



42A15NW0002 2.13767 HANNA

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REPORT ON  
GEOPHYSICAL WORK

ON

HANNA PROPERTY

HANNA TOWNSHIP

FOR

COMSTATE RESOURCES LTD.

NTS: 42-A/14

**2.13767**

DECEMBER 1990

*Qual.*  
*2.8510*  
S. TAYLOR  
TIMMINS GEOPHYSICS LTD.

## SUMMARY AND RECOMMENDATIONS

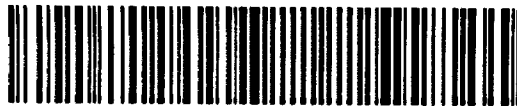
HLEM and magnetic surveys were carried out over 54 claims in Hanna Township.

The magnetic survey outlined a large ultramafic unit striking northwest to west northwest. A smaller linear high maps a second ultramafic unit. The remainder of the survey area, underlain by andesitic to mafic volcanics, has low magnetic relief. Twenty-one HLEM anomalies were located, nearly all of which lie within areas of low magnetic relief. The anomalies all have short strike lengths, and/or local offsets which suggest a series of northeast striking faults is present.

Only four of the HLEM anomalies have been previously tested by diamond drilling. All of the remainder, except for 'F' and 'I' which probably have surficial sources, are possible drill targets. It is recommended that priority be given to anomalies which represent the strongest conductors: Anomalies 'A', on Line 1000 East, 'D', on 1125 East, and 'N', on Line 2500 East. Anomaly 'M' should also be tested because it has an associated magnetic response.

It is also recommended that Anomaly 'G', which represents a very conductive source be tested by resurveying with a longer cable length. The anomaly is only present on one line, and has a very little quadrature response. The six anomalies labelled 'P' through 'U' could also be checked with a longer cable length to determine if they represent very weak surficial sources, or deep bedrock conductors.

Lines 2125 and 2250 East should be surveyed between 600 and 1200 South when ice conditions permit. This would test the western extent of Anomaly 'N'.



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## INTRODUCTION

During September and October 1990, magnetic and horizontal loop electromagnetic (HLEM) surveys were carried out for Comstate Resources Ltd. over 54 claims in Hanna Township.

The property is located approximately fifty kilometres northeast of the city of Timmins in the Porcupine Mining Division (Figure 1). The claims, located in the southeast portions of Hanna Township, are numbered as follows (Figure 2):

P1034847 - P1034854 inclusive

P1034865

P1975256

P1089116 - P1089123 inclusive

P1089136 - P1089151 inclusive

P1089158 - P1089173 inclusive

P1112618 - P1112621 inclusive

The property was accessed via a Concession Road which branches west from Highway 11.

The field data was collected by J. DerWeduwen, B. Pigeon and S. Ryan.

## GENERAL GEOLOGY

The general geology of the area is interpreted from airborne EM and magnetic surveys, and also from limited drill holes. There is a thick overburden cover,

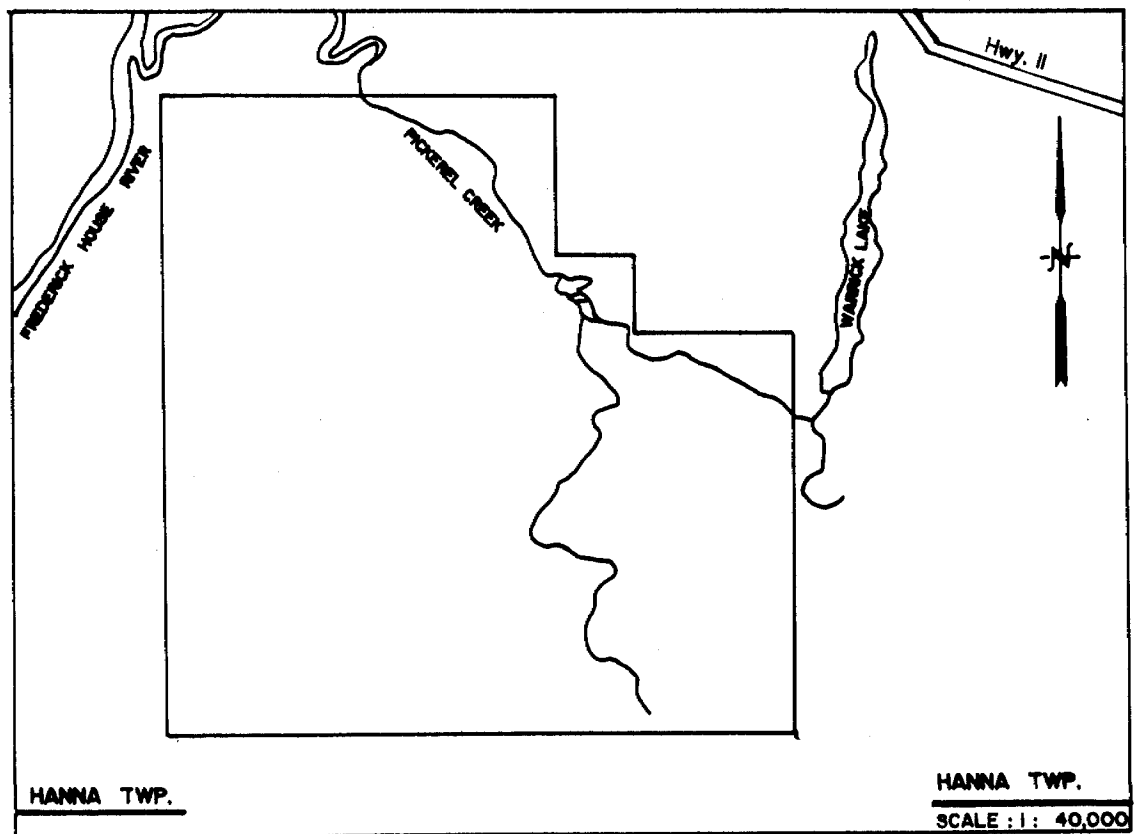
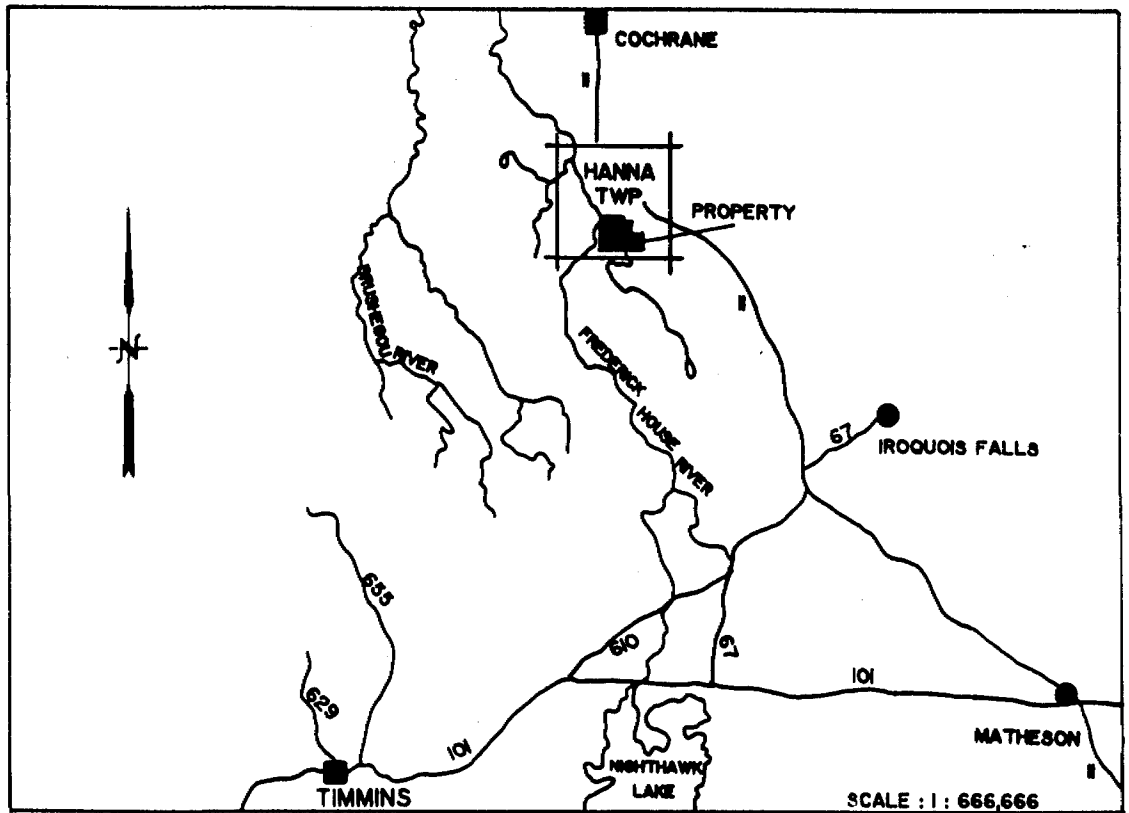
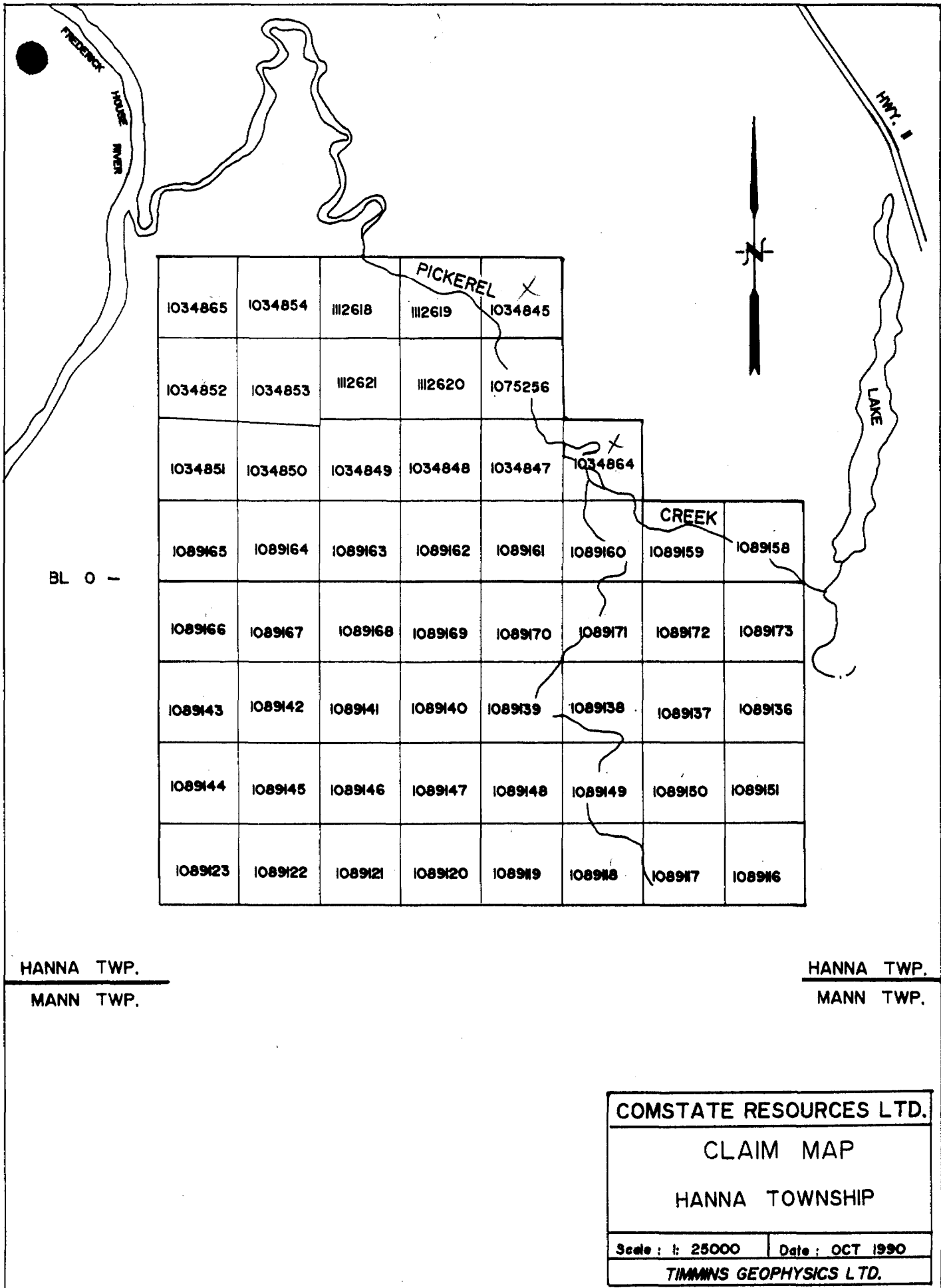


