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**MINING LANDS SECTION**

GEOPHYSICAL REPORT

on the

MAGNETIC AND

ELECTROMAGNETIC SURVEYS

CONDUCTED ON THE EAST BLOCK

OF THE ROSARIO PROPERTY

LOCATED IN REID/MAHAFFY TOWNSHIPS

in the

PORCUPINE MINING DIVISION, ONTARIO

by: W.S. Mitchell  
September, 1980  
Toronto,  
Ontario.

## INTRODUCTION

As part of a joint-venture exploration agreement between Utah Mines Ltd. and Rosario Resources Canada Ltd., ground electromagnetic and magnetic surveys were carried out over two specific areas within the Rosario Reid/Mahaffy claim block.

The ground geophysical surveys were completed in January 1980, on two separate cut-line grids, established early in 1980 over groups of claims located in the extreme northwestern and eastern portions of the Rosario property. This report describes the electromagnetic and magnetic surveys completed over the Rosario east grid by Services Exploration under contract to Utah Mines Ltd.

## LOCATION AND ACCESS

The Rosario property straddles the Reid/Mahaffy township line and is located just west of the Mattagami River, approximately 65 km northwest of Timmins, Ontario. (fig.1)

The area is accessible by helicopter from Timmins. Alternative winter access is on snowmobile by crossing the Mattagami River at a point just south of the Ontario Hydro power dam which is normally accessible by road from Timmins. In summer, access by boat along the Mattagami River is also feasible.

## PROPERTY

The property comprises 119 contiguous claims held by Rosario Resources Canada Ltd. in Reid and Mahaffy townships.

The Rosario East Block is a contiguous group of claims which straddle the Reid/Mahaffy township line and is located in the eastern section of the Rosario claim block close to the Mattagami River.

Electromagnetic and magnetic surveys over a cut-line grid on the Rosario East Block covered the following six contiguous claims in Mahaffy township:

PROPERTY (Continued)

P. 499622, P. 499625 - P. 499627 inclusive, P. 506830,  
P. 506831,

and the following six contiguous claims in Reid Twp.:

P. 506824 - P. 506829 inclusive.

GENERAL DESCRIPTION OF GEOLOGY

The whole property is covered by extensive glacial overburden and there is no known outcrop within the area. On the basis of limited drill information it appears that the property is underlain by a sequence of metavolcanic and metasedimentary rocks with occasional north-northwest trending diabase dykes.

PREVIOUS WORK

A considerable amount of previous work in the area of Rosario Resources Ltd. Reid/Mahaffy claim group was completed after 1964, following the discovery in Kidd Township of the Kidd Creek Mine. Records in the assessment files show that in 1964 Keevil, Black River and Jacobies worked in the area and eight diamond drill holes are recorded. In 1965 Barrington ran JEM and magnetics in the area. In the same year United Porcupine drilled four holes along the Reid Mahaffy township line.

Conwest completed vertical loop electromagnetic and magnetic surveys in 1966 and drilled two holes. In 1972 Caltor conducted ground magnetic and electromagnetic surveys and drilled four diamond holes. In 1973 DEEPEX Syndicate ran Turam, magnetics and gravity and drilled two holes in the northwestern part of the property. Following an airborne INPUT survey, the results of which are not on assessment file, Phelps-Dodge in 1965 conducted Ronka HEM, magnetics and drilled one hole.

Rosario Resources Canada Ltd. claimed much of this area in 1977, and since then have conducted a variety of ground geophysical surveys over the property and have drilled a total of

## PREVIOUS WORK (Continued)

eight diamond drill holes. A further six diamond drill holes were drilled early in 1980 by Utah Mines Ltd. under the joint-venture agreement with Rosario Resources Canada Ltd.

## PRESENT SURVEY

A cut-line grid for the EM and magnetometer survey reported herein was established in December 1979 on the twelve claims covered by this survey. This grid was tied in to other existing grids on the property using the Township line as a baseline. This cut-line grid extends from Line 36/E to Line 68/E, and north-south cross lines cut at 400 foot spacing are picketed at 100 foot intervals. The EM and magnetometer surveys were completed in January and February of 1980. 11.4 miles of EM survey and 12.0 line miles of magnetometer survey were completed over this grid in the eastern claim block.

## METHOD OF SURVEY

### (a) Electromagnetic survey

The electromagnetic survey was carried out for Utah Mines Ltd. by Services Exploration Limited, of Noranda, Quebec. An Apex Max-Min II unit was used for the survey.

The Max-Min II EM system consists of a transmitter coil and console which generates an oscillating primary field at one of four operating frequencies (222, 444, 888 or 1777 cycles per second). The choice of frequency is made primarily on the type and depth of overburden and the type, size and depth of target being sought. In general a lower frequency will reduce geological noise, have increased depth penetration, but at the same time reduce the sensitivity of the system.

The transmitter coil of the Apex Max-Min II unit, is connected to a receiving coil and console by a reference cable of suitable length. The choice of cable is made primarily on the basis of depth of exploration. Generally depth of penetration increases with coil separation.

