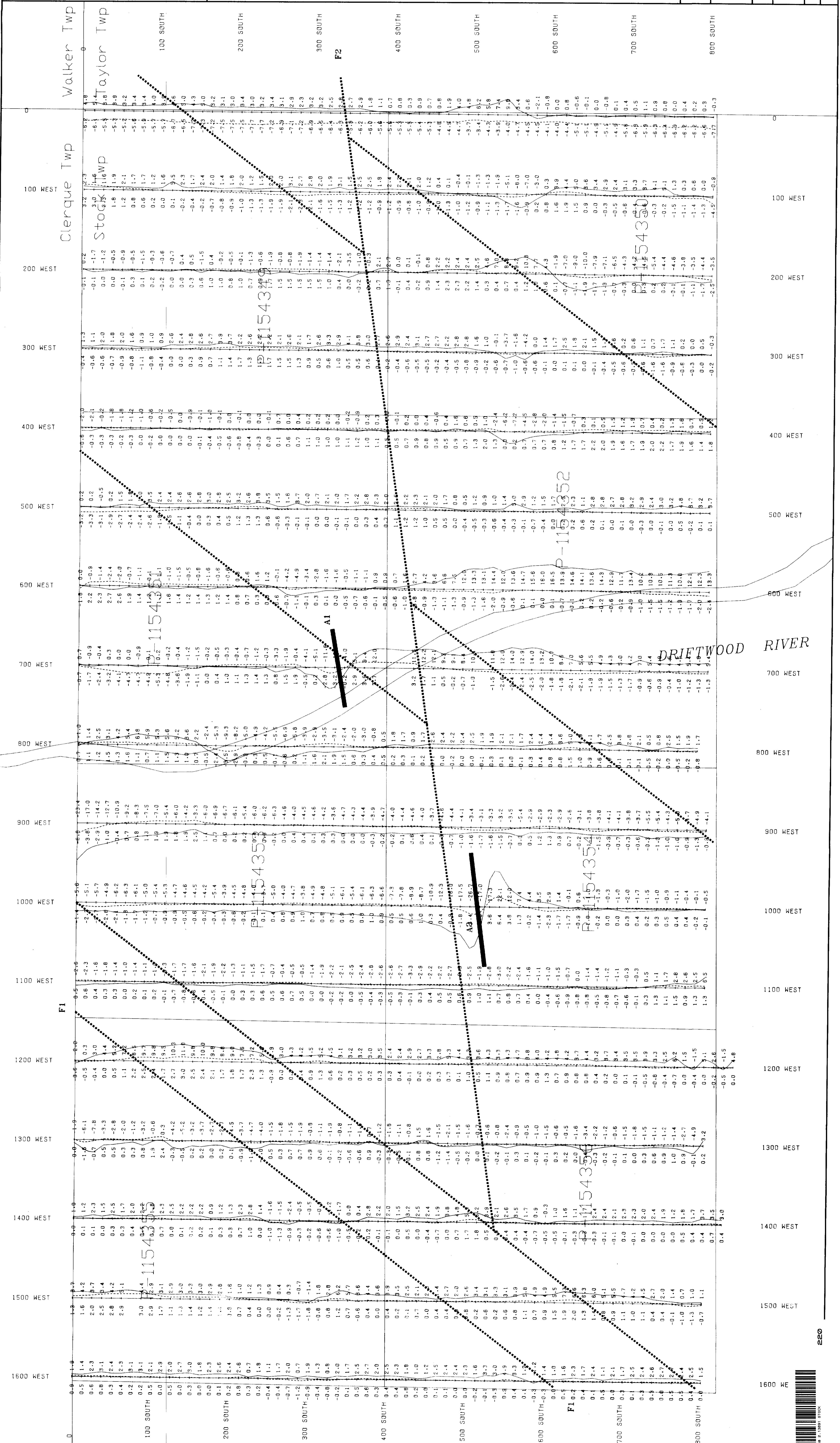
B. J. McKay

LOCATION MAP



LEGEND

A1 VLF-EM ANOMALY AXIS, ANNAPOLIS, MARYLAND
A2 VLF-EM ANOMALY AXIS, ANNAPOLIS, MARYLAND
FAULT ZONES BASED ON GEOPHYSICAL SURVEYS
CLAIM LINES
TOWNSHIP BOUNDARIES