Figure 1(a) (b) : Location Maps



1034865	1034854	112618	112619	1034845			
1034852	1034853	112621	112620	1075256			
1034851	1034850	1034849	1034848	1034847	1034864		
1089165	1089164	1089163	1089162	1089161	1089160	1089159	1089158
1089166	1089167	1089168	1089169	1089170	1089171	1089172	1089173
1089143	1089142	1089141	1089140	1089139	1089138	1089137	1089136
1089144	1089145	1089146	1089147	1089148	1089149	1089150	1089151
1089123	1089122	1089121	1089120	1089119	1089118	1089117	1089116

BL 0 -

HANNA TWP.  
MANN TWP.

HANNA TWP.  
MANN TWP.

COMSTATE RESOURCES LTD.	
CLAIM MAP	
HANNA TOWNSHIP	
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overlying a sequence of Archean volcanic and sedimentary rocks. The composition of the volcanics vary from ultramafic to felsic. Airborne conductors are confined to a highly carbonatized basaltic unit. Offsets and terminations of these conductors suggest that a series of northeast faults may be present. A major northwest trending fault passes through the eastern portion of property.

#### PREVIOUS WORK

Table 1 is a summary of the previous work carried out over portions of the 54 claims covered in this report.

YEAR	COMPANY	GEOPHYSICS	DRILL HOLES	ASSESSMENT FILE
1989	COMSTATE RESOURCES LTD.			T-3316
1977	SHELL	HLEM, MAG		T-1906
1977/76	GEOPHYSICAL ENGINEERING LIMITED	MAG	DDH 4-5	T-1764
1975	BRASCAN RESOURCES LIMITED	AIREM, AIRMAG GROUND EM, MAG,		T-1693
1972	DUNCAN R. DERRY LIMITED	TURAM, MAG		T-1554
1965	CROMARTY EXPLORATION CO. LIMITED		C5-1 TO C5-5	T-1049
1951/50	CANADIAN JOHNS-MANVILLE CO. LIMITED	MAG		T-459

Table 1. Summary of Previous Work



In 1989, Comstate Resources Ltd. filed a geology survey over 34 claims which covered the northern part of the present property.

In 1977, Shell carried out HLEM and magnetic surveys over eight claims in the northern portion of the property.

In 1976, Geophysical Engineering Limited carried out a magnetic survey over seven claims located in Concession I, Lots 4 and 5. Five of these claims are on the present survey area. One drill hole, PP4-5, was drilled and located seventeen feet of 60% graphitic shale with 9% pyrrhotite and 1% pyrite. Three other narrow zones of 20% graphite with minor iron sulphides were also intersected in the hole. This hole is approximately located on Map 1.

In 1975, Brascan Resources Limited (now Western Mines) carried out airborne EM and magnetic surveys over several claim groups in Hanna and surrounding townships. Three anomalies, located on a six claim group in N1/2 Concession II and S1/2 Concession III, Lot 8 were followed up with ground HLEM and magnetic surveys.

In 1972, Duncan R. Derry Limited carried out Turam and magnetic surveys over three claims located in N1/2 Concession I, Lot 6.

In 1965, Cromarty Exploration Co. Limited drilled six holes. Their approximate locations are given on Map 1. The conductors intersected were graphitic units with minor sulphides.

In 1950 and 1951, Canadian Johns-Manville co. Limited carried out a magnetic survey over twenty-four claims situated in the central and southern areas of the present survey area. This company was searching for asbestos in ultramafic bodies.

## SURVEY DESCRIPTIONS

The grid on the property consists of north-south lines spaced every 125 metres and picketed every 25 metres (Figure 3).

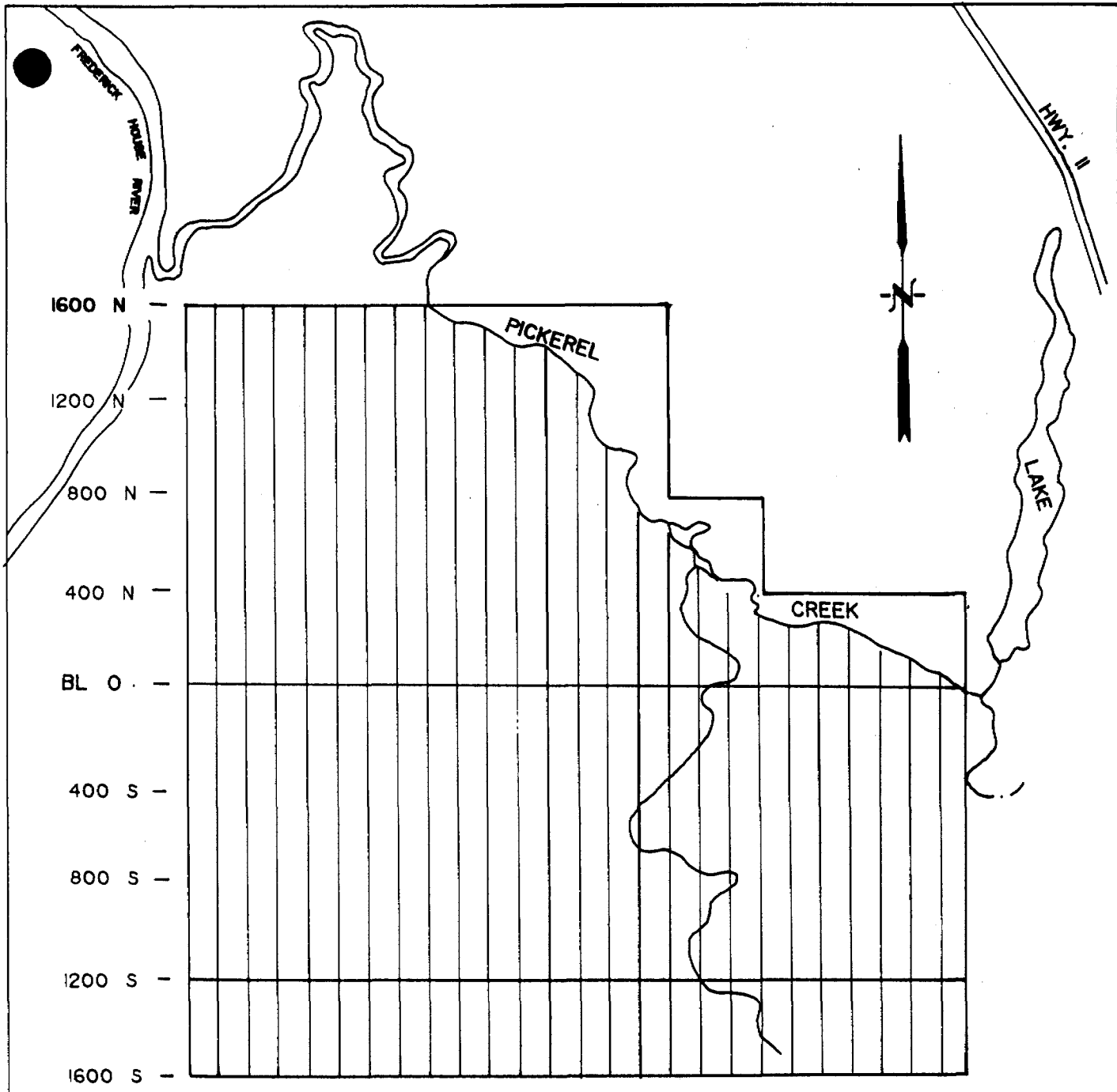
The horizontal loop EM survey was carried out with the Apex Parametrics MaxMin I. This instrument measures the in-phase and quadrature components of the secondary field as a percentage of the primary field. Readings were taken every 25 metres using a coil separation of 150 metres and frequencies of 444 and 1777 Hertz.

