

A GEOPHYSICAL REPORT
ON THE
DOROTHY CLAIMS
OMINECA MINING DIVISION
55° 126° SE

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. **2960** MAP _____

60 MILES NORTHEAST OF SMITHERS, B. C.

FOR

93M/8E

TWIN PEAK MINES LIMITED

AND

DUCANEX RESOURCES LIMITED

BY

R. W. WOOLVERTON, P. ENG.

BETWEEN

FEBRUARY 4 AND FEBRUARY 22, 1971

2960

APRIL, 1971

VANCOUVER, B. C.

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INTRODUCTION

LOCATION

The Dorothy Claims, which make up the Diane Property, are adjacent to the eastern flank of the Bait Range, about 10 miles west of Takla Landing and 65 miles northeast of Smithers, B. C. The claims straddle a previously unnamed small lake which is suitable for any of the float planes currently available at Trans-Provincial Air Services' base at Tyhee Lake, southeast of Smithers. Also, the B. C. Forest Service cleared a heliport on the southwest shore of Diane Lake 2 or 3 years ago. Maximum relief on the property is only 200'. However, the undergrowth is extremely thick and Devil's Club is abundant. Only balsam and hemlock were noted by the writer. There are a few swampy areas especially where the beaver have restricted the outlet of the lake.

AIM OF PROGRAM

Early in 1970, the Government released a series of aeromagnetic maps of a large section of country north of Babine Lake. A small but very intense magnetic high was noted on these maps and the Diane property was staked. The writer was unable to find any exposure during a traverse of the anomalous area during the summer of 1970; however, some angular rhyolite and rhyolite porphyry float was noted.

A camp was established on the ice at Diane Lake in early February, 1971, and about 12 line miles of winter grid was cut and flagged. This grid was surveyed with a Fluxgate magnetometer and a VLF (Radem) EM. The results of this work are the subject of this report. The field work was contracted to P. F. Bland of Smithers, an experienced exploration field man, and the maps were compiled by Versatile Drafting Ltd. of Smithers, B. C. The writer supervised the field work and interpreted the results.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT #3
NO. 2960 MAP

			264	262	260	258	256	254	
			263	261	259	257	255	253	
		L 48 N	327	326	325	324	323	322	321
		L 40 N	329	252	249	247	245	243	241
			328	251	250	248	246	244	242
296	294	292	290	240	238	236	234	232	230
295	293	291	289	239	237	235	233	231	229
			288	286	284	282	280	278	
			287	285	283	281	279	277	

DOROTHY CLAIMS

Beaverdale Creek

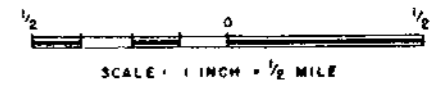
B. L.



KEY MAP
BRITISH COLUMBIA



TWIN PEAK MINES LTD.
GRID LOCATION
AND
CLAIMS MAP
DIANE PROPERTY
DOROTHY CLAIMS
OMINECA M.D. BRITISH COLUMBIA



PREPARED BY
VERSATILE DRAFTING LTD.

GEOPHYSICS

MAGNETOMETER SURVEY

EQUIPMENT AND SURVEY

Readings were taken every 200' along the grid lines, which are 400' apart, using a "Sabre" Fluxgate Magnetometer. This instrument is manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B. C. A magnetic base line was established by making a series of 400' closed traverses along the base line and correcting each short traverse for any diurnal variation. The base line was started by reading 0 N, 2 N, 4 N, and 0 N again on the base line. Using the first reading at 0 N as the base, the traverse was corrected by using the difference between the second and first reading at 0 N as a correction distributed over the 4 N and 2 N readings on a time basis. The second traverse was 4 N, 6 N, 8 N, 4 N and was similarly corrected. When the base line was established, the operator could start at any point on the base line and tie in at any of the other base line stations. Thus, the field readings are more frequently tied into a base than would be the case if a base station was read at camp morning and night as is usually the case.

The magnetic observations taken during the survey are plotted on Map #1 and are included in the pocket of this report. The map is drawn at 1" = 400' and the magnetic data is contoured at 200 gamma intervals.

RESULTS

A 5,000 gamma anomaly was located fairly close to where the Government aeromagnetic sheet indicated a magnetic high. A second high may be developing to the northwest as indicated by the high readings on the most northerly line although the Government map (see Page 1B) does not show a continuation of the anomaly.

Although the magnetic high appears discreet on the aeromagnetic sheet, the ground survey suggests that it may be longer than shown on the map. If this is so, the cause of the anomaly is probably a basic intrusive or some other highly magnetic geological unit; however, the possibility also exists that the anomaly is due to magnetite in a contact metamorphic environment. In fact, the sharp drop-off in values to the northeast of the magnetic high suggests a contact.

