

X: -00
Y: -00

FLIGHT LINE @ 2000' SPACING

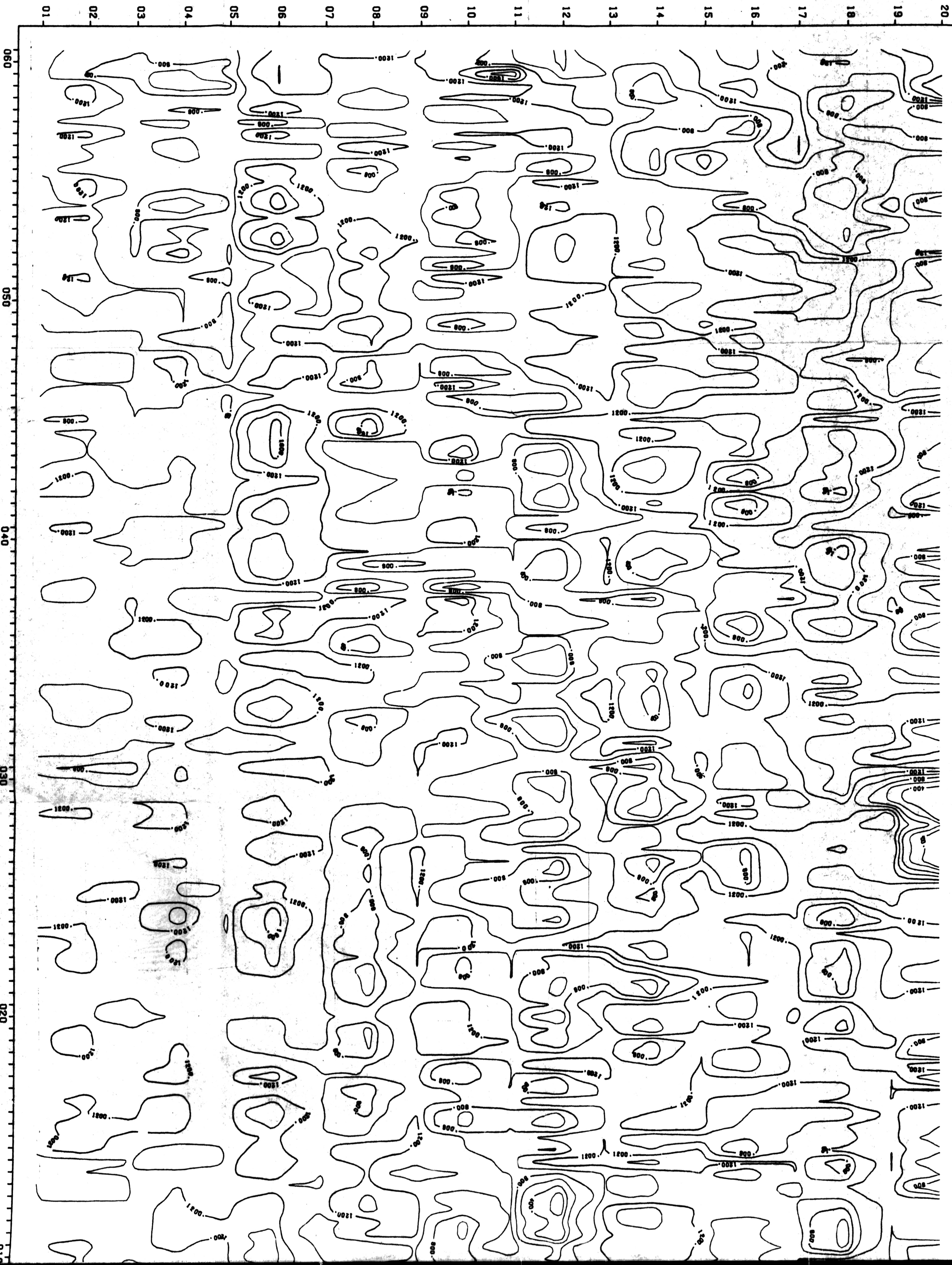
MAGNETICS

PERMIT 6946

C1: 200 GAMMAS

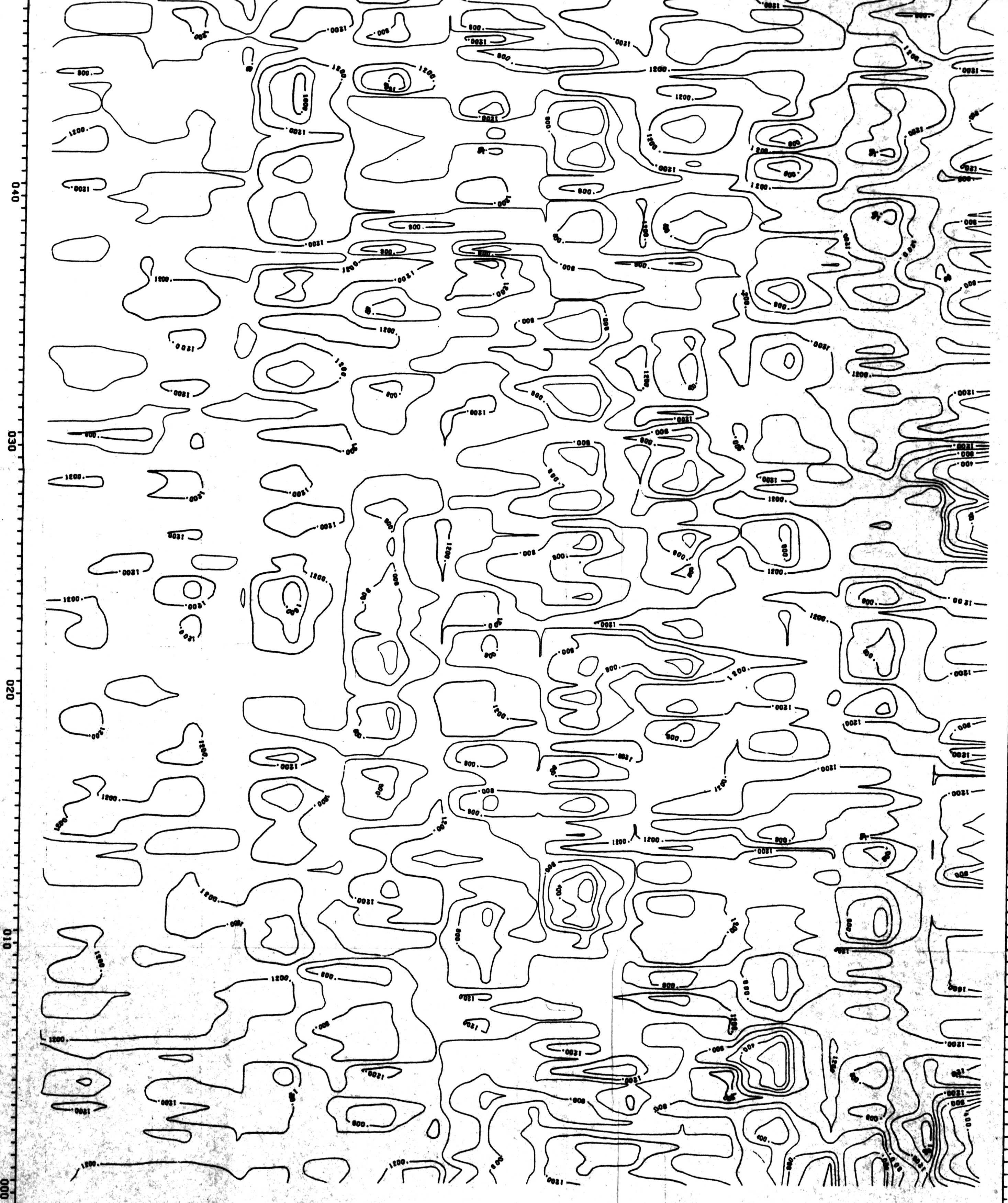
SCALE: 2000 FEET/INCH

1:0000 x HIRON



CI: 200 GAMMAS SCALE: 2000 FEET/INCH

GRID NORTH x 1000 FT



LEGEND

- INSTRUMENT - SHARPE PMF 3
- FLIGHT ALTITUDE - 500 FT. ABOVE GROUND
- SPEED - 113.7 MPH
- AIRCRAFT - COMANCHE TWIN
- UNIT RECORDED - 100 GAMMA
- CONTOUR INT. - 200 GAMMA