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.

## HLEM RESULTS

The results of the HLEM survey are given in maps 1 and 2 at a scale of 1:5000. Table 2 is a summary of the results; a '+' sign after the strike length indicates the anomaly extends beyond the survey limits. The predominant strike direction is west northwest in the western half and northwest in the east. The anomalies have numerous offsets and abrupt terminations, indicating faults are present.

There is a large variation in the readings over the property, particularly in the quadrature component. This variation, caused by bedrock topography, is greatest on the 1777 Hz results, and therefore, anomaly positions are better defined on the low frequency results. Anomaly amplitudes are low on the 444 Hz



HANNA TWP.  
MANN TWP.

- LINE 0
- LINE 125 E
- LINE 250 E
- LINE 375 E
- LINE 500 E
- LINE 625 E
- LINE 750 E
- LINE 875 E
- LINE 1000 E
- LINE 1125 E
- LINE 1250 E
- LINE 1375 E
- LINE 1500 E
- LINE 1625 E
- LINE 1750 E
- LINE 1875 E
- LINE 2000 E
- LINE 2125 E
- LINE 2250 E
- LINE 2375 E
- LINE 2500 E
- LINE 2625 E
- LINE 2750 E
- LINE 2875 E
- LINE 3000 E
- LINE 3125 E
- LINE 3250 E

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results because of the deep overburden. A longer cable length would give stronger responses, however interference between the closely spaced anomalies would be greater.

ANOMALY	STRIKE DIRECTION	STRIKE LENGTH (M)	DEPTH (M)	WIDTH (M)	CONDUCTIVITY THICKNESS (MHOS)	MAGNETIC ASSOCIATION
A	WEST NORTHWEST	1375+	48-90	NARROW-25	VERY GOOD	LOW RELIEF
B	NORTHWEST	125	75	NARROW-25	GOOD	LOW RELIEF
C	WEST NORTHWEST NORTHWEST/EAST-WEST	2000+	60	25-80	GOOD	LOW RELIEF
D	WEST NORTHWEST	1125+	75	NARROW-25	GOOD	LOW RELIEF
E	NORTHWEST	625+	15-45	NARROW	MODERATE	LOW RELIEF
F	NORTHEAST/NORTHWEST	375	<15	NARROW	POOR	CROSSCUTS TREND
G	?	<125	25	78	VERY GOOD	NORTH EDGE OF HIGH
H	WEST NORTHWEST/EAST-WEST	500+	45	0-25	POOR	CROSSCUTS TREND
I	?	<125	<15	NARROW	POOR	LOW RELIEF
J	?	<125	75	NARROW	MODERATE	LOW RELIEF
K	NORTHWEST	250	45	NARROW-25	MODERATE	LOW RELIEF
L	EAST-WEST	625	15-30	NARROW-12	POOR	SOUTH EDGE OF LINEAR HIGH
M	NORTHWEST	1125+	40	NARROW-50	POOR	STRONG COINCIDENT HIGH
N	EAST-WEST	125+	85	11-58	EXCELLENT	SOUTH EDGE OF HIGH
O	NORTHWEST	250	25-80	25-80	VERY GOOD	SOUTH EDGE OF HIGH

TABLE 2: Summary of Anomalies

#### ANOMALY 'A'

Anomaly 'A' is the most northern anomaly. It strikes west northwest between Lines 0 and 500 East and northwest from 875 to 1375 East. The dip is undetermined because of incomplete profiles, and also because of interference

from Anomalies 'B' and 'C', located 300 metres to the south. A vertical dip is assumed for the depth and conductivity calculations. Table 3 indicates the source is a moderate to good conductor with narrow width located at an average depth of 70 metres. Both depth and conductivity-thickness are much greater on Lines 875 and 1000 East. Hole C5-4, drilled by Cromarty Exploration Co. Limited, probably tested this zone near Line 0 East. Graphitic argillite with minor pyrite was determined to be the anomaly source.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
0 E	1525 N	?	?	?	?	?	INCOMPLETE PROFILE ASSUME DIP = 90
125 E	1500 N	NARROW	-11	-6	58	30	
250 E	1475 N	NARROW	-8	-4	74	44	
375 E	1437 N	NARROW	-4	-3	75	23	
500 E	1425 N	NARROW	0	2	?	?	
875 E	1450 N	NARROW	-3	-1	>90	100	
1000 E	1380 N	10	-6	-2	80	60	
1250 E	1275 N	NARROW	-5	-4	66	19	
1375 E	1237 N	12	-6	-7	48	10	

Table 3: Anomaly 'A', 444 Hz, 150 metre coil separation.

#### ANOMALY 'B'

Anomaly 'B' strikes northwest between Lines 1125 and 1250 East. A dip cannot be determined because of interference from Anomaly 'A' to the north and Anomaly 'C' to the south. The anomaly outlines a good conductor at a 75 metre depth (Table 4). The conductor intersected in Hole C5-2A, which probably represents this zone, consisted of graphitic argillite with massive pyrite stringers six

inches wide. Small amounts of silver, copper and zinc were found in assays of the andesitic rock core.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
1125 E	1112 N	25	-6	-4	75	27	ASSUME DIP = 90
1250 E	1037 N	NARROW	-4	-3	75	23	

Table 4. Anomaly 'B', 444 Hz, 150 coil separation.

#### ANOMALY 'C'

Anomaly 'C' strikes west northwest between Lines 0 and 2000 East. At the eastern edge, the strike is almost east-west. The source consists of at least two distinct conductive zones. The northern zone is a stronger conductor on Lines 250 and 275 East, and the southern zone is a better conductor on Lines 500 and 600 East. It is difficult to distinguish between the two responses on the other lines. A dip cannot be determined because of the two closely spaced responses. The conductivity-thickness of the source varies from poor to excellent, and the depth averages 60 metres (Table 5). Hole C5-1 tested this zone near Line 100 East and intersected one foot of pyrite. The host rock was andesite and peridotite, which contained fractures with minor chalcopyrite and pyrrhotite.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
0	1212 N	75	-6	-5	62	19	2 CONDUCTORS
125 E	1187 N	75	-6	-6	52	11	ASSUME DIP = 90
250 E	1134 N	118	-10	-4	68	76	NORTH CONDUCTOR
			-1	0	?	?	SOUTH CONDUCTOR
375 E	1109 N	117	-8	-6	60	23	NORTH CONDUCTOR
			-4	-5	50	8	SOUTH CONDUCTOR
500 E	1066 N	83	-4	-5	50	8	NORTH CONDUCTOR
			-9	-3	74	76	SOUTH CONDUCTOR
625 E	1012 N	75	-9	-6	60	42	
750 E	962 N	50	-10	-5	63	49	
875 E	900 N	50	-7	-3	78	57	
1000 E	844 N	37	-5	-3	50	28	
1125 E	800 N	NARROW	-5	-3	50	28	
1250 E	756 N	12	-4	-3	75	23	
1375 E	687 N	25	-6	-4	75	27	
1500 E	687 N	25	-7	-4	75	30	
1625 E	687 N	25	-5	-4	74	19	
1750 E	687 N	25	-3	-5	30	4	
1875 E	650 N	NARROW	-3	-6	22	6	
2000 E	633 N	17	-9	-6	60	42	

Table 5: Anomaly 'C', 444 Hz, 150 metre coil separation.

#### ANOMALY 'D'

Anomaly 'D' strikes west northwest between Lines 0 and 1125 East. The response on Lines 250 East to 625 East is much weaker and is offset 50 metres to the south. The poor response is probably due to a greater depth of the source in this area. The source is a very good conductor at an average of 80 metres depth (Table 6). The width is narrow, except on Lines 125 and 1125 East, where widths of 12 and 25 metres are calculated.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
0	850 N	NARROW	-5	-4	66	19	ASSUME DIP = 90
125 E	806 N	12	-3	-2	75	28	
250 E	700 N	NARROW					
375 E	650 N	NARROW	-1	-1	?	?	RESPONSE TOO
500 E	600 N	NARROW	-1	-2	?	?	WEAK FOR CALCULATION
625 E	550 N	NARROW			?	?	
750 E	487 N	NARROW			?	?	
875 E	500 N	NARROW	-1	0	?	?	
1000 E	475 N	NARROW	-2	-1	>90	42	ASSUME DIP = 90
1125 E	437 N	25	-6	-3	80	42	

Table 6: Anomaly 'D', 444 Hz, 150 metre coil separation.

#### ANOMALY 'E'

Anomaly 'E' strikes northwest between Lines 2625 East and 3250 East. The response is primarily on the quadrature component, indicating that the source has a low to moderate conductivity thickness (Table 7). The depth varies from 15 to 45 metres; probably because of inaccurate calculations caused by interference from Anomaly 'F' to the south.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
2625 E	300 N (S EDGE)	?	?	?	?	?	INCOMPLETE PROFILE
2750 E	200 N	NARROW	-3	-6	22	6	ASSUME DIP = 90
2875 E	75 N (N EDGE)	?	-3	-4	45	6	INTERFERENCE FOR 'H'
3000 E	50 S (N EDGE)	?	-2	-5	15	2	
3125 E	125 S	NARROW	-1	-1	?	?	RESPONSE TOO LOW
3250 E	225 S	NARROW	-1	0	?	?	FOR CALCULATIONS



Table 7: Anomaly 'E', 444 Hz, 150 coil separation.