RADEM SURVEY

EQUIPMENT AND SURVEY

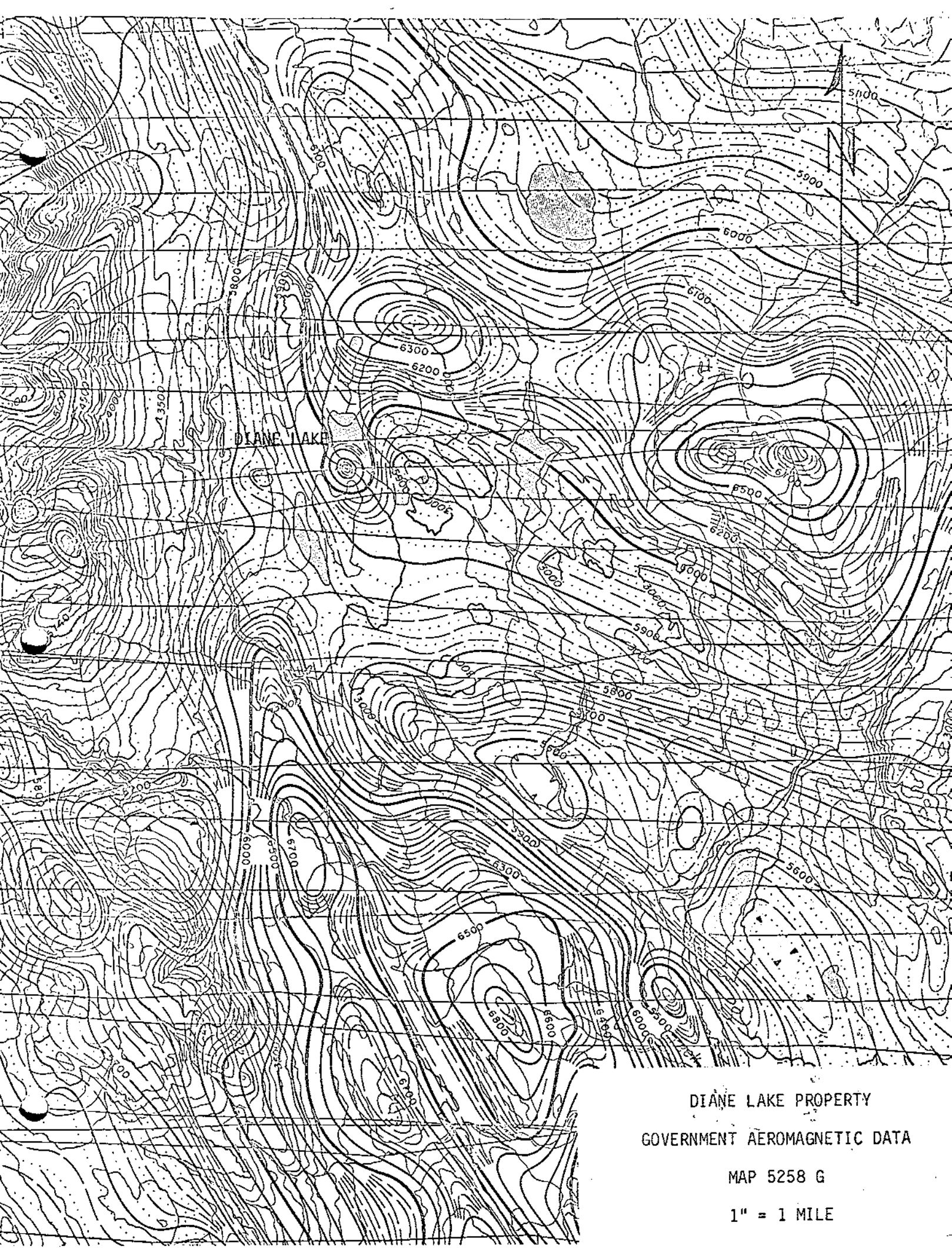
The Radem unit used in the survey is a 1-man EM radio receiver utilizing the 12 to 24 kilocycle United States Naval Communication Broadcast Stations. It was built by Crone Geophysics Limited, 3607 Wolfedale Road, Mississauga, Ontario. The instrument utilizes higher than normal EM frequencies and is capable of detecting disseminated sulfides; however, due to the high frequency, it is affected by clay and other conductive overburden. Some type curves and specifications are included as Appendix I of this report.

In-phase (dip angle) readings were taken using the Seattle, Washington, station (18.6 kc). The results are plotted on Map #2 accompanying this report.

RESULTS

The EM profiles indicate cover in excess of 50' over most of the grid except in the immediate vicinity of the most intense part of the magnetic anomaly. The cover appears to be somewhat conductive under the lake around 16 N between 2 E and 10E. Conductive overburden is also indicated east of the lake on Line 24 N between 14 E and 20 E and on Line 28 N between 12 E and 24 E.

Four very weak crossovers occur on Line 36 N at 24 W, Line 24 N at 26 W, Line 16 N at 2 E, and on Line 12 N at 18 W. The crossover on Line 16 N is probably an edge effect of the conductive cover under the lake to the east. The other three weak crossovers are all within the mag high zone. These crossovers can be due either to zones of weak conductivity within a contact metasomatic environment or they may simply reflect the contact between a highly magnetic (for instance, a basic intrusive) geologic unit and the country rock.



DIANE LAKE

DIANE LAKE PROPERTY
GOVERNMENT AEROMAGNETIC DATA
MAP 5258 G
1" = 1 MILE

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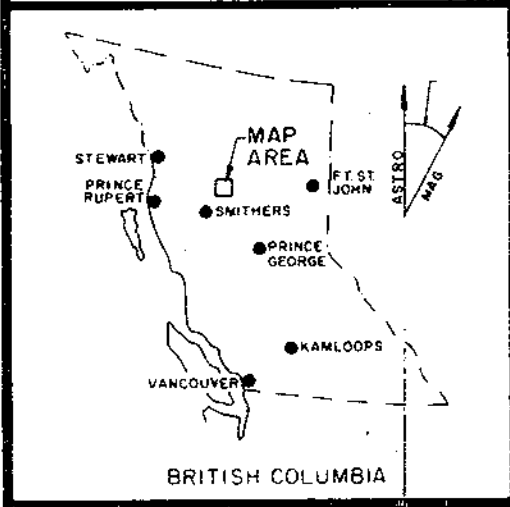
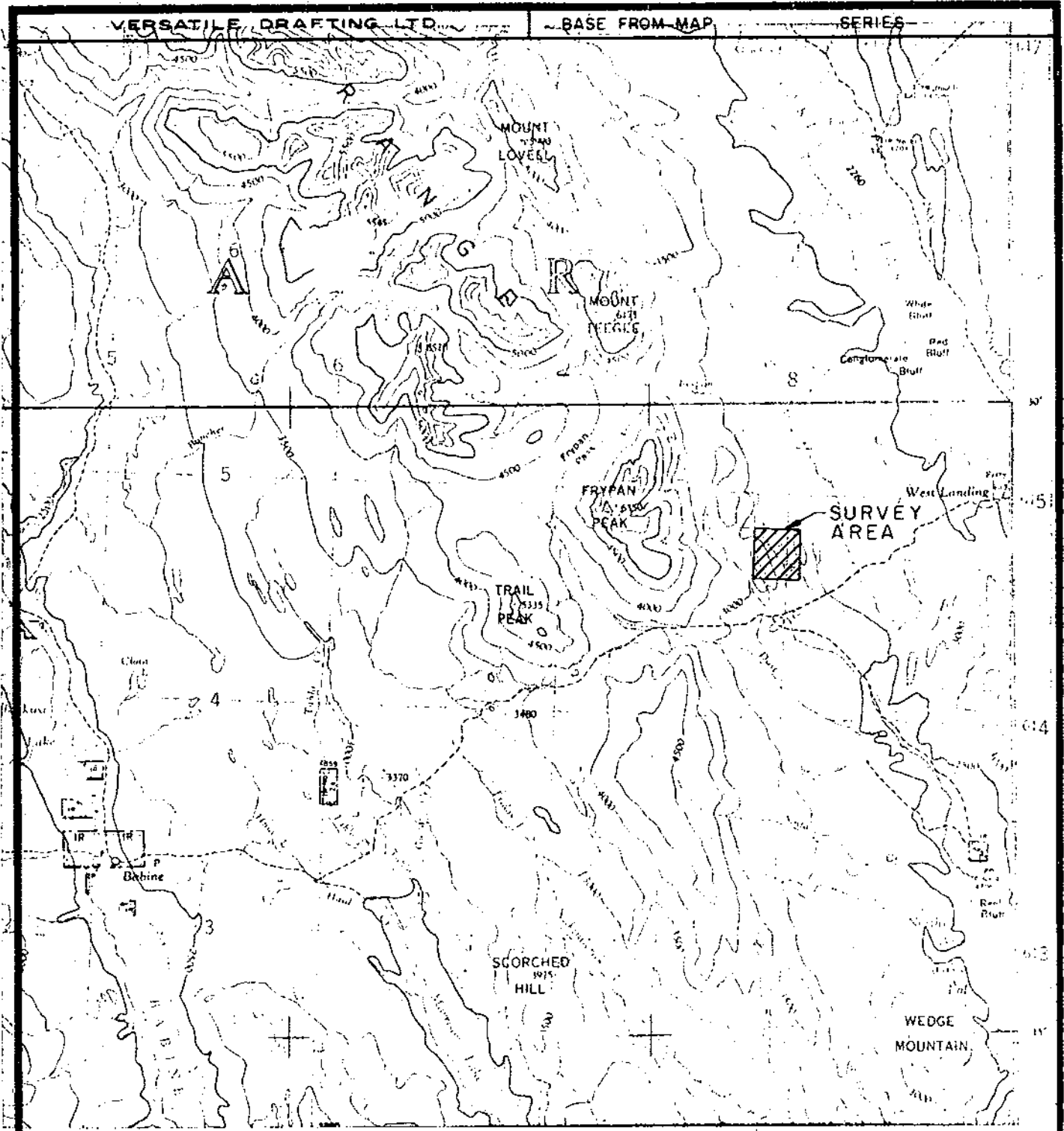
MAP

