



52E10SW8555 63.3471 SHOAL LAKE

010

EM AND MAGNETOMETER  
SURVEY OF THE MACHIN PROSPECT

SHOAL LAKE, KENORA  
MINING DIVISION, ONTARIO

BY

Z. DOBORZYNSKI  
IMPERIAL OIL LIMITED

AUGUST 2, 1974

Geophysical surveys reported here were carried out over the following claims (Fig. 1) and are held by:

Barbara Machin

Claim MCA 43

Kenora Prospectors and Miners Ltd.

Claims D195, D203, D204, D212 to D217 incl., D228,  
D229, D265, S74, K3055 to K3058 incl.

Imperial Oil Limited

Claims 365026 to 365028, 364991 and 364992

## INTRODUCTION

During March, 1974, ground EM and magnetic surveys were carried out over the Machin property on the Sirdar peninsula. These surveys were intended to trace zones of sulphide mineralization containing pyrrhotite and chalcopyrite. Two mineralized outcrops; one on the south point of the Sirdar peninsula on the baseline and the other on the NE tip of Cedar Island initiated this follow-up work.

## ACCESS AND TOPOGRAPHY

The Sirdar peninsula is located in the Shoal Lake area; about 30 miles southwest of the town of Kenora, in Western Ontario. Access to the area is by air or by road. In the winter this area can be reached by a winter road across Shoal Lake, while in the summer direct access by bush road is possible.

The ground is generally undulating with relief of up to 50' in the southern part of the grid.

## GEOLOGY

The geology of the Machin property has been described by Hasan (1974) as follows. As shown on the ODM map P-528 the ground is underlain by NNE striking fine-grained basalt bands often showing pillow structures. The basalt is interlayered with hornblendite and pyroxenite bearing gabbroic sills which also show a magnetic response. The assumed axis of the anti-

clinal structure runs almost along the base line. One main shear zone appears to run parallel and close to the base line and is mineralized with pyrite, pyrrhotite and chalcopryrite. Numerous cross fractures trending NW occur in the area. These are filled with quartz veins, usually show signs of shearing and often contain appreciable gold with them. There are also NE trending fractures showing the same characteristics. Sulphide mineralization has been examined on the south point of Sirdar Peninsula on the base line and on the NE tip of Cedar Island. The sulphide zone may have some continuity between these two points which remains to be established. A quartz diorite intrusive occurs in the NE part of the grid and also underlies the north east part of Bag Bay.

#### INSTRUMENTS AND PROCEDURES

A) EM INSTRUMENTATION: An ABEM DEMIGUN DMG 251 was used. This system is commonly known as a horizontal loop EM. The DEMIGUN measures the in-phase and out-of-phase (quadrature) components of the electromagnetic field, detected by the receiver. Readings are in percent of the primary field put out by the transmitter, for a selected transmitter-receiver separation.

Measurements were made at a frequency of 2640 Hz with a transmitter-receiver separation of 200 feet. Readings were normally taken at 100 foot intervals and at 50 foot intervals in anomalous areas. The data is presented as profiles in Maps 1 and 3.

B) MAGNETOMETER: A Geometrics G-816 proton precession magnetometer was used. This instrument measures the total magnetic field. It is accurate and stable to  $\pm 1\%$  (gamma) over a range of 20,000 and 90,000  $\mathcal{F}$ 's.

Readings were taken at 100 foot intervals with smaller station spacing in anomalous areas. The data was contoured and is presented in Maps 2 and 4.

### RESULTS

The EM data (Maps 1 and 3) is questionable, as is evident from the erratic nature of the quadrature values, as well as in the lateral displacement of in-phase and quadrature anomalies, particularly in the vicinity of Cedar Island. Consequently quantitative analysis of this data is not feasible. The sole use of this data, then, is to indicate potential anomalies. These are shown in the Maps. The locations of the conductors however, may not be accurate.

The magnetic data (Maps 2 and 4) is more useful, since pyrrhotite is magnetic, and can therefore be used to identify zones of sulphide mineralization. The shear zone, along the baseline, has a limited magnetic expression, extending no further than 800N. There are "EM" anomalies in this area. The few EM anomalies north of this magnetic zone may also reflect

this shear although there are no associated magnetic anomalies. Mineralization may reappear near the shore of Bag Bay, where a magnetic expression is seen north of line 48+00N. This feature is continuous to 76+00N, with associated "EM" anomalies. This zone appears to be faulted at about 62+00N. A second magnetic feature, found between 36+00N and 44+00N at about 15E also has "EM" anomalies near it, making it a potentially favourable zone.