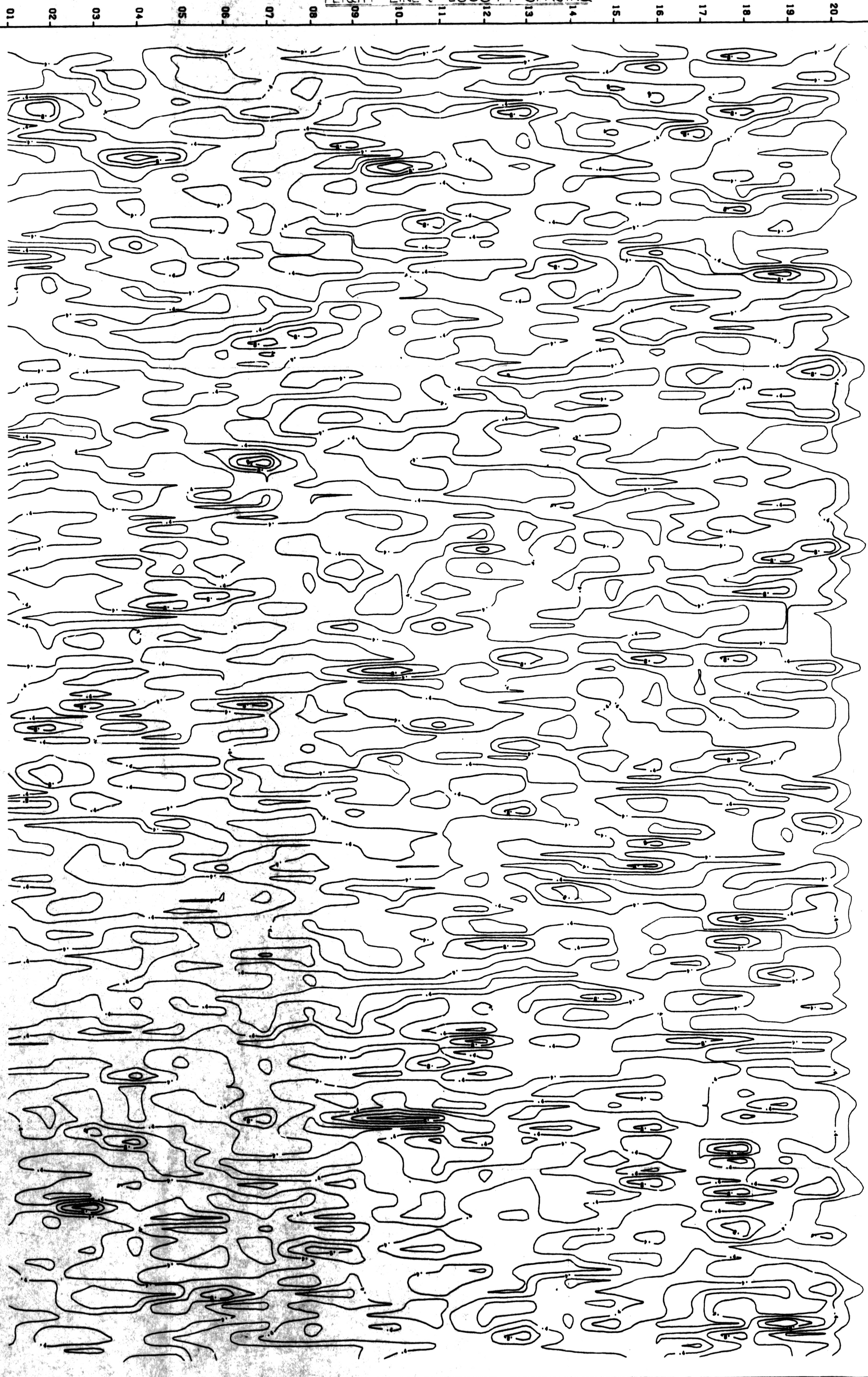


AIRBORNE GEOPHYSICAL SURVEY
MAGNETOMETER
PERMIT No 6946
64°30'N 124°15'W
FORT NORMAN, NORTHWEST TERRITORIES

SEPT. 1971 SCALE IN FEET
GROUP 74.5
813-7-5-71-9 1820-4

FLIGHT LINE @ 2000 FT SPACING

FLIGHT LINE @ 2000 FT SPACING



EM SURVEY PERMIT 6946 CI: 0.2 MICROAMPS SCALE: 2000 FEET/INCH

GRID NORTH = 1000

LEGEND

INSTRUMENT - REC. MERC CELL POWERED RECEIVER
 TRAILING 35 FT. BELOW AIRCRAFT
 TRANSMITTER - FREQUENCY 1000 CPS. ON 630
 FLIGHT ALTITUDE - 500' ABOVE GROUND
 SPEED - 112.7 M.P.H.
 AIRCRAFT - COMANCHE TWIN
 UNIT RECORDED - 0.1 MICROAMPS
 CONTOUR INT. - 0.2 MICROAMPS



AIRBORNE GEOPHYSICAL SURVEY
 ELECTROMAGNETIC
 PERMIT NO 6946
 64°30'N 124°15'W

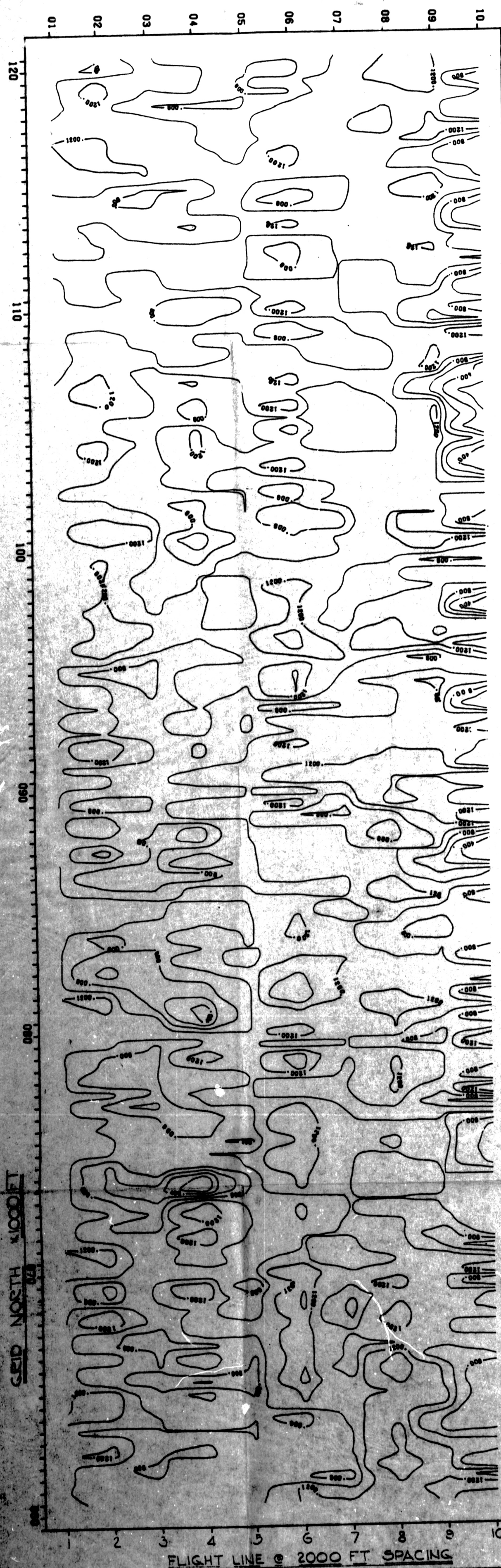
FORT NORMAN, NORTHWEST TERRITORIES

SCALE IN FEET

SEPT 1971 GROUP 745
 813 7-5 71-9 182 B-5

HARVEY H. COHEN ENGINEERING LTD.
 2000 WEST 10TH AVENUE, EDMONTON, ALTA.