#2

C

C

C



TWIN PEAK MINES LTD.

LOCATION MAP DIANE PROPERTY DOROTHY CLAIMS

OMINECA M.D.

BRITISH COLUMBIA



MARCH, 1971

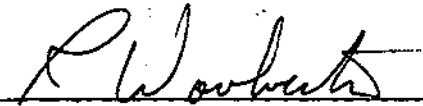
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2960 MAP #1

SUMMARY OF EXPENSES

Trans-Provincial Airlines Ltd. - February 1	\$ 98.00
February 4	156.00
February 15	24.00
February 22	156.00
P. F. Bland - as per contract	1,660.00
Drafting and Report Preparation	<u>500.00</u>
TOTAL	<u>\$2,594.00</u>

DECLARATION OF PROJECT CHARGES

The undersigned considers the preceding invoices applicable
as assessment work.


R.W. WOOLVERTON, P. ENG.

Trans-Provincial Airlines Ltd.

Flt. Report Number 641	CHARTER AND CONTRACT TICKET	Invoice Number
----------------------------------	------------------------------------	----------------

Charge to: EVERGREEN EXPLORATIONS

Date	Cash	Phone
A/C Type OTTER	CF- KAC	Warrant or Reg. No.
Base MCHURE	Pilot W. LAPASCHUK	
From MCHURE	To (1) DIANE	
To (2) MCHURE	To (3)	
To (4)	To (5)	

FARE	130	Miles @ \$ 1.20			\$ 156.00
Contract Rate					
Waiting Time					
Extra Landings					
Pilot Expenses					
Other					
TOTAL CHARGES					\$ 156.00

THIS TICKET IS EXPRESSLY SUBJECT TO THE CONDITIONS PRINTED ON THE REVERSE SIDE OF TICKET AND WHICH ARE HEREBY ACCEPTED: (PASSENGERS' SIGNATURES)

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

Debbie (Dan)

No 15998

Trans-Provincial Airlines Ltd.

Flt. Report
Number

CHARTER AND CONTRACT TICKET

Invoice
Number

Charge to: EVERGREEN EXP. LK

Date <u>FEB 15</u>	Cash	Phone
A/C Type <u>C-185</u>	CF- <u>YYM</u>	Warrant or Reg. No.
Base <u>MILURE</u>	Pilot <u>CAMERON</u>	

From: HAUTE TE To (1) DIANE LK
 To (2) HAUTE TE To (3) _____
 To (4) _____ To (5) _____

FARE <u>40</u>	Miles @ \$ <u>.60</u>	\$ <u>24.00</u>
	Hours @ \$ _____	
Contract Rate		
Waiting Time		
Extra Landings		
Pilot Expenses		
Other		
TOTAL CHARGES		\$ <u>24.00</u>

Authorized By R. Wood

THIS TICKET IS EXPRESSLY SUBJECT TO THE CONDITIONS PRINTED ON THE REVERSE SIDE OF TICKET AND WHICH ARE HEREBY ACCEPTED: (PASSENGERS' SIGNATURES)

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

No 16060

Trans-Provincial Airlines Ltd.

Flt. Report Number 187	CHARTER AND CONTRACT TICKET	Invoice Number
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Charge to: **EVERGREEN EXPLORATIONS**

Date FEB 4/70	Cash	Phone
A/C Type OTTER	CF- XUY	Warrant or Reg. No.
Base MCHURF	Pilot W. LAPASITUK	

Fr. **MC** To (1) **DIANE HK**
 To (2) **MC** To (3) **MC**
 To (4) To (5)

FARE 130	Miles @ \$ 120	\$ 156.00
Contract Rate	Hours @ \$	
Waiting Time	@ \$	
Extra Landings	@ \$	
Pilot Expenses		
Other		
TOTAL CHARGES		\$ 156.00

Au. sized By

THIS TICKET IS EXPRESSLY SUBJECT TO THE CONDITIONS PRINTED ON THE REVERSE SIDE OF TICKET AND WHICH ARE HEREBY ACCEPTED: (PASSENGERS' SIGNATURES)

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

No 15980

Babine

Trans-Provincial Airlines Ltd.

Flt. Report Number	CHARTER AND CONTRACT TICKET	Invoice Number
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Charge to: **EVERGREEN EXPLORATIONS**

Date 1/2/71	Cash	Phone
A/C Type 185	CF- YHM	Warrant or Reg. No.
Base MCHURF	Pilot BIMMONS	

Fr. **MCHURF** To (1) **DIANE HK**
 To (2) **MCHURF** To (3) **MC**
 To (4) To (5)

FARE 130	Miles @ \$ 60	\$ 98.00
Contract Rate	Hours @ \$	
Waiting Time	@ \$	
Extra Landings	@ \$	
Pilot Expenses		
Other		
TOTAL CHARGES		\$ 98.00

Au. sized By **Phone "Union Western"**

THIS TICKET IS EXPRESSLY SUBJECT TO THE CONDITIONS PRINTED ON THE REVERSE SIDE OF TICKET AND WHICH ARE HEREBY ACCEPTED: (PASSENGERS' SIGNATURES)

1	CHECK ICE	7
2	ON DIANE HK	
3		9
4	18" ice	10
5	18" snow	11
6		12

No 16028

CONCLUSIONS AND RECOMMENDATIONS

Both the ground mag and ground EM surveys at Diane Lake suggest that the airborne mag high located by the Government flying could be caused by either:

- (a) a highly magnetic rock unit such as a basic intrusive; or
- (b) magnetite within a contact metasomatic environment.