#### RECOMMENDATIONS

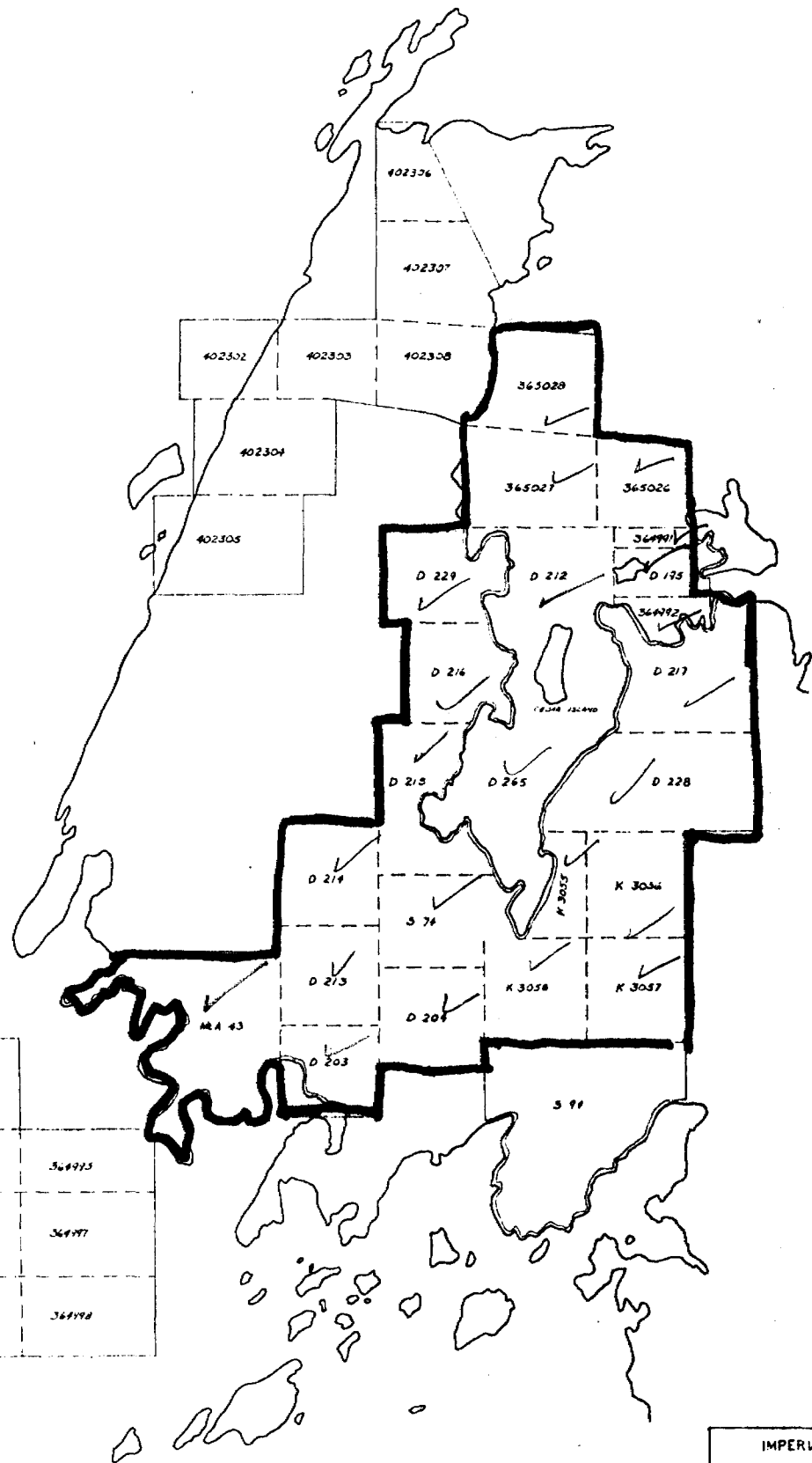
The results tend to confirm the presence of a zone, containing sulphide mineralization, along the baseline, between 0 and 800N. This zone may extend further north, however, the absence of a consistent magnetic trend suggests, at the very least, that the mineralization is deficient in pyrrhotite. A magnetic feature north of 48+00N at about 200E may be similar to the zone between 0 and 800N.