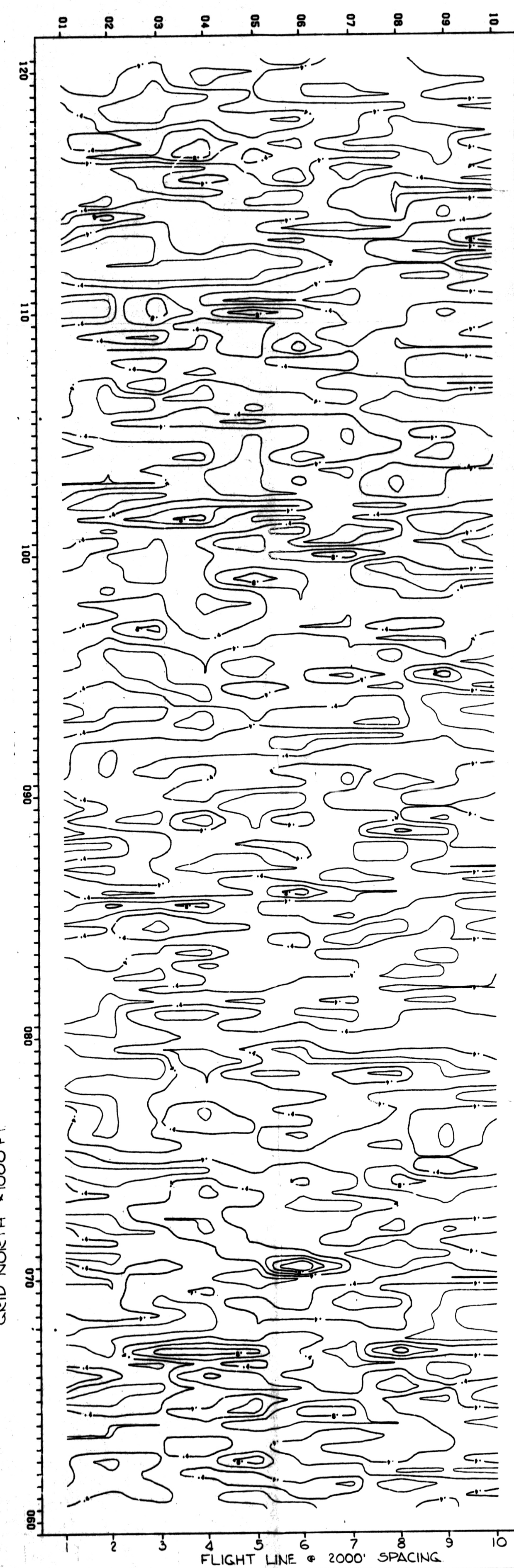
MAGNETICS PERMIT 6947 CI: 200 GAMMAS SCALE: 2000 FEET/INCH



LEGEND
 INSTRUMENT . SHARPE PMF 3
 FLIGHT ALTITUDE . 500 FT ABOVE GROUND
 SPEED . 113.7 MPH
 AIRCRAFT . COMANCHE TWIN
 UNIT RECORDED . 100 GAMMA
 CONTOUR INTERVAL . 200 GAMMA

AIRBORNE GEOPHYSICAL SURVEY
MAGNETOMETER
 PERMIT No. 6947
 64°40'N 124°22'W
 FORT NORMAN, NORTHWEST TERRITORIES
 SCALE IN FEET
 0 1000 2000 3000 4000 5000
 SEPT. 1971 GROUP 745 182 D-7
 815-7-3-71-3
 HARVEY H. COHEN ENGINEERING LTD.
 104 WEST PARKER STREET, VANCOUVER 1, B.C.

EM DATA PERMIT 6947 CI: 0.2 MICRORAMPS SCALE: 2000 FEET/INCH



LEGEND
 INSTRUMENT RECEIVER: VISC CELL POWERED
 TRANSMITTING: 55 FT. BELOW A.C.
 XMTB: FREQ 1000 CPS
 UNITS: 90° CONFIG.
 FLIGHT ALTITUDE: 500 FT. ABOVE GROUND
 SPEED: 113.7 MPH
 AIRCRAFT: COMANCHE TWIN
 UNIT RECORDED: 0.1 MICROAMP
 CONTOUR INT: 0.2 MICROAMP

AIRBORNE GEOPHYSICAL SURVEY
ELECTROMAGNETIC
 PERMIT No. 6947
 64°40'N 124°22'W
 FORT NORMAN, NORTHWEST TERRITORIES
 SCALE IN FEET
 0 1000 2000 3000 4000 5000
 SEPT. 1971 GROUP 745 182 D-7
 815-7-3-71-3
 HARVEY H. COHEN ENGINEERING LTD.
 104 WEST PARKER STREET, VANCOUVER 1, B.C.

813-7-5-3

REPORT ON THE

AIRBORNE GEOPHYSICAL SURVEY

MAGNETOMETER - ELECTROMAGNETIC

PERMIT NO. 6946 64°30'N 124°15' W

PERMIT NO. 6947 64°40'N 124°22½'W

FORT NORMAN AREA

NORTHWEST TERRITORIES

PROJECT NO. 813-7-~~5~~71-9
GROUP 745

J.D. RAGAN, OPERATOR

GLENDALDE DEVELOPMENT CORP. LTD.