METHOD OF SURVEY (Continued)

The receiving console, once tuned and nulled for local ground conditions gives an automatic read-out of the real and imaginary components of the secondary field, as a percentage of the phase shift of the primary field.

With no conductor present, no secondary field is produced and only the primary field is detected by the receiving coil with a response of zero real and quadrature readings.

In the presence of a conductor, a secondary field is produced when negative real and quadrature readings are recorded. As the leading coil approaches the conductor, positive readings are observed which are known as the positive shoulder. When the coils have moved to a point where the conductor is approximately mid-way between the two coils, a maximum negative response will be observed. As the coils move off the opposite side of the conductor, a second positive shoulder is observed.

The readings obtained are plotted as percentages at the mid-point between the transmitter and receiver coils. The values are then profiled to outline any anomalous regions. The shape of the profiles will depend upon the separation of the coils, the nature of any conductor present, and its physical location as well as the frequency at which the primary field is transmitted.

The depth penetration of this instrument, as already noted is a function of the coil separation and is generally regarded as being  $1/2$  to  $2/3$  of the separation distance.

For this survey the entire grids on both the western and eastern blocks were surveyed using a 600' reference cable. Readings were taken at both 444 Hz and 1777 Hz frequencies.

## METHOD OF SURVEY (Continued)

A standard in-line traverse method was used, where the receiving coil is carried along the picket line followed by the transmitter coil. In this survey readings were taken at 100' intervals along all cross-lines. 557 low frequency readings and an equivalent number of high frequency readings were taken along the grid.

### (b) Magnetometer Survey

The magnetometer survey was carried out by Services Exploration Ltd. under contract to Utah Mines Ltd. An exploranium portable proton magnetometer, Model G-816 was used for the survey.

The accuracy of this instrument is specified as being  $\pm 1$  gamma. The sensitivity is specified as  $\pm 1$  gamma throughout the operating range of the instrument. The instrument is portable and battery operated.

Readings are corrected for diurnal and instrument drift by establishing base stations along the base line.

Magnetometer readings were taken at 100' intervals and at 50' intervals over anomalous areas. A total of 633 readings were taken on the east grid.

After correction, the values are plotted in gammas on a plan map of the grid drawn to a scale of 1":400' and contoured at a 200 gamma interval.

## RESULTS OF EM SURVEY

The results obtained from the EM survey over the north-western and the eastern blocks are shown as a series of profiles on the accompanying HEM survey maps drawn at a scale of 1":400', with a profile scale of 1" to 20%.

RESULTS OF EM SURVEY (Continued)

In the eastern block a relatively strong conductor exists in the south-eastern area of the surveyed grid from Line 56/E to Line 68/E, with the strongest response being observed on Line 68/E at 29+OOS.

RESULTS OF MAGNETOMETER SURVEY

On the eastern grid a narrow magnetic anomaly trends north-westerly from Line 56/E at 32/S to Line 40/E at the base line. This particular anomaly is about 200-400 gammas above background and its geometry suggests that a small diabase dyke cuts across the east-west trending stratigraphy.

CONCLUSIONS

Only one significant conductive EM anomaly was located in this survey. This anomaly is on the eastern grid between Line 56/E and Line 68/E. However this conductor has already been tested by drilling and a graphitic horizon has been intersected.