If the mag high does reflect contact metasomatism, the presence of sulfides could easily be determined by an induced polarization survey. Initially Lines 12 N, 24 N, and 36 N should be run from the shore of Diane Lake westwards. Soil samples should also be collected and initially tested for total copper.

Respectfully submitted,



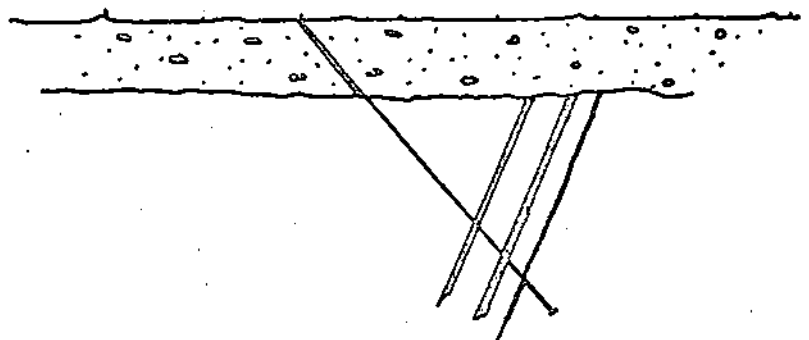
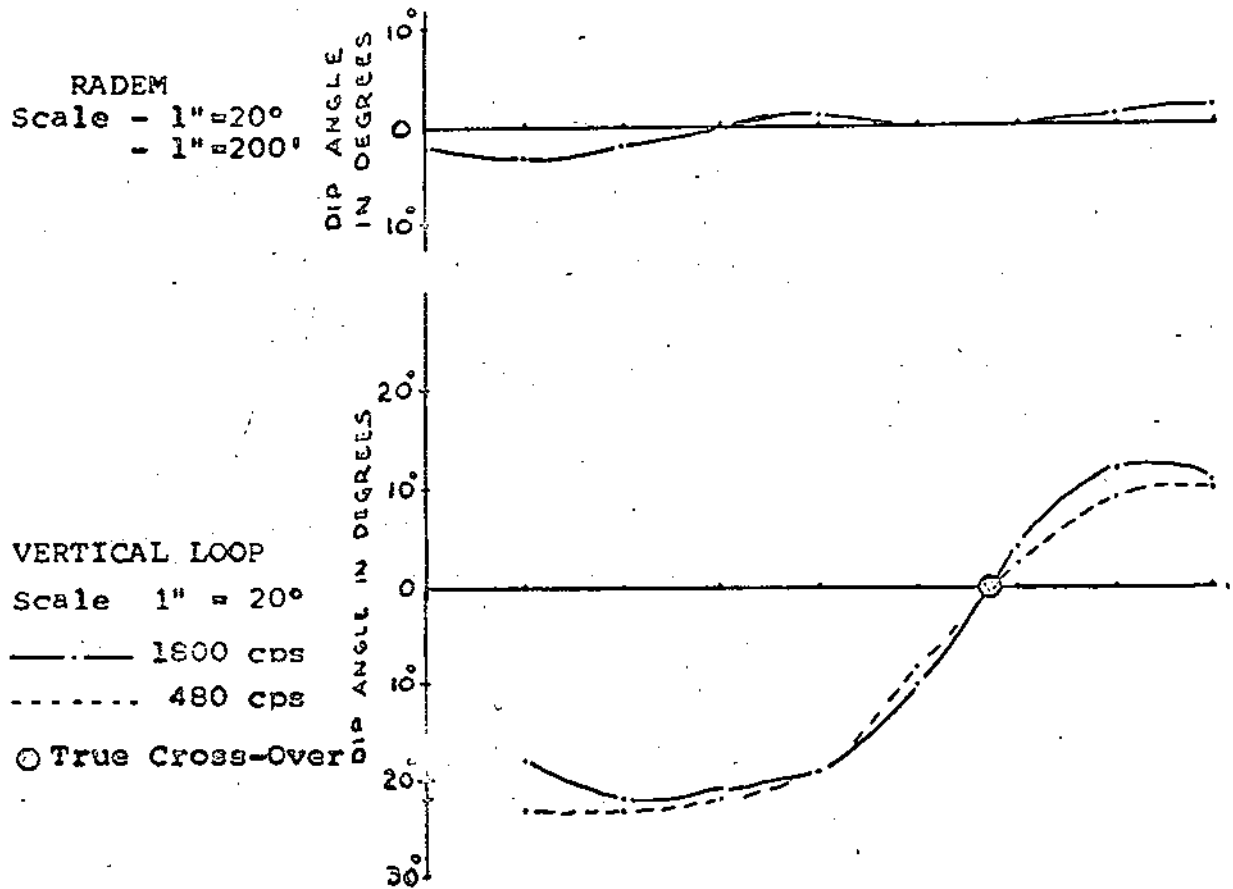
R. W. WOOLVERTON, P. ENG.


APPENDIX II

DECLARATION OF EXPENDITURES

CASE HISTORY # 1

RADEM AND DUAL FREQUENCY VERTICAL LOOP TRAVERSES OVER AN EXCELLENT CONDUCTOR BURIED AT MODERATE DEPTH (75'), TULLY TOWNSHIP, TIMMINS, ONTARIO.



 Graphitic conductor with 10% pyrite

Depth of overburden = 75'

Overburden extends for at least one mile in all directions

CASE HISTORY # 1

RADEM PROFILES OVER CANADIAN JAMIESON MINE, TIMMINS, ONTARIO.