HARVEY M. COHEN, P.ENG.

REPORT ON THE
AIRBORNE GEOPHYSICAL SURVEY
MAGNETOMETER - ELECTROMAGNETIC

PERMIT No. 6946 64°30'N 124°15' W

PERMIT No. 6947 64°40'N 124°22½'W

FORT NORMAN AREA
NORTHWEST TERRITORIES

*** * * ***



PROJECT No. 813-7-5-71-9
GROUP 745

J. D. RAGAN, OPERATOR
GLENDALE DEVELOPMENT CORP.



182B-1 KEY MAP SHOWING LOCATION OF FORT NORMAN AREA, NWT.

TABLE OF CONTENTS

Introduction	1
Schedule of Properties	1
Description of Properties	2
Geophysical Investigations	4
Magnetometer Survey	4
Electromagnetic Survey	5
Procedure	6
Results and Conclusions	8
Magnetometer Survey	12
Electromagnetic Survey	13

LIST OF ILLUSTRATIONS

- 182B-1 Key Map Showing Location of
Fort Norman Area
Northwest Territories
- 182B-2 Flight Line and Grid Pattern
Airborne Geophysical Survey
Permit No. 6946 & 6947
Fort Norman Area
Northwest Territories
- 182B-4 Airborne Geophysical Survey
Magnetometer
Permit No. 6946
Fort Norman Area
Northwest Territories
- 182B-5 Airborne Geophysical Survey
Electromagnetic
Permit No. 6946
Fort Norman Area
Northwest Territories
- 182B-6 Airborne Geophysical Survey
Magnetometer
Permit No. 6947
Fort Norman Area
Northwest Territories
- 182B-7 Airborne Geophysical Survey
Electromagnetic
Permit No. 6947
Fort Norman Area
Northwest Territories

REPORT ON THE
AIRBORNE GEOPHYSICAL SURVEY

MAGNETOMETER - ELECTROMAGNETIC

PERMIT NO. 6946 64°30'N 124°15' W

PERMIT NO. 6947 64°40'N 124°22½'W

FORT NORMAN AREA

NORTHWEST TERRITORIES

INTRODUCTION

SCHEDULE OF PROPERTIES:

PERMIT No. 6946 is comprised of the grid area designated by North Latitude 64°30' and West Longitude 124°15' covering an area of 55,334 acres. The Permit holder is Glendale Development Corp. Ltd., date of issue being January 16, 1970. The permit area is shown on Map 96C "Fort Norman" sheet of the

National Topographic System.

**PERMIT No. 6947 is designated by North Latitude
64°40' and West Longitude
124°22½' covering an area of
27,500 acres. The Permit is
issued to Glendale Development
Corp. Ltd. on January 16, 1970.
The permit area is shown on
Map 96C "Fort Norman" sheet of the
National Topographic System.**

**Operator for purposes of conducting fieldwork on
the subject Permits is J. D. Ragan of Vancouver, B.C.**

DESCRIPTION OF PROPERTIES

**PERMIT NOS 6946 & 6947
FORT NORMAN AREA, NWT.**

**The two permits have a common boundary at Lat.
64°30' and the following description can apply to both.
The area lies east of the Mackenzie River valley along
the westerly slopes of the McConnell Range of the
Franklin Mountains. The Mackenzie River parallels closely
the west boundary of the two permit areas and flows northerly**

between eight and fifteen miles west of the property. The valley elevation is approximately 300 feet above sea level while the slopes easterly rise to heights of 3500 feet above sea level. The average elevation of the permit area is from 1500 to 2000 feet with moderate slopes. Mt. Clark, just east of Permit 6946 peaks at 4798 feet, and provides a landmark that shows prominently during the survey.

The area generally has been subjected to a gentle folding system striking northwesterly with secondary fault systems sub-parallel to the axis of the primary structure, characteristic of the eastern Cordillera.

The north part of the permit area is overlain by sandstone (Cambrian) while to the south, the Franklin Mountain series of dolomites and limestones (Ordovician and Silurian) outcrop. Palaeozoic sediments continue to the south grading into younger limestones, dolomites and shales. To the east of the subject area, is a broad expanse of Cretaceous shales and sandstones

To the south of the area, prominent fault scarps are in evidence, forming the headwaters of secondary creeks feeding the Mackenzie River to the west.

GEOPHYSICAL INVESTIGATIONS

MAGNETOMETER SURVEY:

The purpose of the Magnetometer Survey was to determine the presence or absence of any magnetic or non magnetic anomalies on the property, these anomalies being caused by the presence or absence of magnetic accessory minerals in the underlying rock formations in detectable quantity. The magnetic field measurements would differentiate between sediments, volcanics, intrusives, and indicate any changes in the basement rock structures. The factors, applicable to this survey, which produce variations in the magnetic field are:

1. A variation in amount of accessory mineral magnetite in granitic or sedimentary bedrock.
2. A variation in amount of magnetics distributed through or connected with the overburden.
3. A variation in depth of non magnetic overburden on caprock over bedrock having a constant vertical magnetic intensity.
4. Variations in amount of magnetics in adjacent bands of sedimentary or volcanic rocks. These

variations are not expected to be great, and they produce elongated highs and lows parallel to the strike of the formation.

5. Any combination between variations in magnetic minerals in the rock and variations in the thickness of the overlying magnetic or non magnetic overburden or caprock.

It will be seen from the above factors that the geophysical survey employing magnetometer produces information that would assist in providing a structural picture of the subsurface geology.