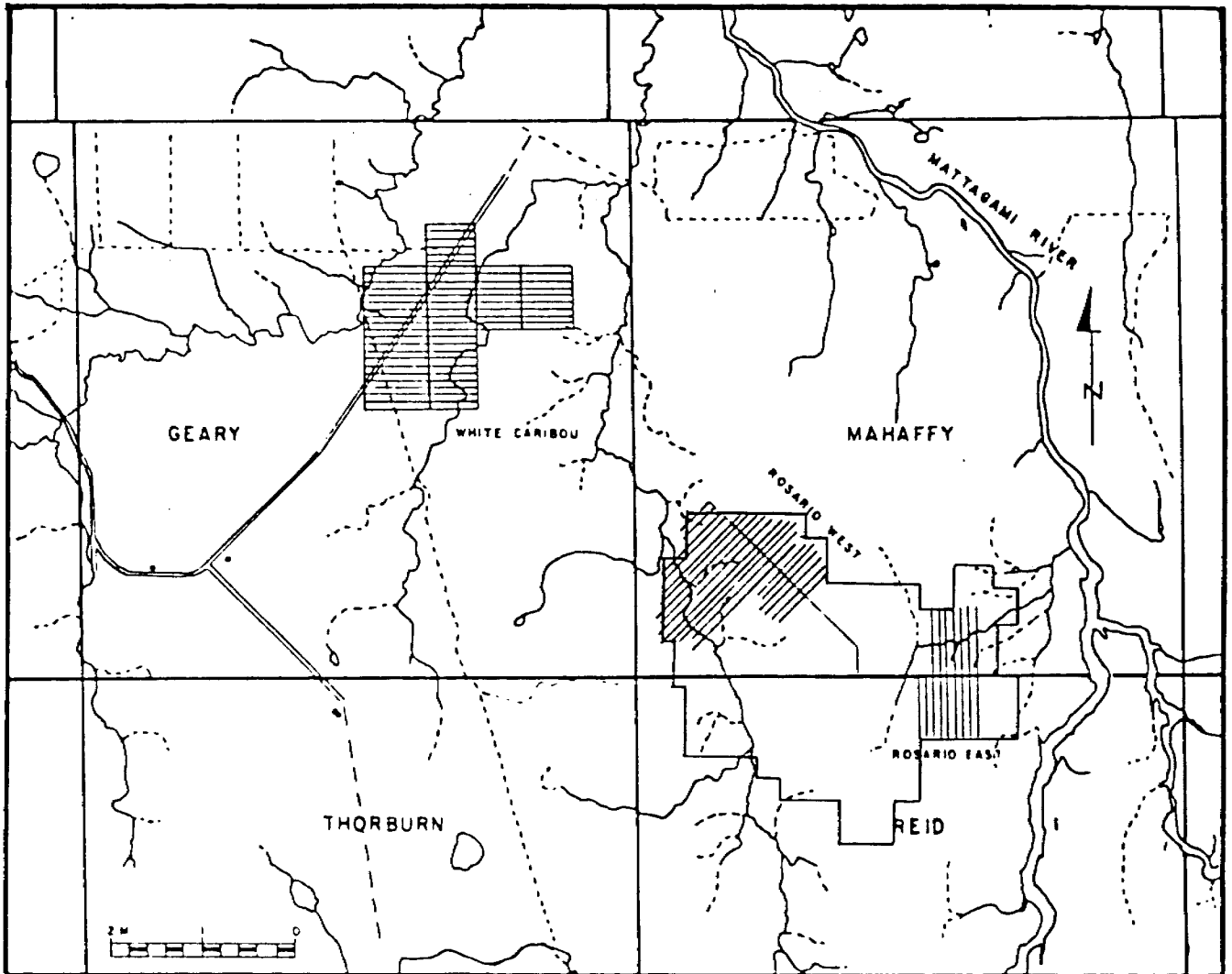
Per

W.S. Mitchell

Respectively submitted

W.S. Mitchell

September 8, 1980



LOCATION PLAN  
OF  
**ROSARIO EAST & WEST**





GEOPHYSICAL TECHNICAL DATA

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

Number of Stations MAG. - 633 EM - 557 Number of Readings MAG. - 633 EM - 557
Station interval MAG - 100 Ft. EM - 100 Ft. Line spacing 400 Ft.
Profile scale 1" to 40%
Contour interval 200 gammas

MAGNETIC

Instrument GEOMETRICS MODEL G-816 PROTON MAGNETOMETER
Accuracy - Scale constant + 1 gamma
Diurnal correction method BASELINE LOOPS
Base Station check-in interval (hours)
Base Station location and value BASELINE L36E - 59510, BASELINE L52E - 59375
BASELINE L68E - 59364