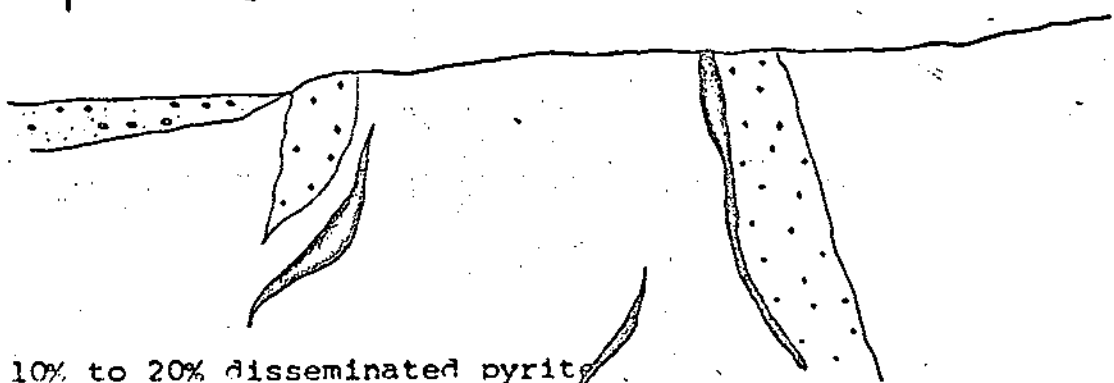
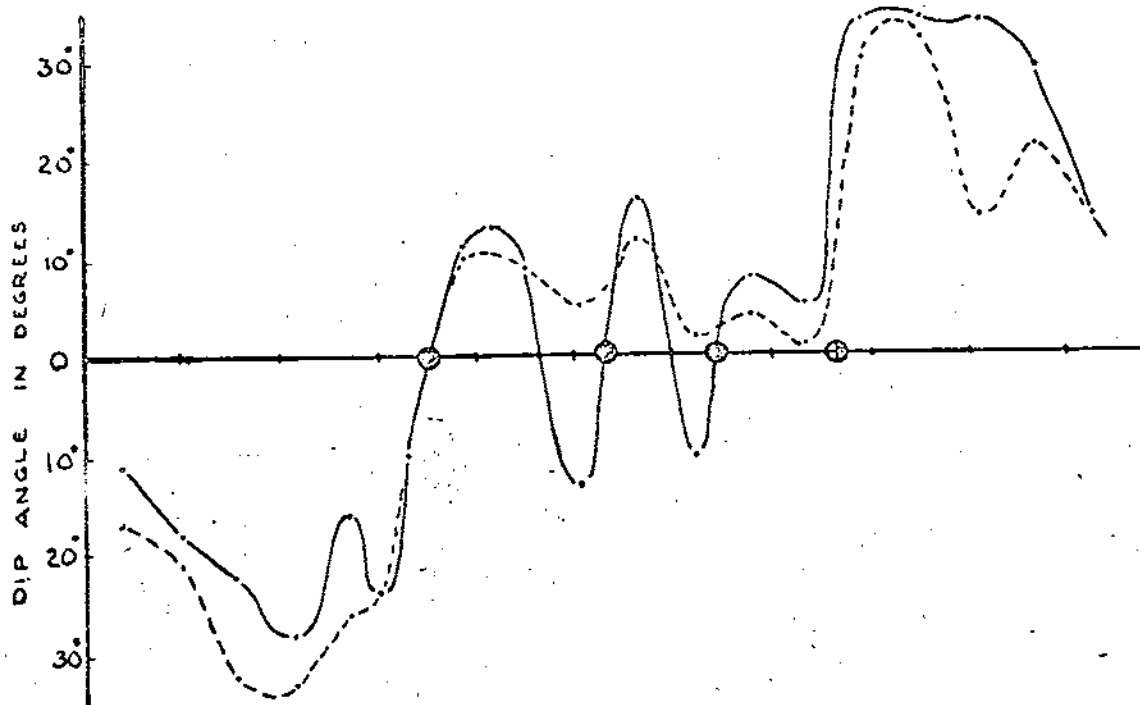
Scale 1" = 20°; 1" = 200'

— Annapolis 21.4 kcs

- - - - Panama 24.0 kcs

⊙ True Cross-Over

⊕ Indicated Cross-Over



10% to 20% disseminated pyrite



Massive Sulphides

Sizes of ore lenses - 105,000, 135,000 and 280,000 tons

Only one of the ore lenses outcrops

Overburden is shallow over mineralized area.

CRONE GEOPHYSICS LIMITED

979 LAKESHORE ROAD E.
PORT CREDIT, ONTARIO

TELEPHONE 274-3704

CASE HISTORY # 1

March 1, 1968

Two Radem (VLF Radio EM) Traverses in the Timmins Area, Ontario.

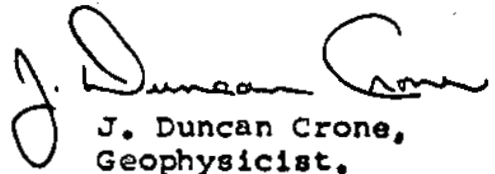
The use of the VLF radio transmitters as an EM primary field source is not new, but rather one of the oldest and earliest (1929) EM methods. The recent revival of this method is due to the greatly increased power and reliability of the transmitter stations. The method still has, however, its original advantages and limitations. If used properly it can be very effective; if pushed beyond its basic limitations disappointing results will be obtained. The following two profiles illustrate this point.

The first profile, over the Canadian Jamieson Mine near Timmins, illustrates the ability of the method to detect the three in echelon ore bodies. This is rather remarkable from three aspects: 1) no other EM method (horizontal loop, vertical loop - fixed and broadside, or JEM) was capable of detecting even one of these ore lenses; 2) the traverse crossed the yard of a producing mine, thus operating in an area of high hydro noise; 3) the dip angles obtained were very large, $+30^{\circ}$ to -30° .

The ore lenses are excellent conductors, but were not detected by previous EM surveys, due to their being discontinuous and of limited size.

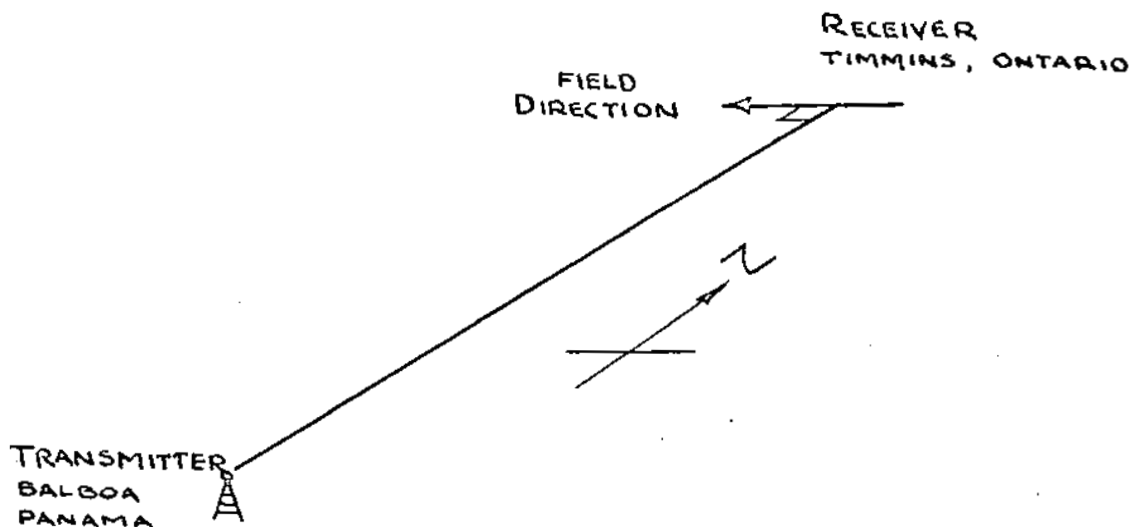
The second profile, also from the Timmins area, is a traverse over a strong conductor buried below 75 ft. of clay and sand overburden. The RADEM profile fails to detect the conductor which is clearly outlined by the dual frequency vertical loop survey. (Note: The ratio of low frequency, 480 cps, to high frequency, 1800 cps, is unity.) This illustrates the inability of the VLF - EM method to penetrate the overburden. The VLF - EM method will produce large tilt angles from the clay bed itself. These large angles will occur towards the edge of the clay bed and thus complicate interpretation in these areas.