**ANOMALY 'F'**

Anomaly 'F' strikes east northeast between Lines 2625 East and 2875 East, then strikes northwest to Line 3000 East. The response is much stronger on the quadrature component, indicating a very weak source near surface (Table 8). The response most probably represents a surficial conductor.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
2625 E	87 S	NARROW	-1	-5	<15	<2	
2750 E	62 S	NARROW	-1	-6	<15	<1	
2875 E	50 S (S EDGE)	?	-1	-7	<15	<1	
3000 E	125 S (S EDGE)	?	-2	-8	<15	2	INTERFERENCE FROM 'G'

Table 8: Anomaly 'F', 444 Hz, 150 coil separation.

**ANOMALY 'G'**

Anomaly 'G' is a one-line response at 400 North on Line 125 East. The response is primarily on the in-phase component, and it is recommended that it be checked with a longer cable length to ensure it is not caused by a coil misalignment and to possibly expand its strike length. If the anomaly is true, the source represents one of the most conductive sources on the property (Table 9).

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
125 E	387 N	25	-6	-2	78	80	ASSUME DIP = 90

Table 9: Anomaly 'G', 444 Hz, 150 metre coil separation.

#### ANOMALY 'H'

Anomaly 'H' strikes east-west between Lines 0 and 500 East. It represents a poor conductor at an average depth of 45 metres (Table 10). Positive quadrature values indicate it is located on a bedrock high. A dip cannot be determined because of the low in-phase response. The width, which is narrow on most lines, may be inaccurate due to the low response amplitude.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
0	175 S	NARROW	-1	-2	45	3	ASSUME DIP = 90
125 E	237 S	25	-1	-2	45	3	
250 E	250 S	NARROW	-1	-2	45	3	
375 E	250 S	NARROW	-1	-5	<15	<2	
500 E	267 S	NARROW	-1	-1	75	10	

Table 10: Anomaly 'H', 444 Hz, 150 metre coil separation.

## ANOMALY 'I'

Anomaly 'I' is only present on Line 500 East. It is located on a bedrock high, characterized by positive quadrature responses to the south, east and west. The source is a very weak conductor at very shallow depth (Table 11). These calculations suggest the source may be surficial.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
500 E	450 S	NARROW	-1	-5	<15	<2	ASSUME DIP = 90

Table 11: Anomaly 'I', 444 Hz, 150 metre coil separation.

## ANOMALY 'J'

Anomaly 'J' is a one line response located at 625 East. It may be a faulted extension of Anomaly 'H'. The anomaly represents a moderate conductor at 75 metres depth (Table 12).

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
625 E	367 S	NARROW	-2	-2	75	12	ASSUME DIP = 90

Table 12: Anomaly 'J', 444 Hz, 150 metres coil separation.

**ANOMALY 'K'**

Anomaly 'K' strikes northwest between Lines 250 and 500 East. The response indicates the source varies from a poor to moderate conductor at depths from 15 to 75 metres (Table 13). Positive quadrature readings on either side of the anomaly indicate high bedrock topography, and influence from this feature may cause errors in calculations. If the bedrock high is continuous beneath the anomaly, rather than present on either side, then the source is weaker and shallower than the calculated values below. The variation in calculations suggest this is the probable case.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
250 E	612 S	NARROW	-2	-2	75	10	ASSUME DIP = 90
375 E	712 S	25	-2	-3	45	6	
500 E	762 S	NARROW	-1	-3	15	2	

Table 13: Anomaly 'K', 444 Hz, 150 metre coil separation.

**ANOMALY 'L'**

Anomaly 'L' strikes west northwest between Lines 625 and 1250 East. The response is much stronger on the quadrature component, indicating that the source has a poor conductivity-thickness. The calculated depth varies from 15 to 45

metres (Table 14).

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
625 E	862 S	NARROW	-1	-2	45	3	ASSUME DIP = 90
750 E	894 S	12	-3	-5	30	4	
875 E	912 S	NARROW	-2	-6	15	2	
1000 E	925 S	NARROW	-1	-4	15	2	
1125 E	900 S	NARROW	-1	-2	15	2	
1250 E	950 S	NARROW	-1	-2	30	3	

Table 14: Anomaly 'L', 444 Hz, 150 metre coil separation.

#### ANOMALY 'M'

Anomaly 'M' strikes northwest between 500 South on Line 2500 East and 1050 South on Line 3125 South. The anomaly represents a weak conductor at an average depth of 40 metres (Table 15). The width is narrow.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
2500 E	500 S	NARROW	-1	+6	?	?	ON BEDROCK HIGH
2625 E	582 S	NARROW	-2	-4	30	3	
2750 E	700 S	NARROW	-1	-2	45	2	
2875 E	775 S	NARROW	0	-1	?	?	
3000 E	912 S	NARROW	-1	-3	15	2	
3125 E	1050 S	NARROW	-1	-2	45	2	

Table 15: Anomaly 'M', 444 Hz, 150 coil separation.

## ANOMALY 'N'

Anomaly 'N' is present only on Lines 2375 and 2500 East. It is a very strong conductor at a depth of 80 to 90 metres (Table 16). The large width and the shape of the profile indicates there are at least two distinct conductors on Line 2375 East. There are no positive shoulders on the in-phase component and it is assumed that the dip is vertical for calculations. The positive quadrature readings on either side of the anomaly reflect high bedrock topography.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
2375 E	921 S	58	-4	-1	>90	100	TWO CONDUCTORS ASSUME DIP = 90
2500 E	911 S	11	-8	-1	82	>100	

Table 16: Anomaly 'N', 444 Hz, 150 metre coil separation.

## ANOMALY 'O'

Anomaly 'O' is present between Lines 2625 and 2875 East. It strikes northwest and is comprised of several distinct conductors. Table 17 indicates a very conductive source at an average depth of 62 metres. This zone is the probable target of Hole PP4-5, drilled by Geophysical Engineering Limited in 1977. Four distinct graphitic horizons were intersected over approximately 40 metres.

LINE	ANOMALY CENTRE	ANOMALY WIDTH (M)	IP (%)	Q (%)	DEPTH (M)	CONDUCTIVITY THICKNESS (MHOS)	COMMENTS
2625 E	877 S	30	-8	-4	74	44	ASSUME DIP = 90
2750 E	921 S (N EDGE)		-15	-6	52	61	
	1000 S (S EDGE)		-8	-7	54	17	
2875 E	1012 S	25	-9	-4	70	60	

Table 17: Anomaly 'O', 444 Hz, 150 metre coil separation.

Six additional anomalies are indicated on Map 1. They are labelled 'P', 'Q', 'R', 'S', 'T' and 'U'. All have very little or no in-phase response, and calculations cannot be carried out. All of the above anomalies may be weak because of a large depth to the source, and a HLEM survey using a longer cable length may better define these marginal anomalies.

#### MAGNETIC RESULTS

The magnetic results are plotted on Map 3 at a scale of 1:5000.

The major feature in the results is a west northwest striking magnetic high through the center of the property, and a smaller parallel feature. These two highs map ultramafic rock units. The low magnetic relief north and south of the ultramafics map areas underlain by intermediate and mafic volcanics.

Minor offsets in the magnetic contours suggest the presence of a series of northeast trending faults. This is compatible with the offsets and terminations

of the HLEM anomalies.

All anomalies except 'G', 'L', 'M', 'N', and 'O', lie within the area of low relief. Anomaly 'L' is located at the south edge of the smaller linear magnetic feature mentioned above. Anomalies 'N' and 'O' lie at the southern edge of the major magnetic high and Anomaly 'M' lies at its northern edge, and has a strong associated response of its own. Anomaly 'G' lies to the north of the major magnetic feature within the region of the high magnetic gradient.

Dec 12/90

DATE

Sharon Taylor

SHARON TAYLOR  
TIMMINS GEOPHYSICS LTD.



**APPENDIX A**

LIST OF CLAIMS - HANNA TOWNSHIP

P - 1034847	P - 1089136	P - 1089160
1034848	1089137	1089161
1034849	1089138	1089162
1034850	1089139	1089163
1034851	1089140	1089164
1034852	1089141	1089165
1034853	1089142	1089166
1034854	1089143	1089167
1034865	1089144	1089168
1075256	1089145	1089469
1089116	1089146	1089170
1089117	1089147	1089171
1089118	1089148	1089172
1089119	1089149	1089173
1089120	1089150	1112618
1089121	1089151	1112619
1089122	1089158	1111620
1089123	1089159	1112621

TOTAL CLAIMS = 54



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) GEOPHYSICAL  
Township or Area HANNA TOWNSHIP  
Claim Holder(s) COMSTATE RESOURCES LTD.  
901.1015-4th St. SW, Calgary, Alberta T2R 1S4  
Survey Company Timmins Geophysics Ltd.  
Author of Report S. Taylor  
Address of Author P.O. Box 1783, South Porcupine, Ont. P0N 1H0  
Covering Dates of Survey Aug 31/90 - Oct. 15/90  
(linecutting to office)  
Total Miles of Line Cut 67.1 km

**MINING CLAIMS TRAVERSED**  
List numerically

SEE ATTACHED LIST  
(prefix) (number)

**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	
-Electromagnetic	<u>20</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: Dec 12/90 SIGNATURE: Shawn Taylor  
Author of Report or Agent

Res. Geol. \_\_\_\_\_ Qualifications \_\_\_\_\_

**Previous Surveys**

File No.	Type	Date	Claim Holder

TOTAL CLAIMS 54

OFFICE USE ONLY

If space insufficient, attach list

GEOPHYSICAL TECHNICAL DATA

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

MAG - 3785

Number of Stations 2710 Number of Readings HLEM - 2489

Station interval 25 metres Line spacing 100 metres

Profile scale 1 cm = 20% (444 Hz) -- 1 cm = 40% (1777 Hz)