ELECTROMAGNETIC

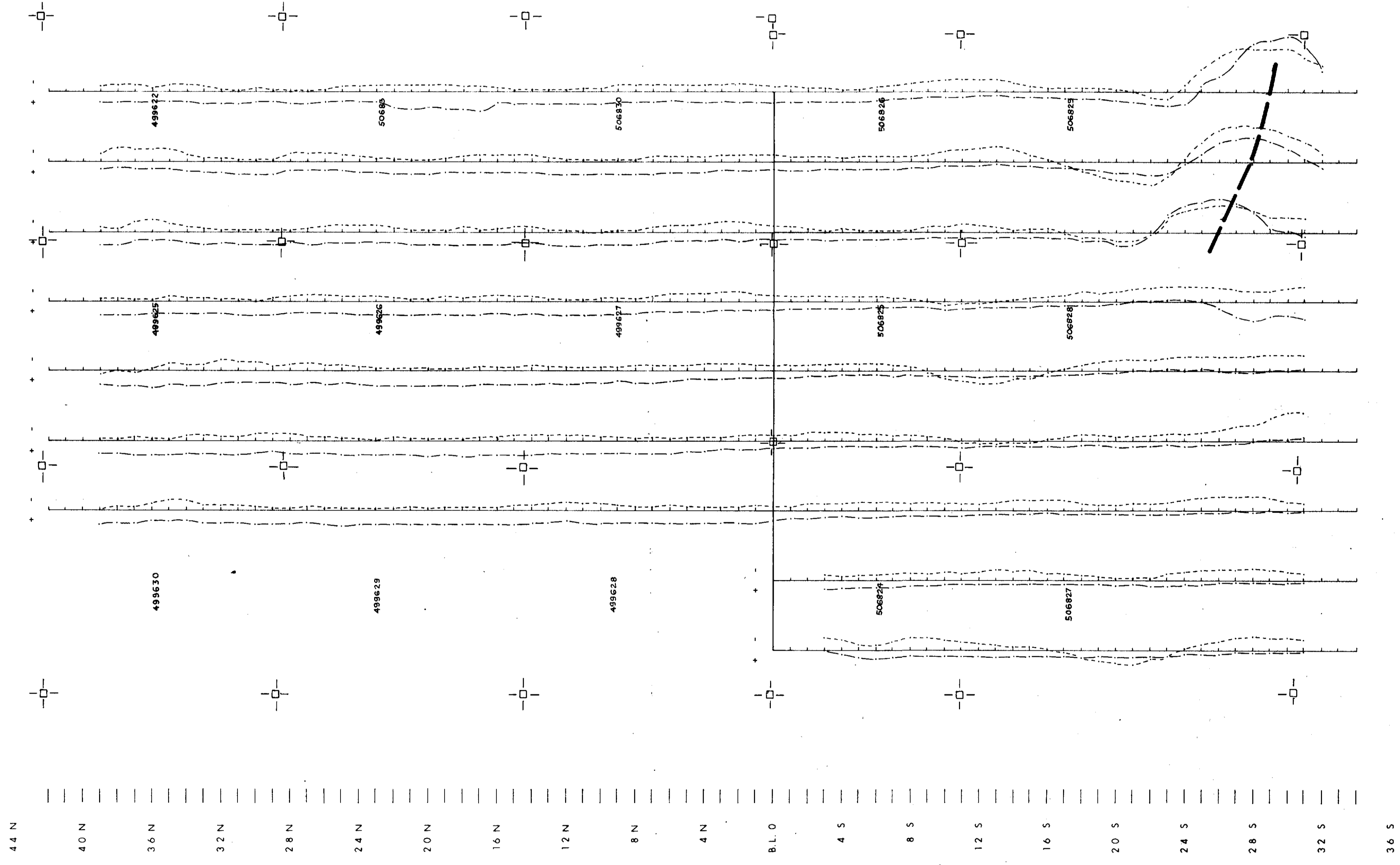
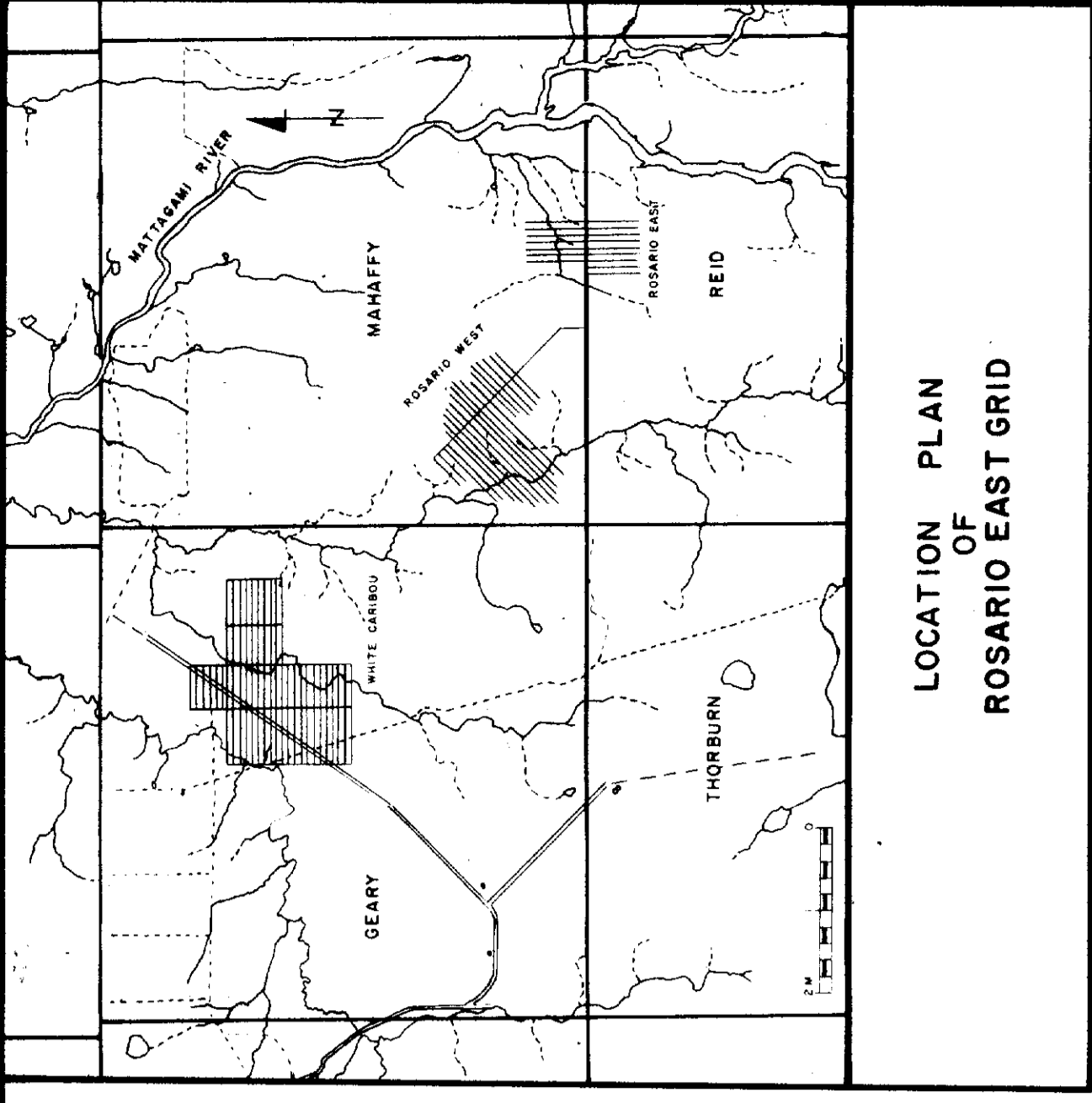
Instrument APEX MAXMIN II
Coil configuration HORIZONTAL LOOP
Coil separation 600 Ft.
Accuracy + 1%
Method: [ ] Fixed transmitter [ ] Shoot back [X] In line [ ] Parallel line
Frequency 444 C.P.S. 1777 C.P.S.
(specify V.L.F. station)
Parameters measured REAL AND QUADRATURE COMPONENTS OF SECONDARY FIELD