Conclusion: The VLF - EM method is a highly effective and rapid reconnaissance tool. It is limited by its high frequency and the inability to interpret from the results the conductivity and shape of the conductor. Until more experience is gained, this method should be used in shallow (less than 30 ft.) overburden areas.


J. Duncan Crone,
Geophysicist.

The direction of the magnetic component of the field from a VLF station is horizontal and perpendicular to the line between the operator and the transmitting station (see Figure 4). In this example

FIGURE 4.



the receiver at Timmins, Canada, is using the Panama Station that is due south of Timmins. The normal field direction in this case will be horizontal in an east-west direction. This field would couple with a north-south striking conductor. Thus for maximum coupling and therefore best results select a transmitter station located in the same direction as the geological strike. With the Timmins, Ontario, example Panama should be used in areas of north-south geological strike and Seattle Washington in areas of east-west strike. If the geological strike is not known then it is best to read two stations that are located in directions perpendicular to each other.

The U.S. naval VLF stations are shut down for periods of 4 to 8 hours every week for routine maintenance. This shutdown schedule is published by the U.S. Navy and is forwarded to RADEM users by Crone Geophysics.

OPERATION OF THE RADEM RECEIVER:

- Turn the unit ON by means of the ON-OFF switch. This can be left on all day since the battery drain is very low.
- Turn the station selector switch to the station you wish to use.
- Adjust the volume control knob such that the signal can be clearly heard.

FIGURE 2.

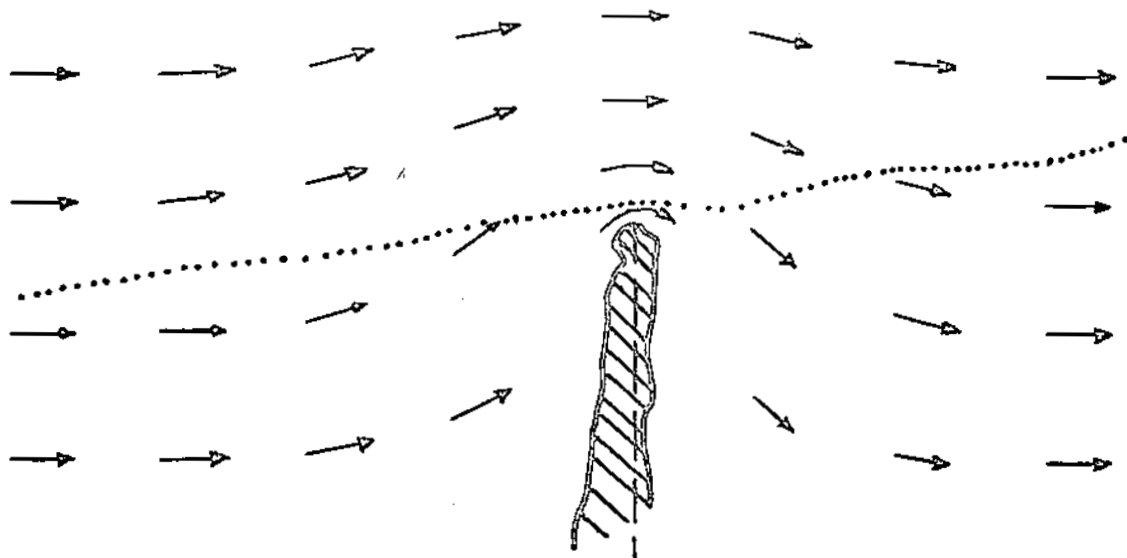
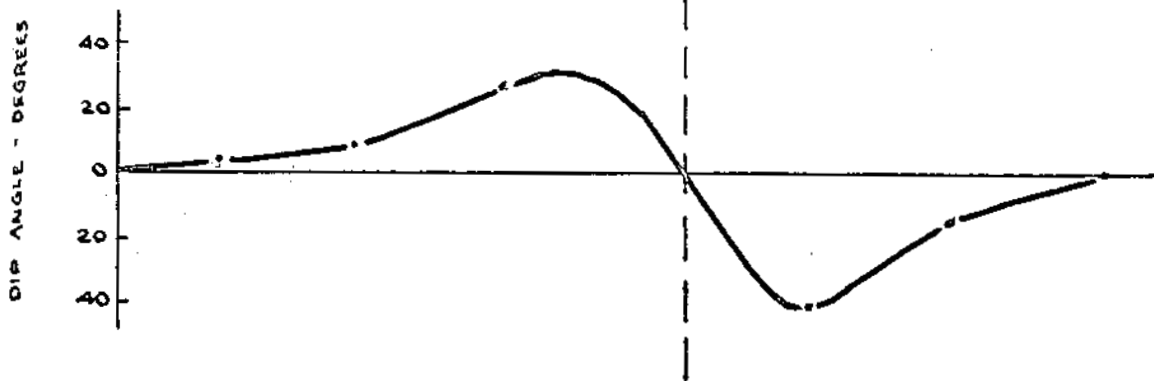


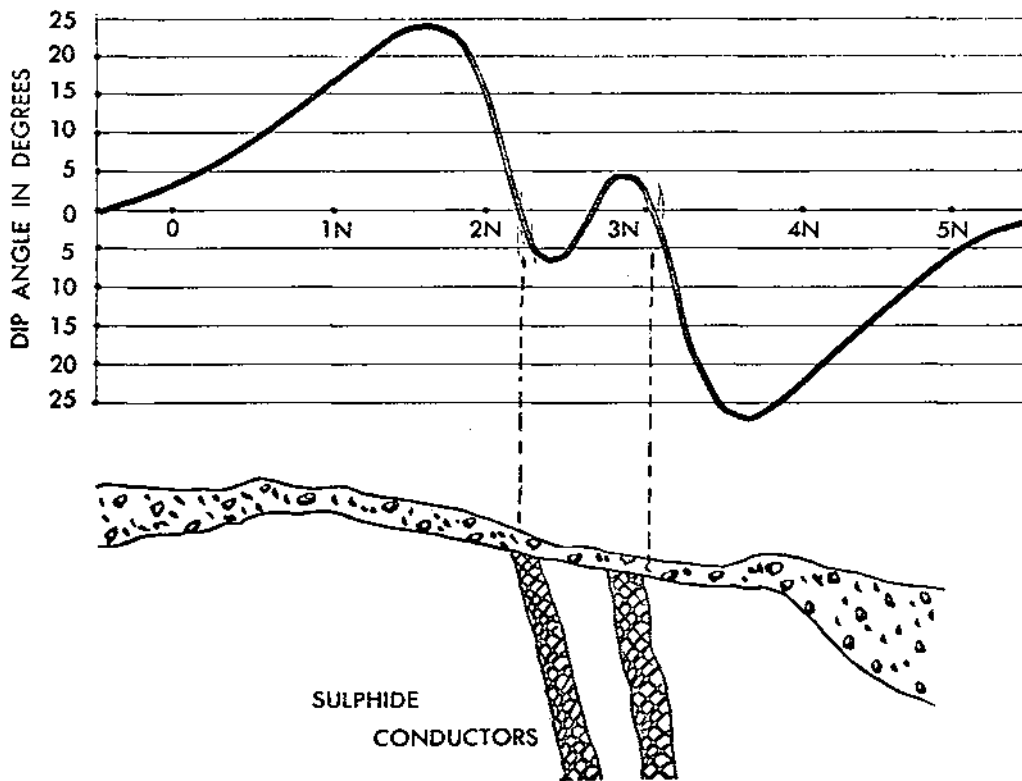
FIGURE 3.