It is proposed that the grid be resurveyed with EM to verify the original EM data. The land portions of the grid should be done this summer. After assessing this data, the remainder of the grid could be completed in the winter if the results warrant it.

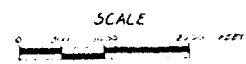
August 1, 1974

*Z. Doborzynski*  
Z. Doborzynski





	364993
	364997
	364998



IMPERIAL OIL LIMITED		
MAP OF CLAIMS IN THE SHOAL LAKE AREA		
DATE: AUG, 1974	MAP NO: 106-1	DRAWN BY: Z.D.
MAP REF: 1570		

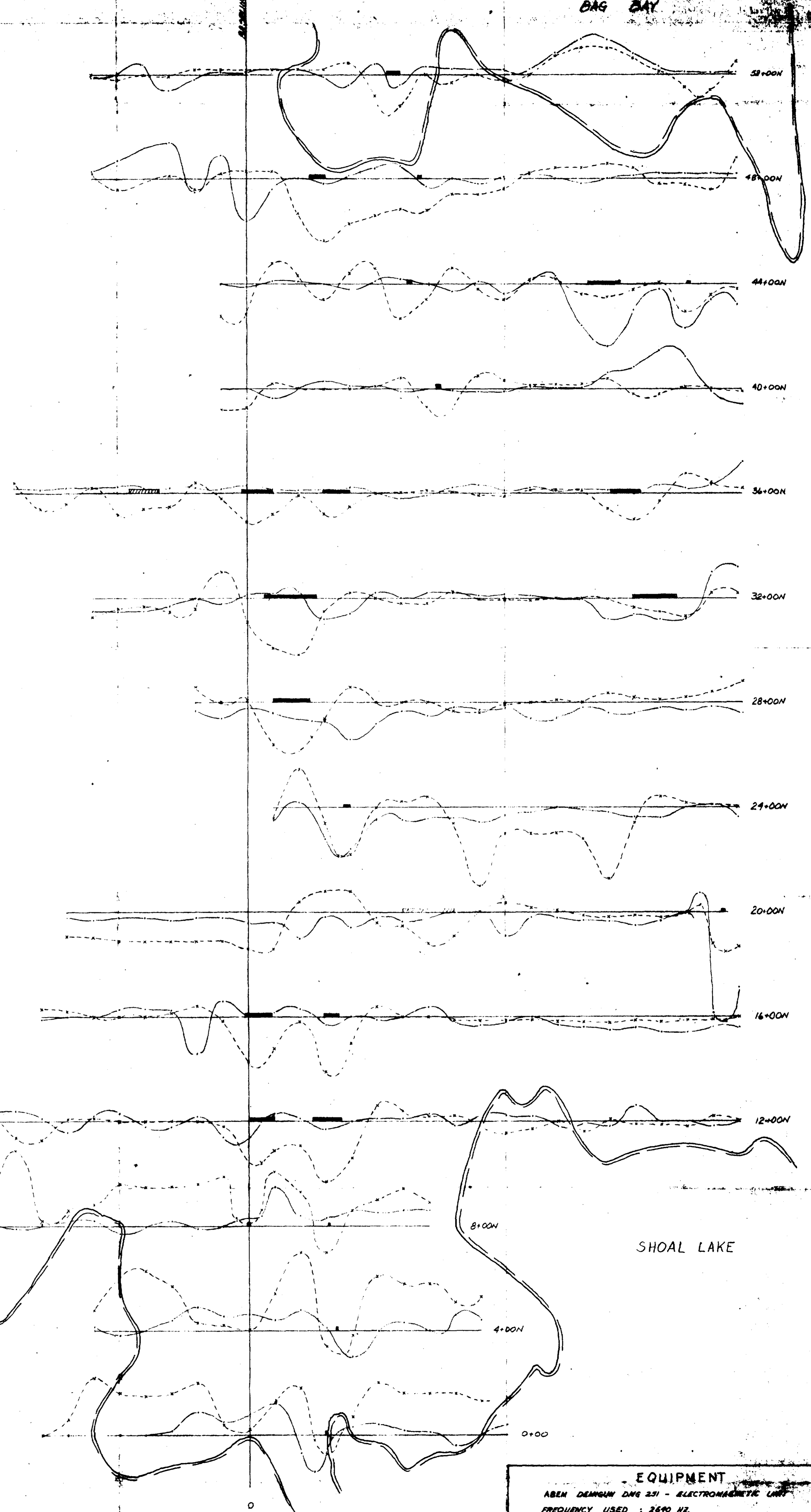


BAG BAY

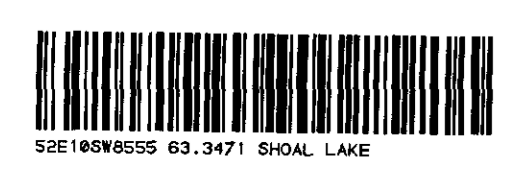
MAGNETIC LEAD (GEM)

SHOAL LAKE

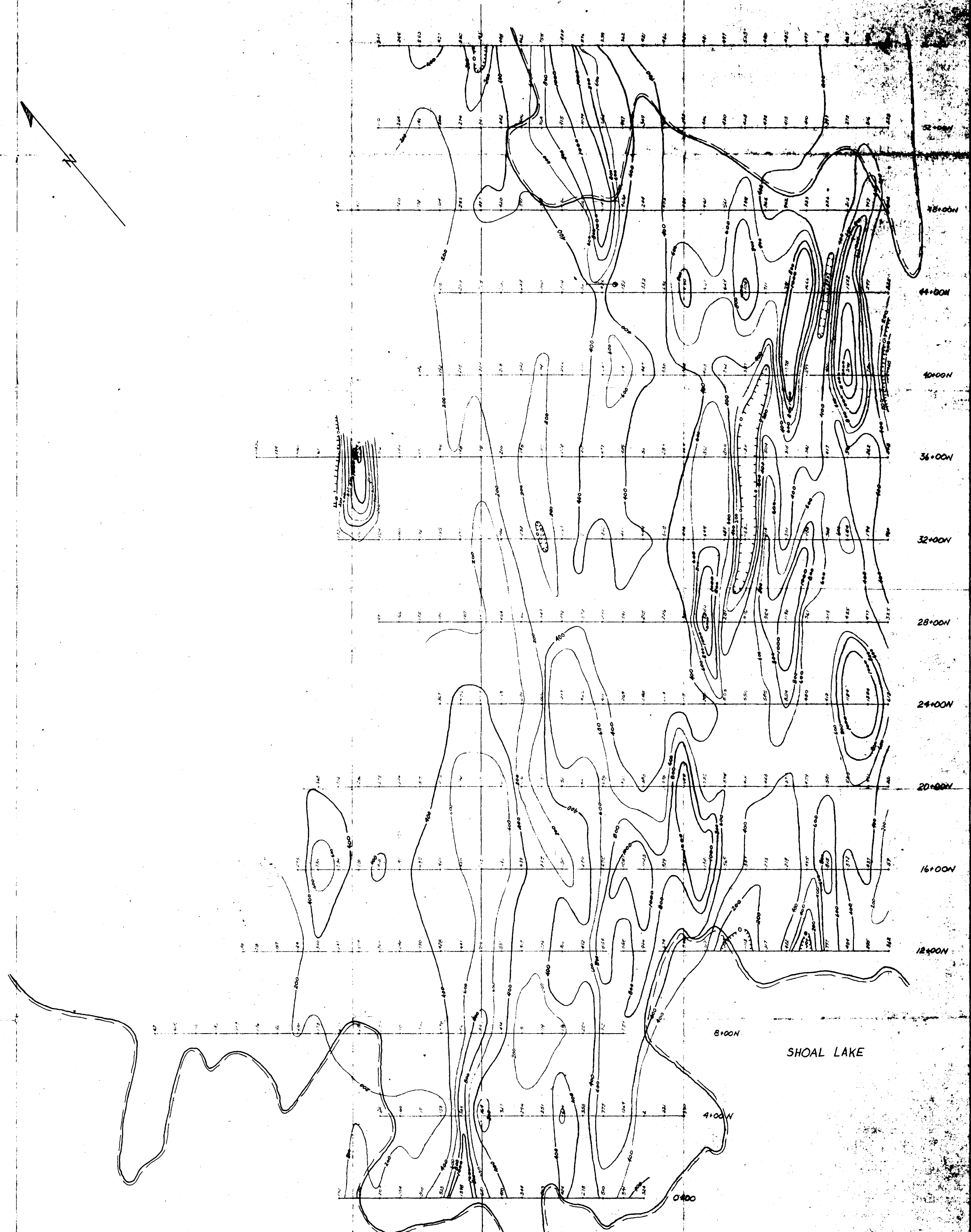
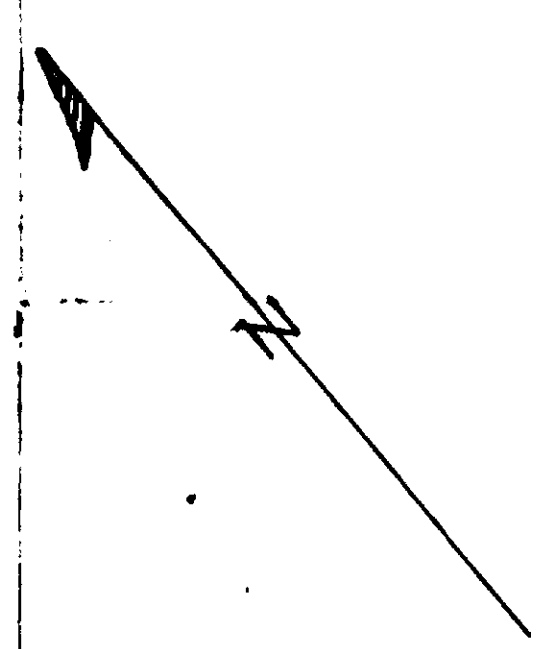
SHOAL LAKE