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



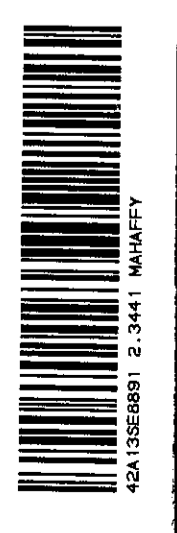
L30E L40E L44E L48E L52E L56E L60E L64E L68E

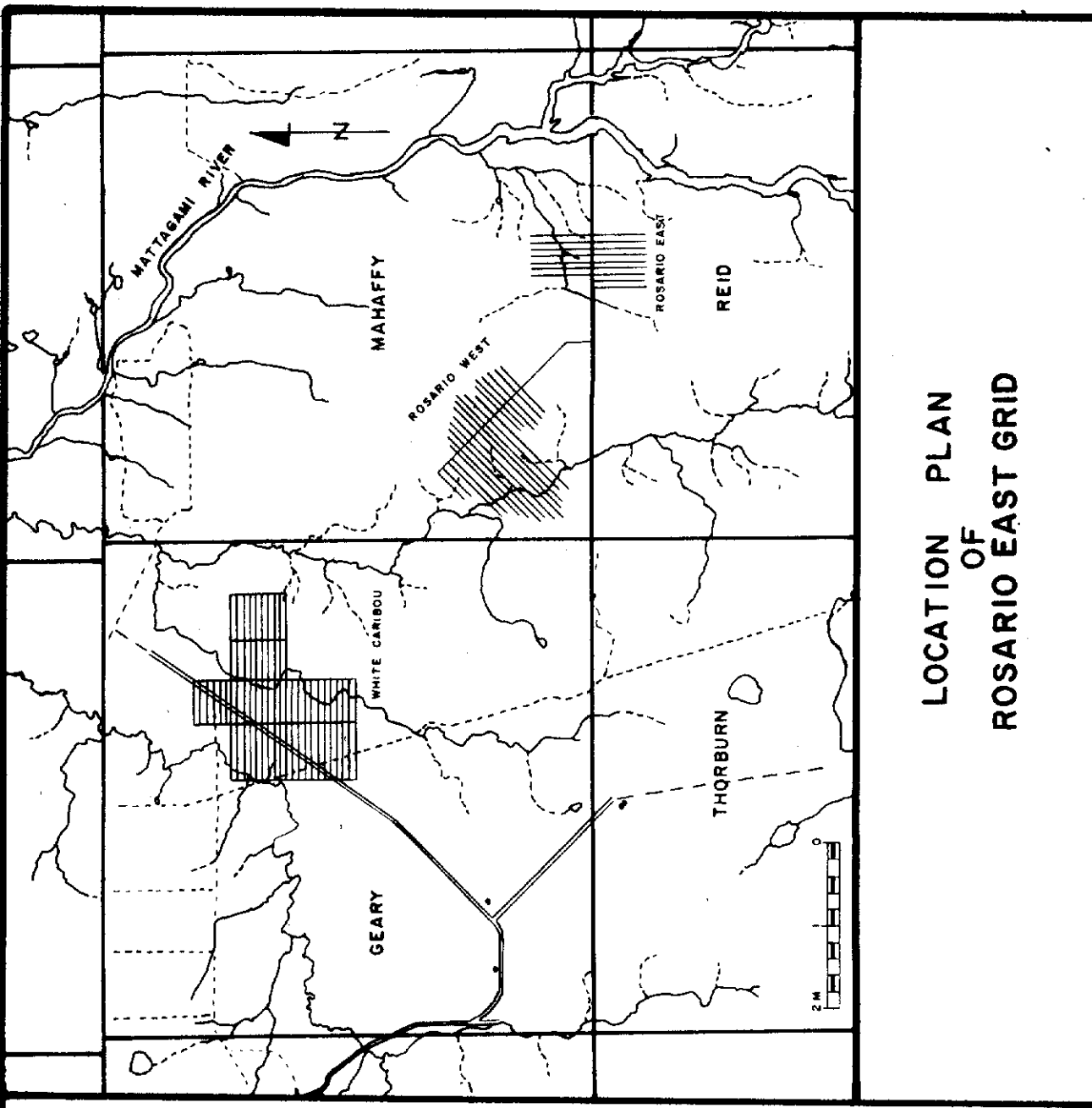
*D.S. Mitchell Jan 19 1987*

**ELECTROMAGNETIC SURVEY**  
FOR  