Contour interval 100 gammas

MAGNETIC

Instrument Scintrex IGS-2/MP-4

Accuracy - Scale constant ± .1 gamma

Diurnal correction method Scintrex MP-3 Base Station Magnetometer

Base Station check-in interval (hours) 20 seconds

Base Station location and value Line 250 East - 1220 South 58539

ELECTROMAGNETIC

Instrument Apex Parametrics MaxMin I

Coil configuration Horizontal Loop

Coil separation 150 metres

Accuracy 1%

Method:  Fixed transmitter  Shoot back  In line  Parallel line

Frequency 444 & 1777 Hz (specify V.L.F. station)

Parameters measured In-phase and quadrature components of secondary field measured as percent of primary 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



42A15NW0002 2.13767 HANNA

900

Mining Act

Report of Work (Geophysical, Geological and Geochemical Surveys)

60515

Type of Survey(s) <b>GEOPHYSICAL</b>	Mining District <b>PORCUPINE</b>	Township <b>HANNA TOWNSHIP</b>
Recorded Holder(s) <b>COMSTATE RESOURCES LTD.</b>	Prospector's Licence No. <b>2,13767</b> T-1127	
Address <b>Suite 901, 1015 4th St. S.W., Calgary, Alberta T2R 1J4</b>		Telephone No. <b>(403)265-6973</b>
Survey Company <b>TIMMINS GEOPHYSICS LTD</b>		
Name and Address of Author (of Geo-Technical Report) <b>D. Londry, P.O. Box 1783, South Porcupine, Ontario PON 1H0</b>		Date of Survey (from & to) 31 Oct 90 to 15 Nov 90

Credits Requested per Each Claim in Columns at right

Mining Claims Traversed (List in numerical sequence)

Special Provisions	Geophysical	Days per Claim
For first survey:	Geophysical	
Enter 40 days. (This includes line cutting)	- Electromagnetic	20
	- Magnetometer	40
For each additional survey: using the same grid:	- Other	
Enter 20 days (for each)	Geological	
	Geochemical	
Man Days	Geophysical	Days per Claim
Complete reverse side and enter total(s) here	- Electromagnetic	
	- Magnetometer	
	- Other	
	Geological	
	Geochemical	
Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Other	

Mining Claim		Mining Claim		Mining Claim	
Prefix	Number	Prefix	Number	Prefix	Number
SEE ATTACHED LIST					
RECEIVED					
OCT 05 1990					
MINING LANDS SECTION					
RECORDED					
OCT 22 1990					

Total miles flown over claim(s).  
Date: Oct. 22, 1990  
Recorded Holder or Agent (Signature): *Douglas*

Total number of mining claims covered by this report of work. **54**

Certification Verifying Report of Work

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

Name and Address of Person Certifying  
**D. Londry, P.O. Box 1783, South Porcupine, Ontario PON 1H0**

Telephone No. (705)235-4592  
Date: Oct. 22, 1990  
Certified By (Signature): *Douglas*

**For Office Use Only**

Total Days Cr. Recorded: **3240**

Date Recorded: **OCT. 22/90**  
Mining Recorder: *Robert Bunting*

Date Approved as Recorded: \_\_\_\_\_  
Provincial Manager, Mining Lands: \_\_\_\_\_

**"ACTG"**

Received Stamp

**RECEIVED**  
OCT 22 1990  
2:30 *JB*

SEE REVISED WORK STATEMENT

LIST OF CLAIMS- HANNA TOWNSHIP

P - 1034847	P - 1089136	P - 1089160
1034848	1089137	1089161
1034849	1089138	1089162
1034850	1089139	1089163
1034851	1089140	1089164
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P - 1075256	1089145	1089169
P - 1089116	1089146	1089170
1089117	1089147	1089171
1089118	1089148	1089172
1089119	1089149	1089173
1089120	1089150	P - 1112618
1089121	1089151	1112619
1089122	1089158	1112620
1089123	1089159	1112621

TOTAL CLAIMS = 54

**2,13767**



Ontario

Ministry of  
Northern Development  
and Mines

Ministère du  
Développement du Nord  
et des Mines

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

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

Your File: W. 9006.60515  
Our File: 2.13767

March 8, 1991

Mining Recorder  
Ministry of Northern Development  
and Mines  
60 Wilson Avenue  
TIMMINS, Ontario  
P4N 2S7

Dear Sir/Madam:

RE: Notice of Intent dated February 7, 1991 for Geophysical  
(Electromagnetic) and Geophysical (Magnetometer) Surveys  
on mining claims P.1034847 et al in Hanna Township.

-----

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

WPM/jl  
Encl:

cc: Mr. W. D. Tieman  
Mining and Lands Commissioner  
Toronto, Ontario

Comstate Resources Ltd.  
Calgary, Alberta

D. Londry  
South Porcupine, Ontario



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) GEOPHYSICAL
Township or Area HANNA TOWNSHIP
Claim Holder(s) COMSTATE RESOURCES LTD.
901,1015-4th St. SW, Calgary, Alberta T2R 1S4
Survey Company Timmins Geophysics Ltd.
Author of Report S. Taylor
Address of Author P.O.Box 1783, South Porcupine, Ont. P0N 1H0
Covering Dates of Survey Aug 31/90 - Oct.15/90
Total Miles of Line Cut 67.1 km

MINING CLAIMS TRAVERSED
List numerically

Table with columns for prefix and number, containing 'SEE ATTACHED LIST' and a 'RECEIVED DEC 14 1990' stamp.

If space insufficient, attach list

Table titled 'SPECIAL PROVISIONS CREDITS REQUESTED' 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

DATE: Dec 12/90 SIGNATURE: Shaun Taylor
Author of Report or Agent

Res. Geol. Qualifications

Previous Surveys

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

TOTAL CLAIMS 54

OFFICE USE ONLY



GEOPHYSICAL TECHNICAL DATA

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

Number of Stations 2710 Number of Readings MAG - 3785 HLEM - 2489
Station interval 25 metres Line spacing 100 metres
Profile scale 1 cm = 20% (444 Hz) -- 1 cm = 40% (1777 Hz)
Contour interval 100 gammas

MAGNETIC

Instrument Scintrex IGS-2/MP-4
Accuracy - Scale constant +/- .1 gamma
Diurnal correction method Scintrex MP-3 Base Station Magnetometer
Base Station check-in interval (hours) 20 seconds
Base Station location and value Line 250 East - 1220 South 58539

ELECTROMAGNETIC

Instrument Apex Parametrics MaxMin I
Coil configuration Horizontal Loop
Coil separation 150 metres
Accuracy 1%
Method: [ ] Fixed transmitter [ ] Shoot back [x] In line [ ] Parallel line
Frequency 444 & 1777 Hz (specify V.L.F. station)

Parameters measured In-phase and quadrature components of secondary field measured as percent of primary 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

**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 \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Lamarche Twp.

THE TOWNSHIP OF  
OF

**HANNA**

DISTRICT OF  
COCHRANE

PORCUPINE  
MINING DIVISION

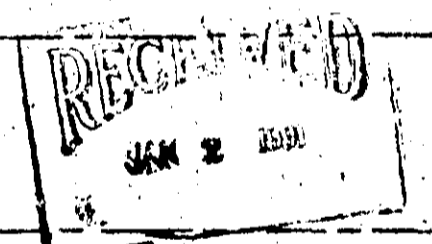
SCALE: 1-INCH=40 CHAINS

LEGEND

PATENTED LAND	Ⓟ
CROWN LAND SALE	C.S.
LEASES	Ⓛ
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
ROADS	— — — — —
IMPROVED ROADS	— — — — —
RAILWAYS	— + — + — + — + — + —
POWER LINES	— • — • — • — • — • —
MARSH OR MUSKEG	~ ~ ~ ~ ~
KING'S HIGHWAY	— (1) —

NOTES

400' Surface rights reservation around all lakes & rivers.



REG. PLAN NO. - M. 57 COVERS LOTS "A" TO "Z" IN CON. 3 TO CON. 6

Surface Rights Only reserved to Dept. of Lands & Forests shown thus: File R8767

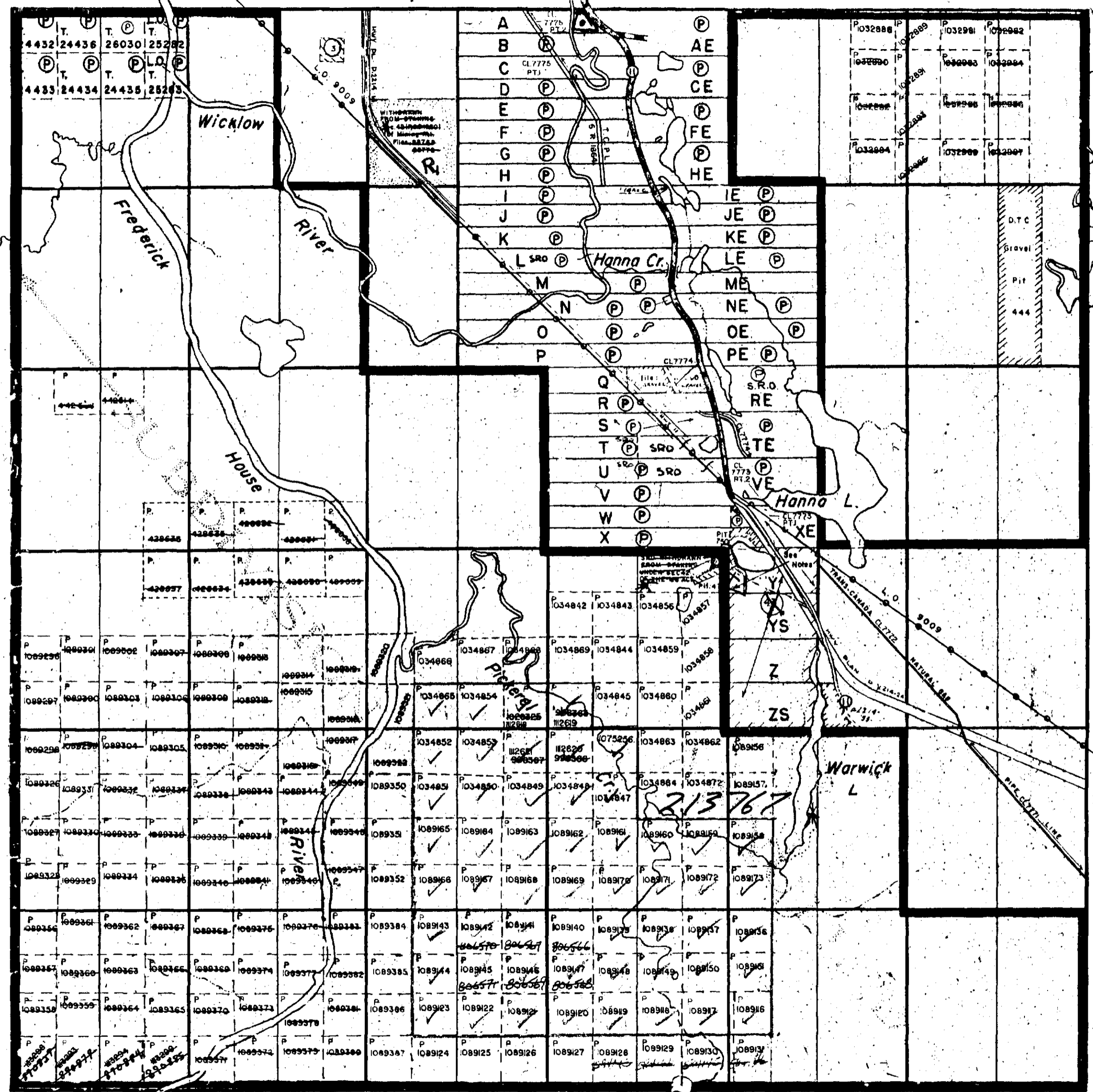
See L & F File 96605-122598 Re Grave: Jn Loc. XE & Loc. Y