STOCK TOWNSHIP, ONTARIO
ASSOCIATION OF
JOHN GRANT
CANADA
1500 WEST

SURVEY BY: Exacis Exploration Ltd. DATE: Dec. 1990
FILE NO.: B1-MACKY CONSULTANT

PRODUCT NO.: 42-13889-2-13891 STOCK

FILE NO.: B1-MACKY CONSULTANT

SCALE IN METERS
0 25 50 75 100 125 150

1:2000 (1cm = 200m)

200 WEST

300 WEST

400 WEST

500 WEST

600 WEST

700 WEST

800 WEST

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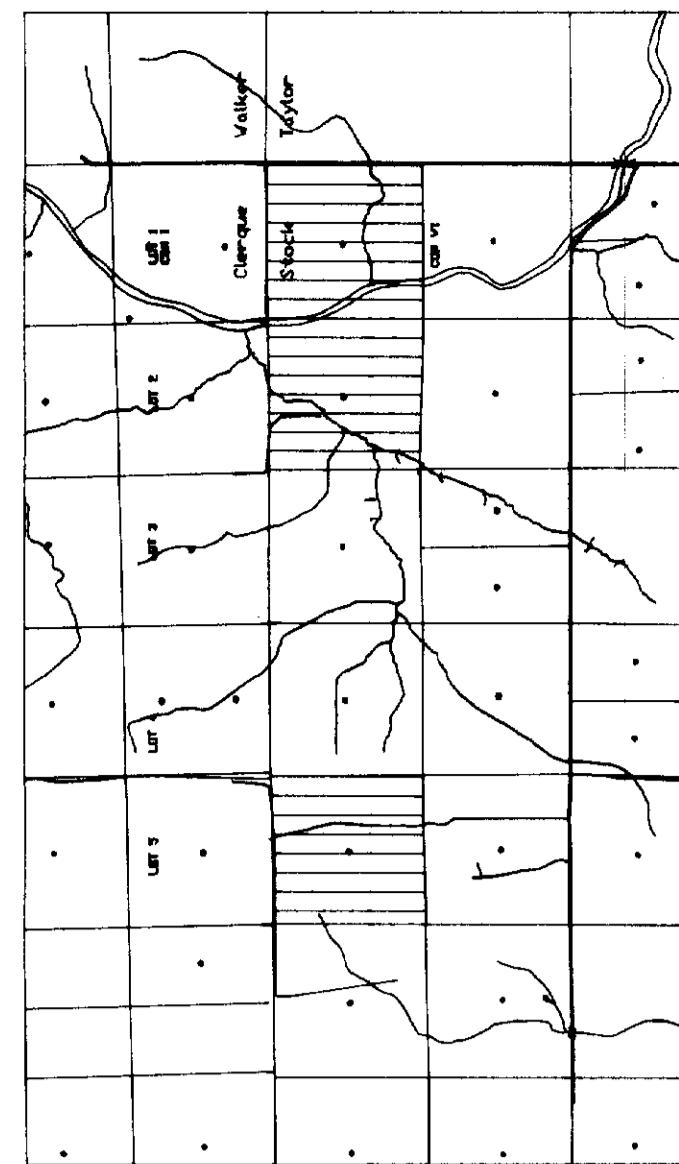
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46000 WEST