<b>EQUIPMENT</b>	
ABEM DEMIGUN DMS 251 - ELECTROMAGNETIC UNIT	
FREQUENCY USED : 2690 HZ	
Rx - Tx SEPARATION : 200 FT.	
<b>PROFILES</b>	
—	CONDUCTIVE FEATURE
—	IN PHASE (REAL) COMPONENT
---	OUT OF PHASE (IMAGINARY) COMPONENT
IMPERIAL OIL LIMITED	
<b>ELECTROMAGNETIC SURVEY - NACTIN PROJECT</b>	
DATE : JULY 23 1974	SCALE 1" = 200'
	MAP NO. 3
	MAP REF. 32EY/10

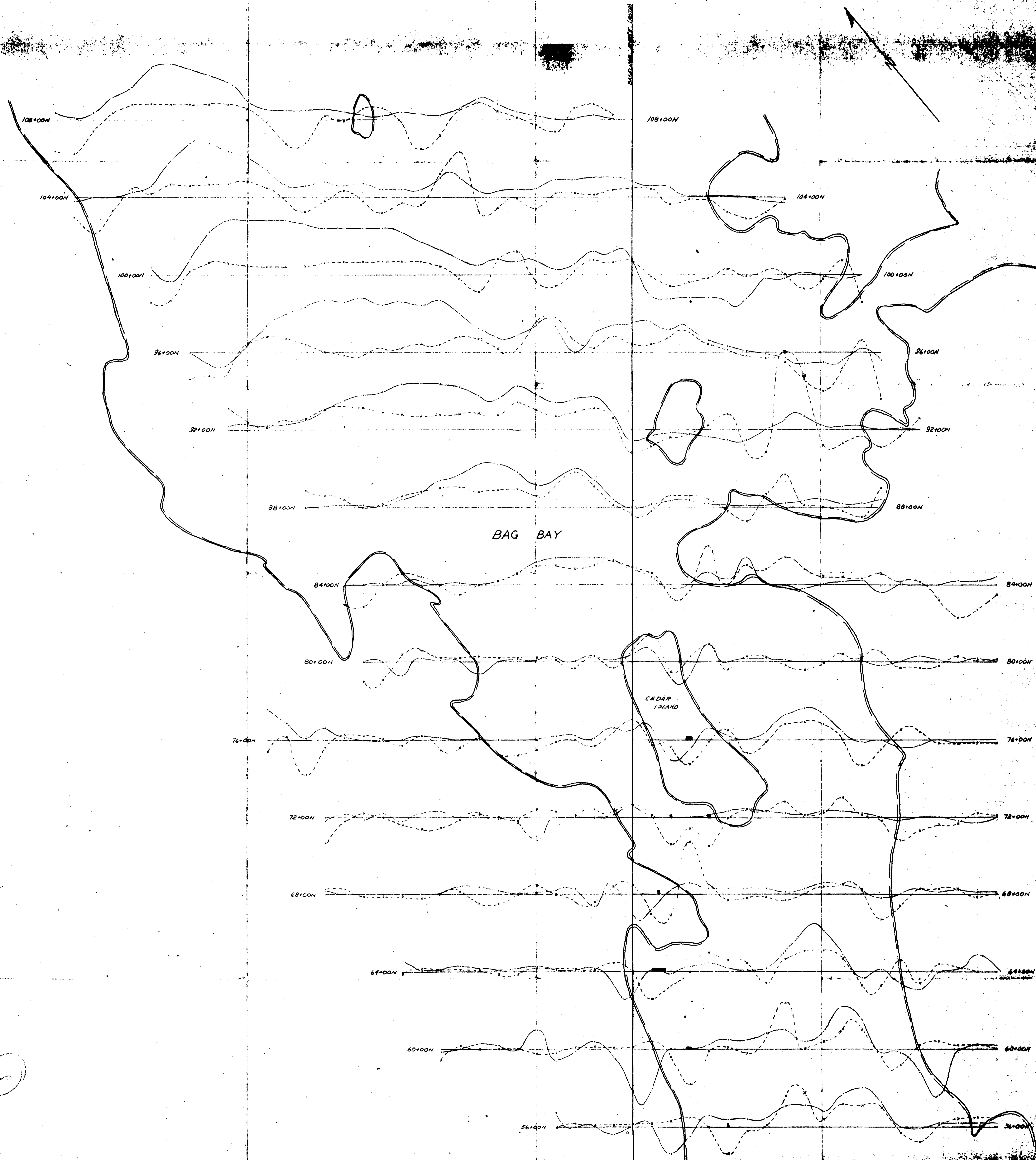


(2)



<b>EQUIPMENT</b>	