THE VERY LOW FREQUENCY RADIO TRANSMITTING STATIONS

The purpose of these stations is to broadcast over large distances navigational and other information for use by ships and submarines. Numerous stations are situated around the globe and a considerable number are in the process of construction. Operational stations are located at Cutler Maine, Annapolis Maryland, Fort Collins Colorado, Seattle Washington, Balboa Panama, Rugby England, Lualualei Hawaii, Guam and N.W. Cape Australia. The frequency range used varies between 12 and 24 KC's and is thus 10 times higher than the normal frequencies used in mineral prospecting. This results in the RADEM method being more sensitive to lower conductivity and smaller sized bodies than normal EM equipment.

Example of a RADEM traverse over a Banded Conductor in the Timmins area of Ontario.



SPECIFICATIONS

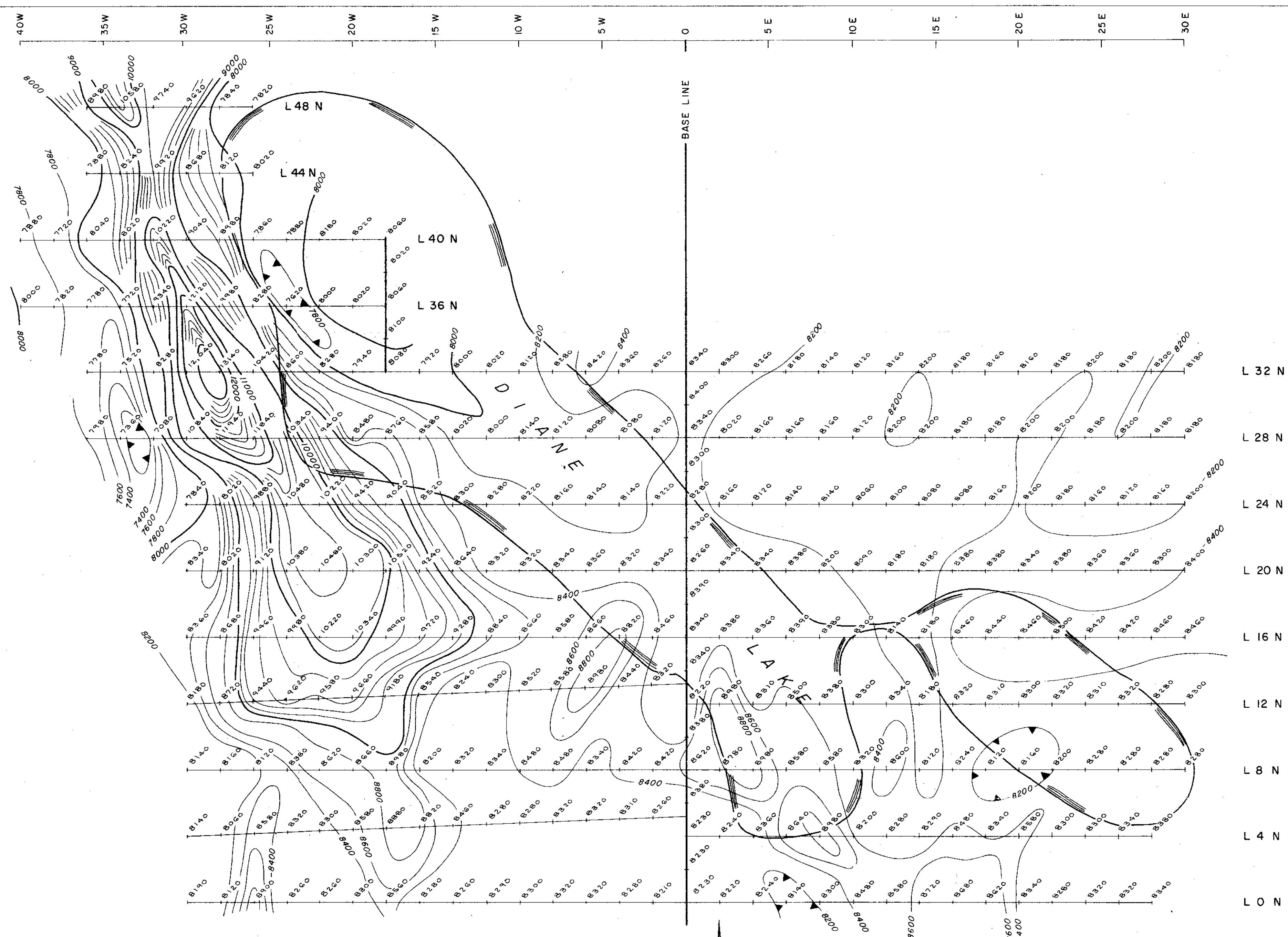
- READOUT** — Dip angle of resultant VLF magnetic field component from an inclinometer of $\pm \frac{1}{2}$ degree sensitivity
- NULL INDICATOR** — Both audio (loudspeaker) and visual by means of an averaging field strength meter
- TUNING** — Preset switch tuning
- BATTERIES** — 2 of 9 volt Eveready # 216, independent test indicators
- STATIONS** — Standard 5 stations — Cutler, Maine 17.8; Seattle, Wash. 18.6; Ft. Collins, Colorado 20.0; Annapolis, Md. 21.4; Balboa, Panama 24.0 KCs.
 — Optional — N.W. Cape, Australia 15.5; Lualualei, Hawaii 23.4; Rugby, England 16.0 KCs.
 Other stations as they become operational
- WEIGHT** — Receiver — 4 lb. Leather Case — 2 lb. Shipping Weight — 15 lb.