ELECTROMAGNETIC SURVEY:

The Electromagnetic Survey, conducted simultaneously with the Magnetometer Survey, measures the change in mutual impedance between a pair of coils as the impedance is affected by nearby conductors of electricity. The equipment employed transmits a field through a 65 foot coil mounted beneath the aircraft. Transmission frequency was set at 1000 cycles per second. The receiving coil is housed in a "bird" drawn by the aircraft with a 90° configuration between the coils. It records any electrical fields induced by the transmitted

field.

Instrumentation is continuous, and data is recorded on film at preset 500 foot intervals to include readings of magnetometer, electromagnetic, time, direction of flight, reading number (grid north), flight line number, and elevation. Recovery of data and introduction to processing methods is described in a subsequent section.

PROCEDURE

Permit areas Nos. 6946 and 6947 were marked out on Map Sheet 96C "Fort Norman". Flight lines, 20 in number, were marked as a grid pattern with lines extrapolated to provide intersections with prominent landmarks used as a guide during flight. The aircraft was serviced at Vancouver, flown to Norman Wells and this location was used as a base to prepare for the survey. Transmitter coil was mounted on the aircraft, recording data prepared, and the survey was flown in periods of extreme calm weather. The property lies approximately 95 miles southeast of Norman Wells. An aircraft, Comanche Twin, completed the survey by August 17th, 1971.

Flight lines were flown at an altitude of 500 feet above ground, and at a constant speed of 113.7

miles per hour. The true heading 0° and 180° was maintained by automatic gyro controls in the aircraft. Flight lines were commenced at the south limit, flown for 120,000 feet plus turning and reorienting distance.

The instrumentation operated continuously, but the data recording system, employing photography, filmed an instrument panel with one frame at a pre set time interval to provide a record of all data at a distance of 500 feet along the flight line.

Data recovery included the editing of the film record, introducing the data to a card punching procedure for transmission from Vancouver to the Computer Sciences Univac 1108 based at Calgary, Alberta. The tapes were subsequently introduced with the program to CalComp for plotting. A statistical analysis was made by computer to determine the contour interval and frequency of readings. The enclosed geophysical maps are the results of this procedure.

Flight Line 1 commenced 1,000 feet east of the west boundary of the property, and was flown to cover the two permit areas for a length of 61,000 feet plus an additional 60,000 feet as well as turning and reorienting distances. A total of 20 flight lines were flown to adequately cover the ground for a total of 460 line miles.

Including overruns, turning and reorienting, periodic rechecks to compensate for variations and calibrating, the total line miles flown over Permit Nos. 6946 and 6947 would be approximately 600. (It was necessary to repeat Permit No. 6947 due to turbulent conditions during the first survey).

RESULTS AND CONCLUSIONS

Z-VALUE STATISTICS EM DATA PERMIT 6946:

No. of observations	=	2420
Minimum value	=	.00
Maximum value	=	15.00
Mean	=	3.91
Standard deviation	=	2.40

Z-VALUE FREQUENCIES

<u>INTERVAL</u>		<u>NUMBER</u>	<u>%</u>	<u>CULM.%</u>
.00 to	.99	21	.87	.87
1.00	1.99	460	19.01	19.88
2.00	2.99	377	15.58	35.45
3.00	3.99	240	9.92	45.37
4.00	4.99	271	11.20	56.57
5.00	5.99	562	23.22	79.79
6.00	6.99	195	8.06	87.85
7.00	7.99	144	5.95	93.80
8.00	8.99	21	.87	94.67
9.00	9.99	49	2.02	96.69
10.00	10.99	57	2.36	99.05
v 11.00	11.99	12	.50	99.55
12.00	12.99	6	.25	99.79
13.00	13.99	1	.04	99.83
14.00	14.99	1	.04	99.88
15.00	15.99	3	.12	100.00

Z-VALUE STATISTICS EM DATA PERMIT 6947:

No. of observations	=	1210
Minimum value	=	.00
Maximum value	=	15.00
Mean	=	3.82
Standard deviation	=	2.27

Z-VALUE FREQUENCIES

<u>INTERVAL</u>		<u>NUMBER</u>	<u>%</u>	<u>CULM.%</u>
.00 to .99		14	1.16	1.16
1.00 1.99		227	18.76	19.92
2.00 2.99		168	13.88	33.80
3.00 3.99		145	11.98	45.79
4.00 4.99		165	13.64	59.42
5.00 5.99		252	20.83	80.25
6.00 6.99		119	9.83	90.08
7.00 7.99		57	4.71	94.79
8.00 8.99		7	.58	95.37
9.00 9.99		29	2.40	97.77
10.00 10.99		24	1.98	99.75
11.00 11.99		1	.08	99.83
12.00 12.99		1	.08	99.92
13.00 13.99		0	.00	99.92
14.00 14.99		0	.00	99.92
15.00 15.99		1	.08	100.00

Z-VALUE STATISTICS MAGNETICS - PERMIT NO. 6946:

Number of observations = 2420
Minimum value = .00
Maximum value = 20.00
Mean = 10.46
Standard deviation = 2.79