47000 WEST

48000 WEST

LOCATION MAP



LEGEND

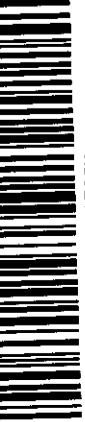
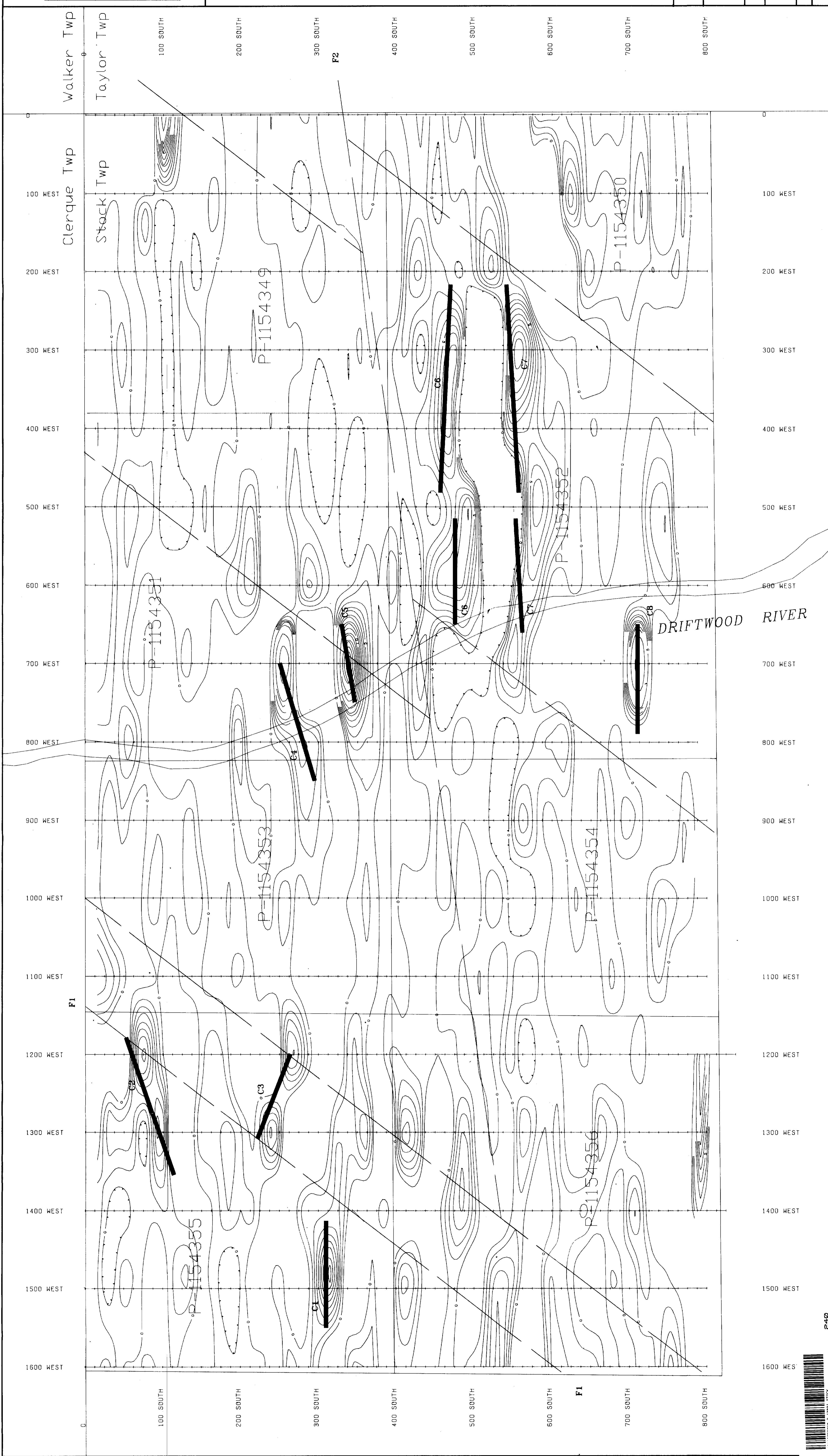
C5 VLF-EM ANOMALY AXIS, CUTLER, MAINE
FAULT ZONES BASED ON GEOPHYSICAL SURVEYS
CLAIM LINES