PRICE — \$2,250.00 Canadian

RENTAL — \$150.00 per month

APPENDIX I

RADEM SPECIFICATIONS



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2960 MAP #4

LEGEND

— LINE TRACE AND MAGNETIC INTENSITY IN GAMMAS

ISOMAGNETIC CONTOURS

~ 1000 GAMMAS

~ 200 GAMMAS

~ MAGNETIC DEPRESSION

2960
M-4 R. Woodhuts

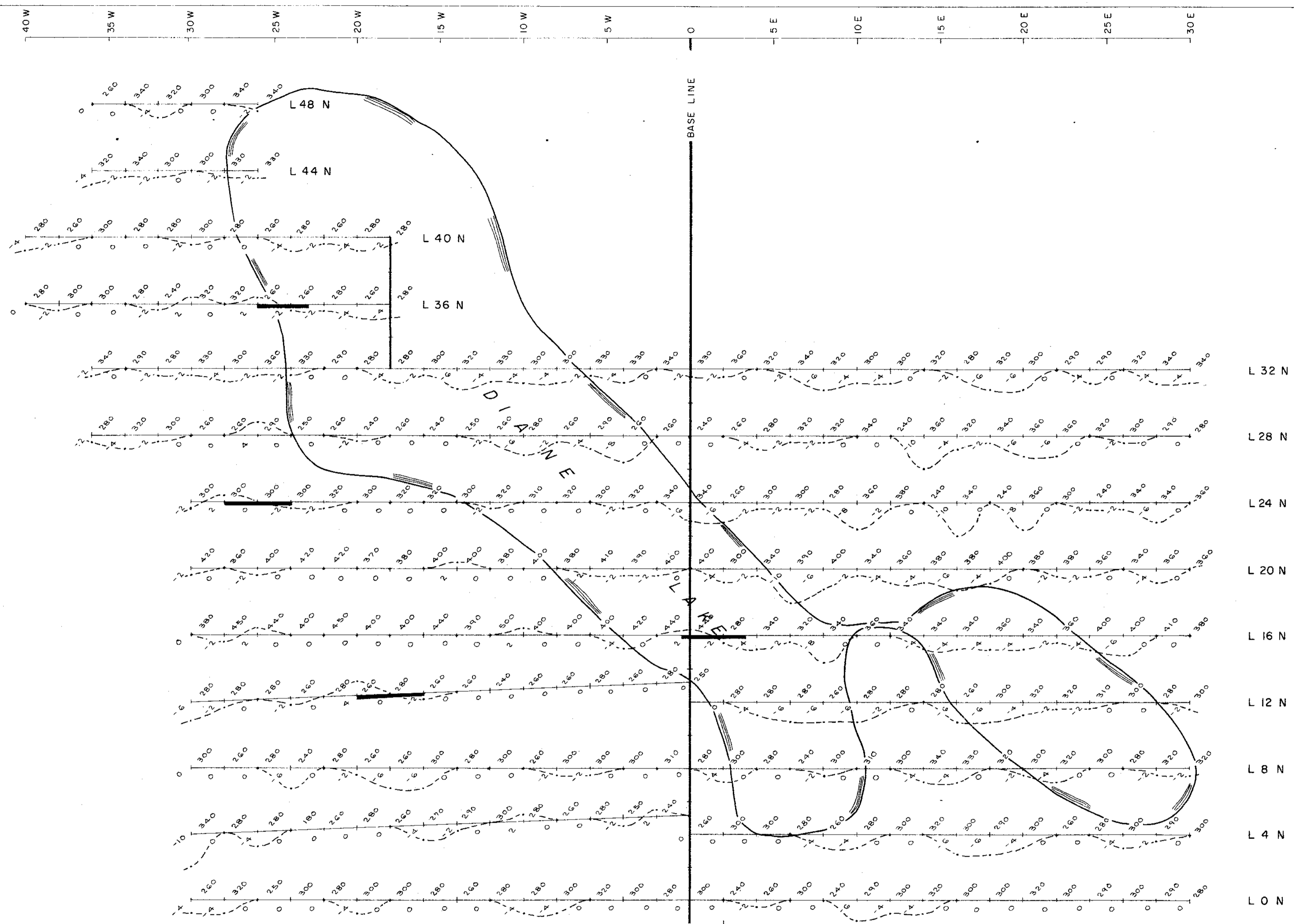
TWIN PEAK MINES LTD.
DIANE PROPERTY
MAGNETOMETER SURVEY
CONTOUR PLAN
OMINECA M.D., B.C.

400 200 0 400 800
SCALE IN FEET

SURVEY BY EVERGREEN EXPLORATIONS LTD.

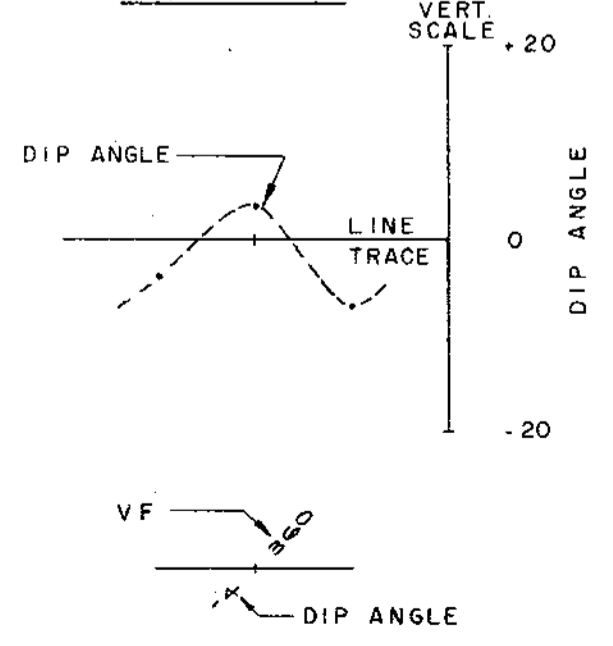
FEB. 1971

TO ACCOMPANY A REPORT, BY R. WOOLVERTON, P. ENG., ON THE DOROTHY CLAIMS DATED 8 April 1971



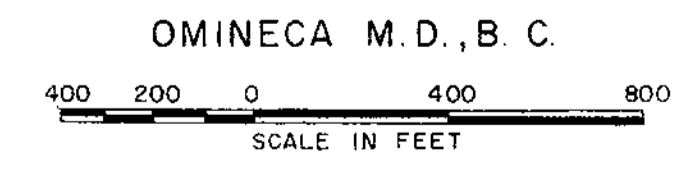
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2960 MAP #5

LEGEND



2960
M-5 *R. Woolverton*

TWIN PEAK MINES LTD.
DIANE PROPERTY
RADEM SURVEY



OMINECA M.D., B.C.
SURVEY BY EVERGREEN EXPLORATIONS LTD.
FEB. 1971

TO ACCOMPANY A REPORT, BY R. WOOLVERTON, P. ENG., ON THE
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