Z-VALUE FREQUENCIES

<u>INTERVAL</u>	<u>NUMBER</u>	<u>%</u>	<u>CULM.%</u>
.00 to .99	19	.79	.79
1.00 1.99	0	.00	.79
2.00 2.99	9	.37	1.16
3.00 3.99	10	.41	1.57
4.00 4.99	15	.62	2.19
5.00 5.99	100	4.13	6.32
6.00 6.99	53	2.19	8.51
7.00 7.99	173	7.15	15.66
8.00 8.99	156	6.45	22.11
9.00 9.99	172	7.11	29.21
10.00 10.99	608	25.12	54.34
11.00 11.99	298	12.31	66.65
12.00 12.99	386	15.95	82.60
13.00 13.99	166	6.86	89.46
14.00 14.99	106	4.38	93.84
15.00 15.99	101	4.17	98.02
16.00 16.99	19	.79	98.80
17.00 17.99	23	.95	99.75
18.00 18.99	4	.17	99.92
19.00 19.99	0	.00	99.92
20.00 20.99	2	.08	100.00

Z-VALUE STATISTICS MAGNETICS PERMIT NO. 6947:

Number of observations = 1206
Minimum value = .00
Maximum value = 17.00
Mean = 9.90
Standard deviation = 2.50

Z-VALUE FREQUENCIES

<u>INTERVAL</u>		<u>NUMBER</u>	<u>%</u>	<u>CULM.%</u>
.00 to	.99	12	1.00	1.00
1.00	1.99	0	.00	1.00
2.00	2.99	6	.50	1.50
3.00	3.99	6	.50	1.99
4.00	4.99	4	.33	2.32
5.00	5.99	38	3.15	5.47
6.00	6.99	33	2.74	8.21
7.00	7.99	92	7.63	15.84
8.00	8.99	137	11.36	27.20
9.00	9.99	121	10.03	37.23
10.00	10.99	352	29.19	66.42
11.00	11.99	151	12.52	78.94
12.00	12.99	155	12.85	91.79
13.00	13.99	37	3.07	94.86
14.00	14.99	37	3.07	97.93
15.00	15.99	19	1.58	99.50
16.00	16.99	6	.50	99.99
17.00	17.99	4	.33	100.32

MAGNETOMETER SURVEY:

The field strength of dolomite in gammas is approximately twice that of shale, and in field measurements would contour the crystalline basement and intrusive bodies.

With the instrument set at 10 scale, the average variation in vertical component of magnetic field was 2.79 and 2.50 respectively on Permit 6946 and 6947. Readings of plus or minus 600 gammas, indicative of magnetic accessory mineral common to intrusive masses were less than 2%. The mean magnetic response measured appears higher to the south than to the north. This would indicate a dolomite mass to the south and shales or sandstone to the north. The contact appears as a east-west markation just south of the north boundary of Permit 6946 at North 58,000. A second parallel zone of greater than average magnetic intensity crosses at North 45,000. The indications appear to coincide with conformity to the east-west structures and differentiation between the two suggested rock types.

ELECTROMAGNETIC SURVEY:

EM Response measured during this survey ranged from 0 to 1.5 microamps. The average mean reading obtained on Permit 6946 was 3.91 and on 6947 the mean value was 3.82. Intensities in this range are indicative of slight conductivity due to possible minor carbonaceous content in the underlying rock. Several distinct zones of higher conductivity striking east - west are fracture systems and shears carrying electrolyte. One zone crosses the permit area at Grid North 12,000, where the surface representation of the shear zone is in the form of a flowing creek. The zone located at Grid North 35,000 parallels an east-west rise in the slope of the hill, and is a possible step fault related to the Mt. Clark feature.

For the most part, the underlying structures appear relatively undisturbed.



HARVEY H. COHEN, P.ENG.

REPORT ON THE
AIRBORNE GEOPHYSICAL SURVEY
MAGNETOMETER - ELECTROMAGNETIC

PERMIT No. 6946 64°30'N 124°15' W
PERMIT No. 6947 64°40'N 124°22½'W

FORT NORMAN AREA
NORTHWEST TERRITORIES

* * * *



PROJECT No. 813-7-5-71-9
GROUP 745

J. D. RAGAN, OPERATOR
GLENDALE DEVELOPMENT CORP.



182B-1 KEY MAP SHOWING LOCATION OF FORT NORMAN AREA, NWT.

TABLE OF CONTENTS

Introduction	1
Schedule of Properties	1
Description of Properties	2
Geophysical Investigations	4
Magnetometer Survey	4
Electromagnetic Survey	5
Procedure	6
Results and Conclusions	8
Magnetometer Survey	12
Electromagnetic Survey	13

LIST OF ILLUSTRATIONS

- 182B-1 Key Map Showing Location of
Fort Norman Area
Northwest Territories
- 182B-2 Flight Line and Grid Pattern
Airborne Geophysical Survey
Permit No. 6946 & 6947
Fort Norman Area
Northwest Territories
- 182B-4 Airborne Geophysical Survey
Magnetometer
Permit No. 6946
Fort Norman Area
Northwest Territories
- 182B-5 Airborne Geophysical Survey
Electromagnetic
Permit No. 6946
Fort Norman Area
Northwest Territories
- 182B-6 Airborne Geophysical Survey
Magnetometer
Permit No. 6947
Fort Norman Area
Northwest Territories
- 182B-7 Airborne Geophysical Survey
Electromagnetic
Permit No. 6947
Fort Norman Area
Northwest Territories

REPORT ON THE
AIRBORNE GEOPHYSICAL SURVEY

MAGNETOMETER - ELECTROMAGNETIC

PERMIT NO. 6946 64°30'N 124°15' W

PERMIT NO. 6947 64°40'N 124°22½'W

FORT NORMAN AREA

NORTHWEST TERRITORIES

INTRODUCTION

SCHEDULE OF PROPERTIES:

PERMIT No. 6946 is comprised of the grid area designated by North Latitude 64°30' and West Longitude 124°15' covering an area of 55,334 acres. The Permit holder is Glendale Development Corp. Ltd., date of issue being January 16, 1970. The permit area is shown on Map 96C "Fort Norman" sheet of the

National Topographic System.