Working under Section 19(1) of the Act (R.S.O. 1970)

W. 54/73 (45) 88775	27/11/73	S.R.O.
W. 32/74 (42) 86603	12/8/74	S.R. & M.R.
XERO V85 (41) 86603	01/14/85	SRO

R1 - S.R. & M.R. REOPENED FOR STAKING  
L.U.P. • \*  
X L.U.P. Reopened N.R.O. 7a/84  
Received May 5/80

PLAN NO. - M 490



Reaume Twp.

ST. John Twp.

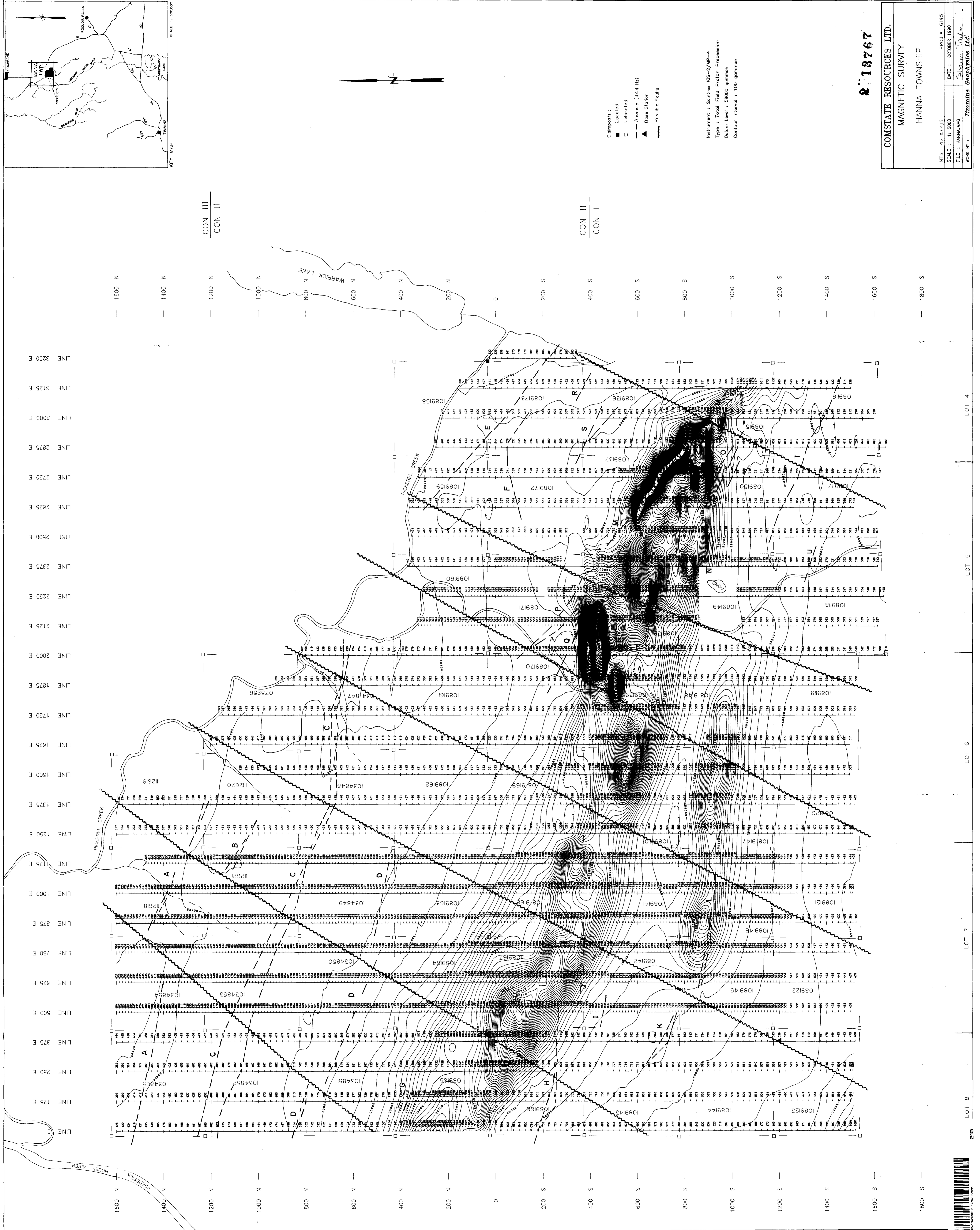
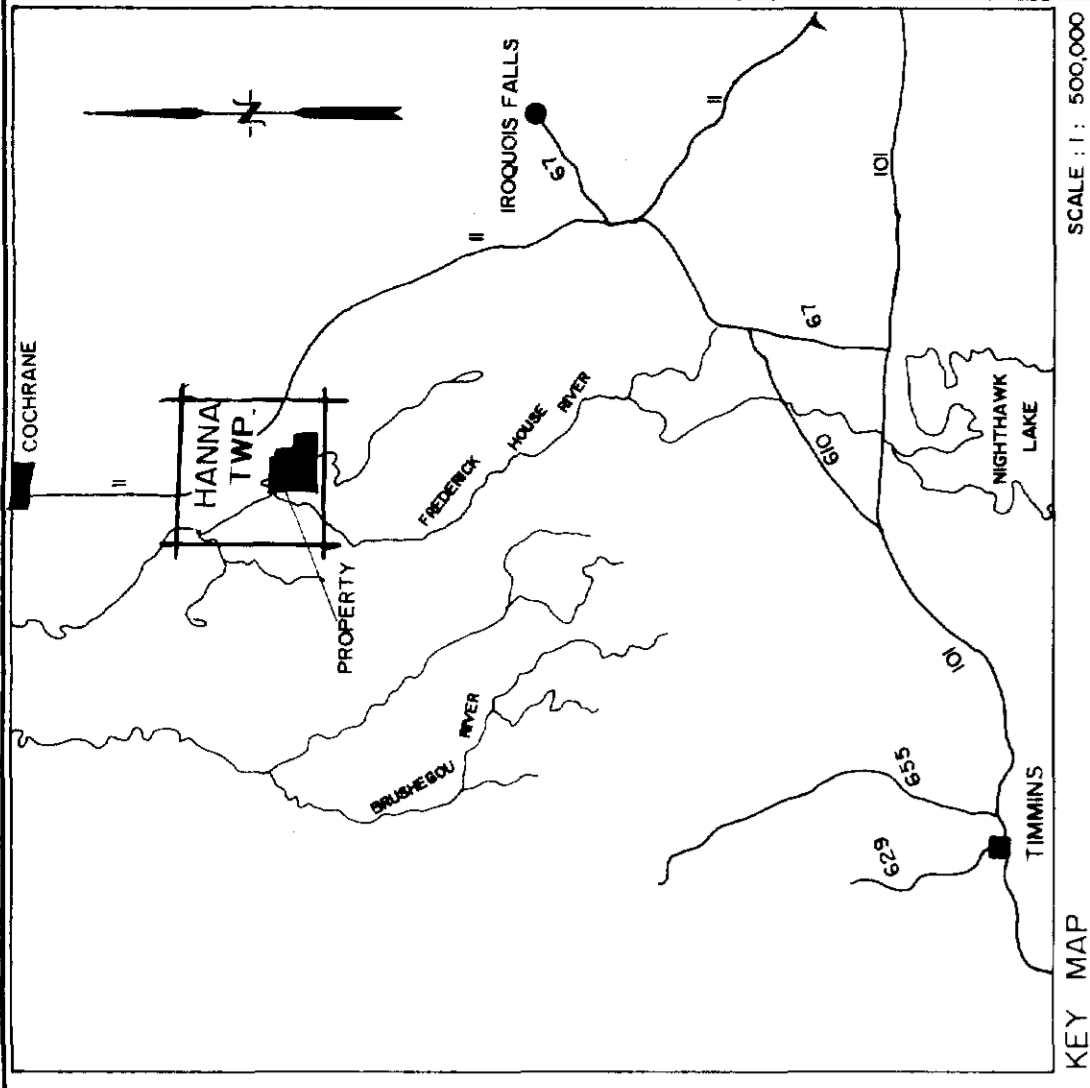
NOTICE THAT THIS MAP COMPILED FROM SOURCES, IS NOT TO BE USED FOR DEVELOPMENT PURPOSES, FOR ADJUSTMENT OF BOUNDARIES, OR FOR ANY OTHER PURPOSES HEREON.