NAHANNI MINES LIMITED
2.1389

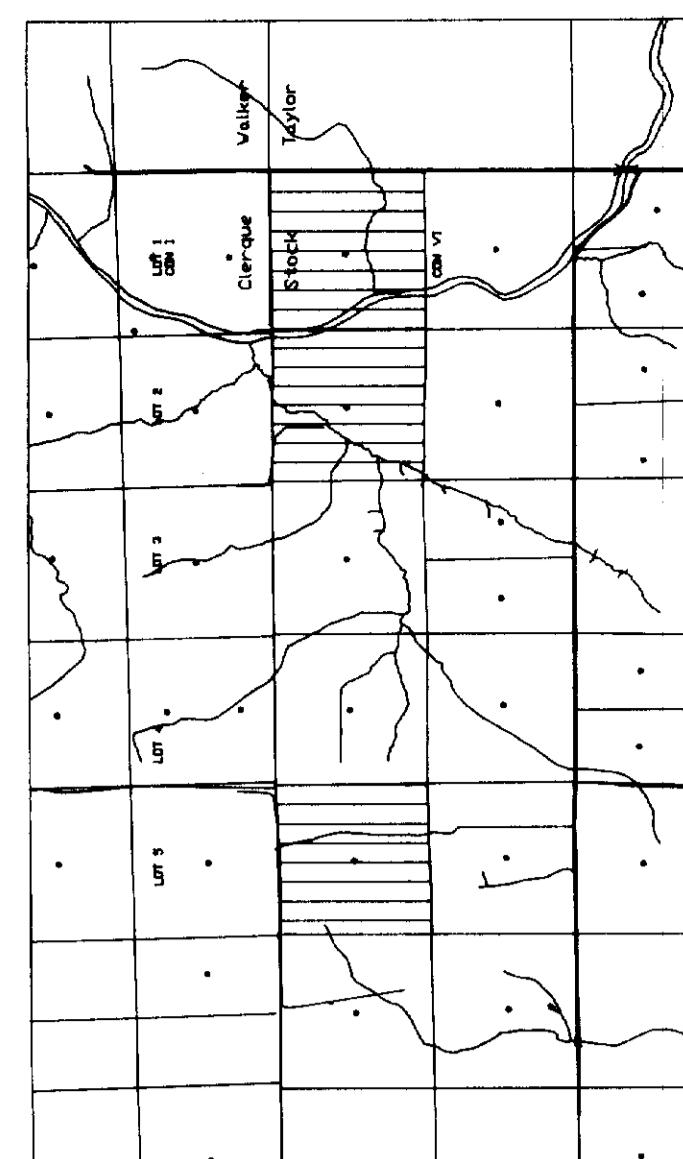
SOUTH PIPESTONE

**FRASER FILTER
CUTLER, MAINE**

PORCUPINE MINING DIVISION, ONTARIO			
 SCALE IN METERS 50 25 0 50 100 150 1:2000 (1cm = 20meters)		SURVEY BY: Erixies Exploration Ltd. REVISION BY: PROJECT NO.: FILE NO.:	DATE: Dec. 1990 DATE:  B.J. McKay Geological Consultant



LOCATION MAP



LEGEND

**A1 VLF-EM ANOMALY AXIS, ANNAPOLIS, MARYLAND
FAULT ZONES BASED ON GEOPHYSICAL SURVEYS
CLAIM LINES
TRUSTSHIP BOUNDARIES**



2.13891

NAHANNI MINES LIMITED

**SOUTH PIPESTONE
FRASER FILTER
ANNAPO利S, MARYLAND**

STOCK TOWNSHIP PORCUPINE MINING DIVISION, ONTARIO			
		SCALE IN METERS	
0	25	0	100
0	25	50	150
		1 : 2000 (1cm = 20meters)	
SURVEY BY: Exsics Exploration Ltd.		DATE: Dec. 1990	B.J. McKay Geological Consultant
DIVISION BY:			
PROJECT NO.: 100-100		NO.:	

NO.:  Geological Consultant

Bar code labels are printed on the back of each page. The labels consist of a vertical barcode followed by a series of horizontal bars.