**UTAH MINES LIMITED**

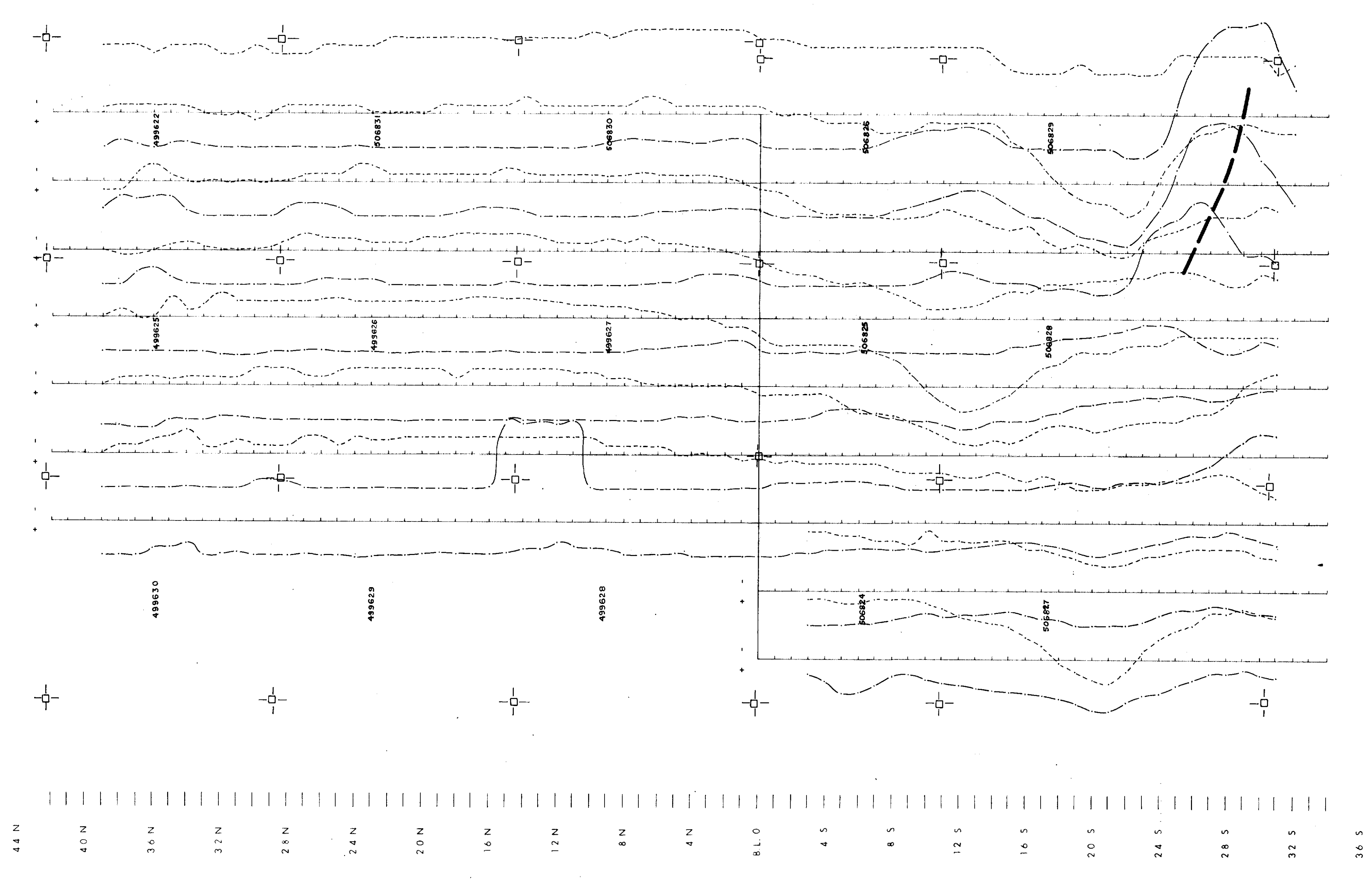
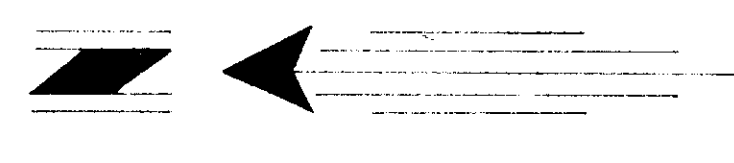
PROJECT: ROSARIO EAST BLOCK  
SURVEYED BY: P.G. R.C. M.L. L.M. DATE: FEB 80  
DRAWN BY: G.C. SCALE: 1" = 400'  
INSTRUMENT: Maxim II ENRG. REGD.  
TWP. RED