12 11 10 9 8 7 6 5 4 3 2 1

Mann Twp.



42A15N0002 2.13767 HANNA



- Clampsets:
- Located
  - Unlocated
  - Anomaly (444 Hz)
  - ▲ Base Station
  - Possible Faults

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

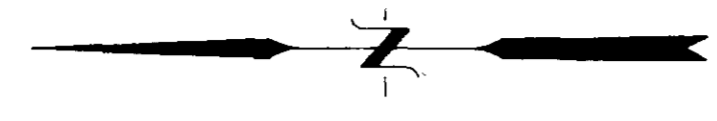
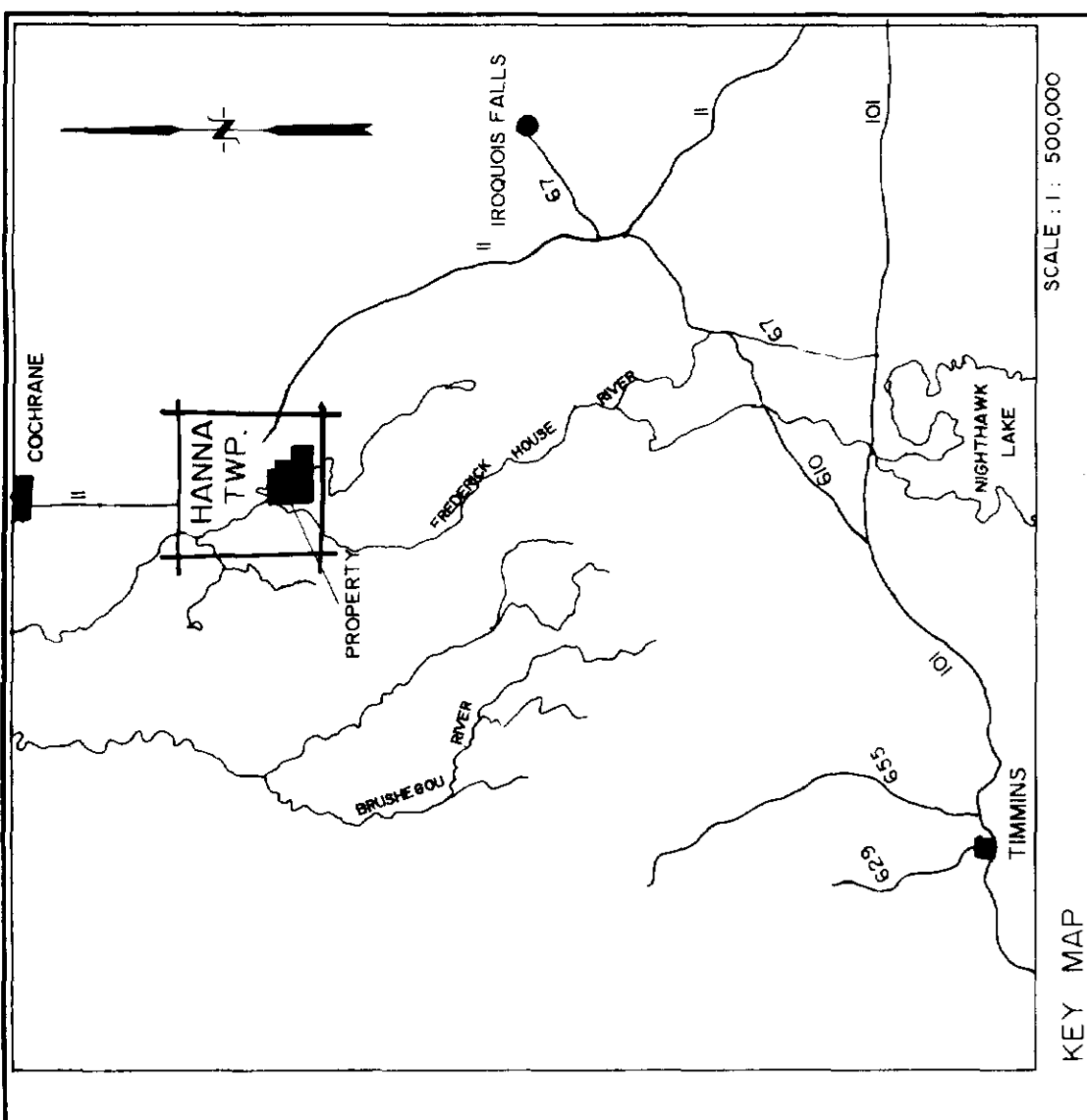
**2-18767**

COMSTATE RESOURCES LTD.  
 MAGNETIC SURVEY  
 HANNA TOWNSHIP

NTS : 42-A/14/5 PROJ. # : 6145  
 SCALE : 1:5000 DATE : OCTOBER 1990  
 FILE : HANNA/MAG  
 WORK BY : Timmins Geophysics Ltd.

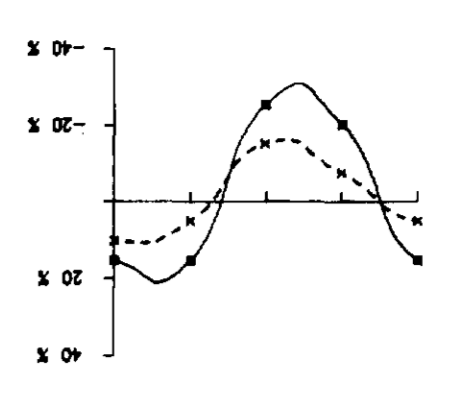
LOT 4 LOT 5 LOT 6 LOT 7 LOT 8





- Clompests:
- Located
  - Unlocated
  - Anomaly
  - DDH

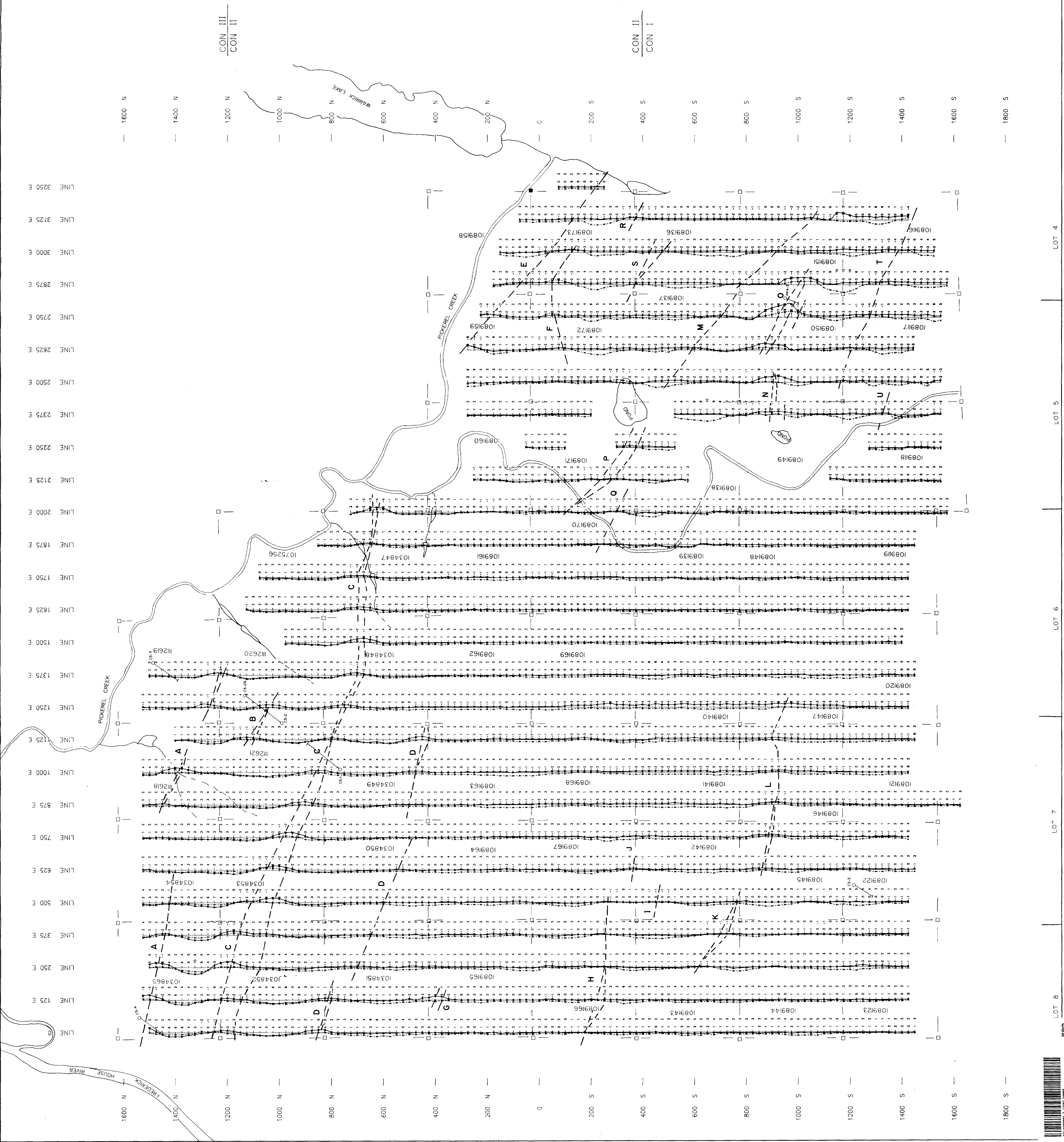
Instrument : Apex Parametrics MaxMin I  
 Frequency : 444 Hz  
 Coil Separation : 150 metres  
 Profile Scale : 1 cm = 20%