PROTON PRECESSION MAGNETOMETER	GEOMETRICS 6814
<b>CONTOURS</b>	
200, 400, 600, 800 (GAMMAS)	
0, 400, 800, 1000, 2000, ... (ft)	
<b>IMPERIAL OIL LIMITED MAGNETIC SURVEY - MACHIN PROJECT</b>	
DATE: JULY 25, 1974	SCALE: 1" = 200'
MAP NO. 2	MAP REF. 32 E/10





**EQUIPMENT**  
 ABEN DRISUM DMR 251 - ELECTROMAGNETIC UNIT  
 FREQUENCY USED: 2640 HZ  
 R.L. TO SURFACE: 200'

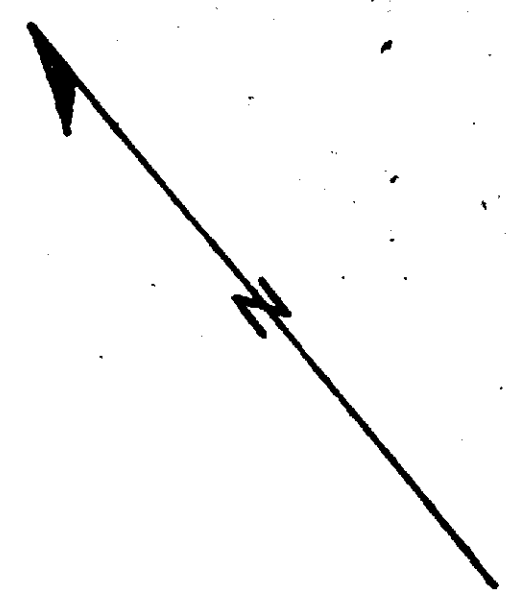
**PROFILES**  
 SCALE 1" = 20'