Coil Separation 800'  
Frequency 444 Hz  
I.P. 100  
O.P. 40 %  
1" = 40'





LOCATION PLAN  
OF  
ROSARIO EAST GRID

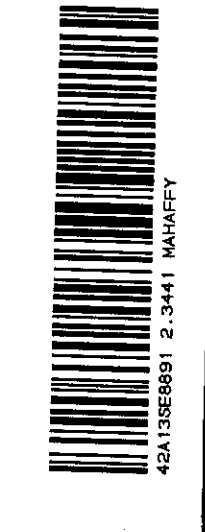


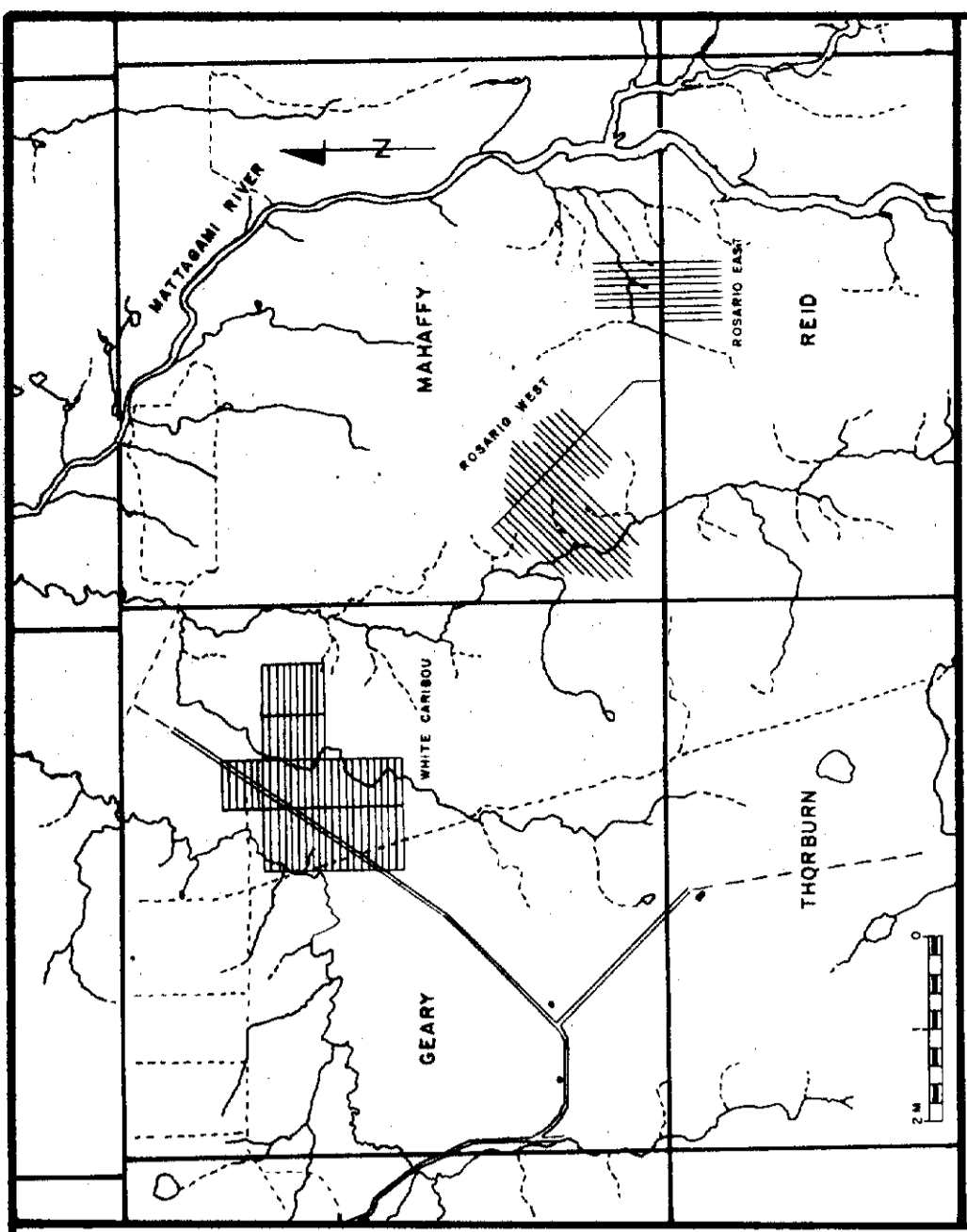
**ELECTROMAGNETIC SURVEY**  
FOR  
**UTAH MINES LIMITED**