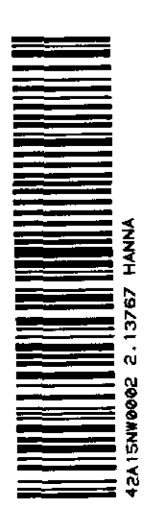
In-phase  
 Quadrature  
**2.18767**

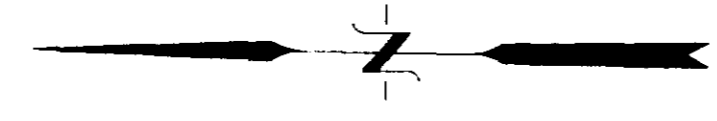
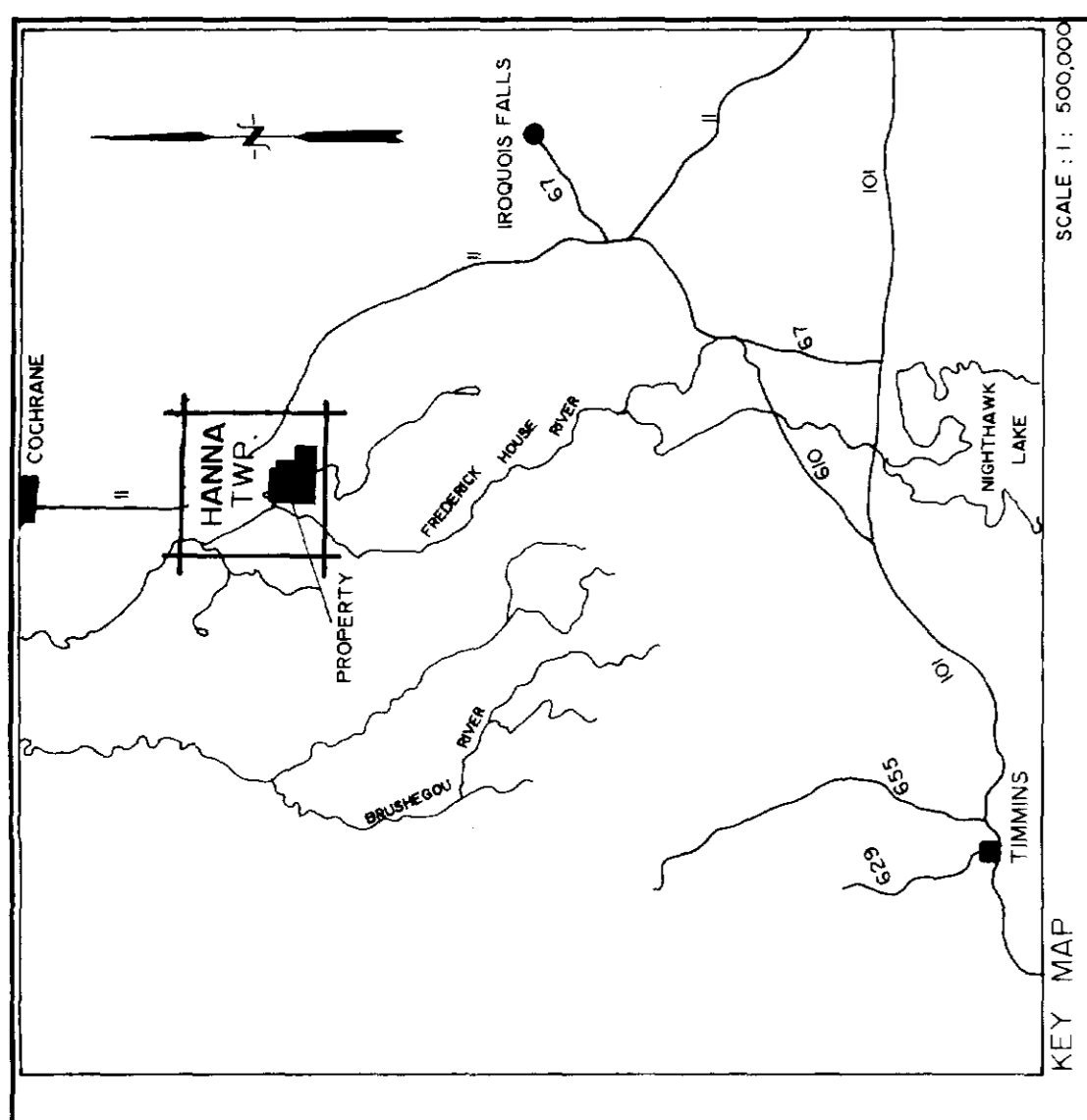
COMSTATE RESOURCES LTD.  
 HLEM SURVEY  
 HANNA PROPERTY

NTS : 42.2/1/15  
 SCALE : 1:5000  
 DATE : OCTOBER 1990  
 FILE : HANNA-HL  
 WORK BY : *[Signature]*  
 Phoenix Geophysics Ltd.



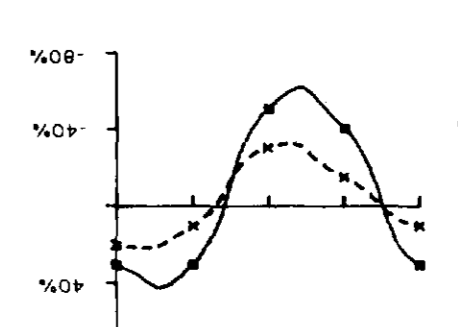
LOT 4  
 LOT 5  
 LOT 6  
 LOT 7  
 LOT 8





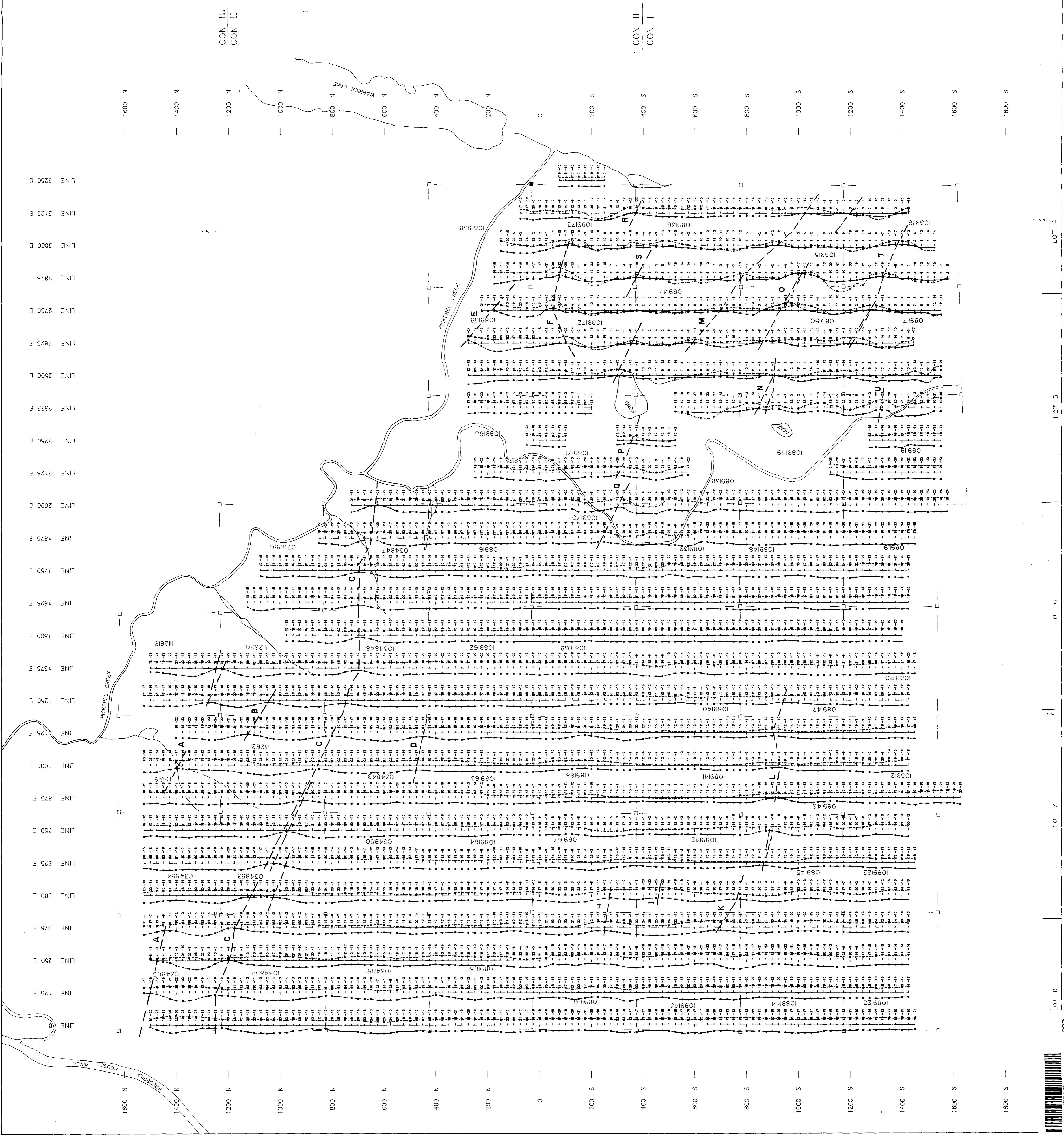
- Clampsets:
- Located
  - Unlocated
  - Anomaly

Instrument: Apex Parametrics MaxMin I  
 Frequency: 1777 Hz  
 Coil Separation: 150 metres  
 Profile Scale: 1 cm = 40%



2.13767

In-phase  
 Quadrature



COMSTATE RESOURCES LTD.  
 HLEM SURVEY  
 HANNA PROPERTY

NTS: 42-A/16/5  
 SCALE: 1:5000  
 DATE: OCTOBER 1990  
 FILE: HANNA-HL  
 WORK BY: *Shawna T. G.*  
 Thiazinis Geophysics Ltd.

LOT 4  
 LOT 5  
 LOT 6  
 LOT 7  
 LOT 8