— IN PHASE (REAL) COMPONENT  
 - - - - - OUT OF PHASE (IMAGINARY) COMPONENT

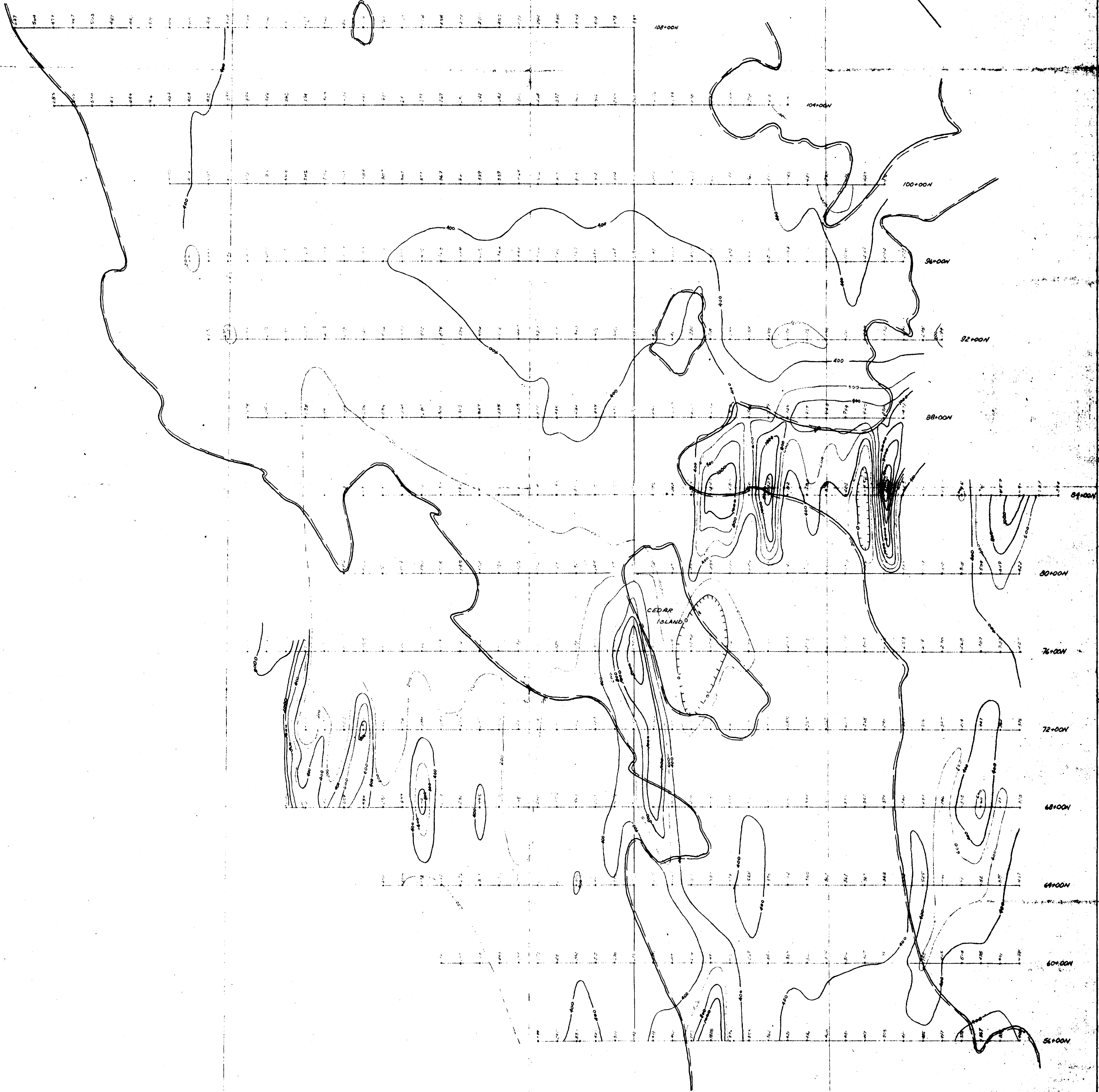
IMPERIAL OIL LIMITED  
 ELECTROMAGNETIC SURVEY - MACHIN PROJECT

DATE: JULY 23, 1974	SCALE 1" = 20'	DRAWN BY: Z.D.
	MAP NO. 3	
	MAP REF. 52-1/10	





BASLINE NAD'S



<b>EQUIPMENT</b>		
PROTON PRECESSION MAGNETOMETER - GEOMETRICS 6.04		
<b>CONTOURS</b>		
	200 / 500 f's (dammed)	
	0, 400 / 800 f's	
	1000, 2000 f's	
<b>IMPERIAL OIL LIMITED</b>		
<b>MAGNETIC SURVEY - BAYVIEW PROJECT</b>		
DATE: MAY 24, 1974	SCALE: 1" = 200'	BY: J. J. ...
MAP NO.: ...		
TRK REF: ...		