PROJECT: ROSARIO EAST BLOCK  
SURVEYED BY: P. G. R. C. M. L. W. DATE: FEB 80  
DRAWN BY: G. C. SCALE: 1" = 400'  
INSTRUMENT: Moaxmin II  
TWP. REID

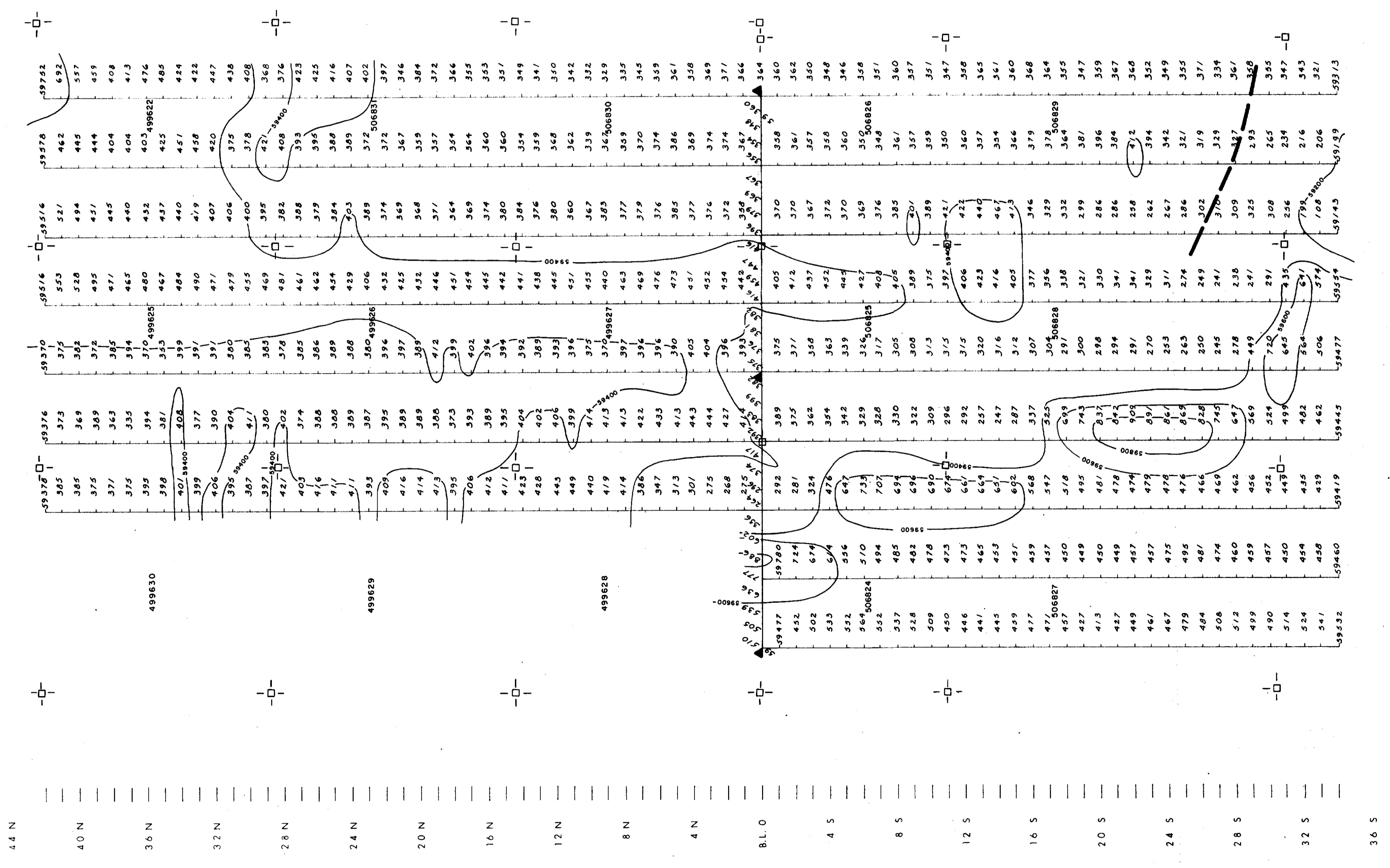
ENGR. REG. D.  
REID

2344





LOCATION PLAN  
ROSARIO EAST GRID



L30E L40E L48E L52E L56E L60E L64E L68E

MAGNETOMETER SURVEY  
FOR  
UTAH MINES LIMITED  
PROJECT: ROSARIO EAST BLOCK  
SURVEYED BY: P.C. S.C. M.L. L.W. DATE: FEB. 80  
DRAWN BY: G.C. SCALE: 1:400  
INSTRUMENT: Geometrics G-86  
SERVICES EXPLORATION SERVICES REGD.  
TWP. REG