**PERMIT No. 6947 is designated by North Latitude
64°40' and West Longitude
124°22½' covering an area of
27,500 acres. The Permit is
issued to Glendale Development
Corp. Ltd. on January 16, 1970.
The permit area is shown on
Map 96C "Fort Norman" sheet of the
National Topographic System.**

**Operator for purposes of conducting fieldwork on
the subject Permits is J. D. Ragan of Vancouver, B.C.**

DESCRIPTION OF PROPERTIES

**PERMIT NOS 6946 & 6947
FORT NORMAN AREA, NWT.**

**The two permits have a common boundary at Lat.
64°30' and the following description can apply to both.
The area lies east of the Mackenzie River valley along
the westerly slopes of the McConnell Range of the
Franklin Mountains. The Mackenzie River parallels closely
the west boundary of the two permit areas and flows northerly**

between eight and fifteen miles west of the property. The valley elevation is approximately 300 feet above sea level while the slopes easterly rise to heights of 3500 feet above sea level. The average elevation of the permit area is from 1500 to 2000 feet with moderate slopes. Mt. Clark, just east of Permit 6946 peaks at 4798 feet, and provides a landmark that shows prominently during the survey.

The area generally has been subjected to a gentle folding system striking northwesterly with secondary fault systems sub-parallel to the axis of the primary structure, characteristic of the eastern Cordillera.

The north part of the permit area is overlain by sandstone (Cambrian) while to the south, the Franklin Mountain series of dolomites and limestones (Ordovician and Silurian) outcrop. Palaeozoic sediments continue to the south grading into younger limestones, dolomites and shales. To the east of the subject area, is a broad expanse of Cretaceous shales and sandstones

To the south of the area, prominent fault scarps are in evidence, forming the headwaters of secondary creeks feeding the Mackenzie River to the west.

GEOPHYSICAL INVESTIGATIONS

MAGNETOMETER SURVEY:

The purpose of the Magnetometer Survey was to determine the presence or absence of any magnetic or non magnetic anomalies on the property, these anomalies being caused by the presence or absence of magnetic accessory minerals in the underlying rock formations in detectable quantity. The magnetic field measurements would differentiate between sediments, volcanics, intrusives, and indicate any changes in the basement rock structures. The factors, applicable to this survey, which produce variations in the magnetic field are:

1. A variation in amount of accessory mineral magnetite in granitic or sedimentary bedrock.
2. A variation in amount of magnetics distributed through or connected with the overburden.
3. A variation in depth of non magnetic overburden on caprock over bedrock having a constant vertical magnetic intensity.
4. Variations in amount of magnetics in adjacent bands of sedimentary or volcanic rocks. These

variations are not expected to be great, and they produce elongated highs and lows parallel to the strike of the formation.

5. Any combination between variations in magnetic minerals in the rock and variations in the thickness of the overlying magnetic or non magnetic overburden or caprock.

It will be seen from the above factors that the geophysical survey employing magnetometer produces information that would assist in providing a structural picture of the subsurface geology.

ELECTROMAGNETIC SURVEY:

The Electromagnetic Survey, conducted simultaneously with the Magnetometer Survey, measures the change in mutual impedance between a pair of coils as the impedance is affected by nearby conductors of electricity. The equipment employed transmits a field through a 65 foot coil mounted beneath the aircraft. Transmission frequency was set at 1000 cycles per second. The receiving coil is housed in a "bird" drawn by the aircraft with a 90° configuration between the coils. It records any electrical fields induced by the transmitted

field.

Instrumentation is continuous, and data is recorded on film at preset 500 foot intervals to include readings of magnetometer, electromagnetic, time, direction of flight, reading number(grid north), flight line number, and elevation. Recovery of data and introduction to processing methods is described in a subsequent section.

PROCEDURE

Permit areas Nos. 6946 and 6947 were marked out on Map Sheet 96C " Fort Norman". Flight lines, 20 in number, were marked as a grid pattern with lines extrapolated to provide intersections with prominent landmarks used as a guide during flight. The aircraft was serviced at Vancouver, flown to Norman Wells and this location was used as a base to prepare for the survey. Transmitter coil was mounted on the aircraft, recording data prepared, and the survey was flown in periods of extreme calm weather. The property lies approximately 95 miles southeast of Norman Wells. An aircraft, Comanche Twin, completed the survey by August 17th, 1971.

Flight lines were flown at an altitude of 500 feet above ground, and at a constant speed of 113.7

miles per hour. The true heading 0° and 180° was maintained by automatic gyro controls in the aircraft. Flight lines were commenced at the south limit, flown for 120,000 feet plus turning and reorienting distance.

The instrumentation operated continuously, but the data recording system, employing photography, filmed an instrument panel with one frame at a pre set time interval to provide a record of all data at a distance of 500 feet along the flight line.

Data recovery included the editing of the film record, introducing the data to a card punching procedure for transmission from Vancouver to the Computer Sciences Univac 1108 based at Calgary, Alberta. The tapes were subsequently introduced with the program to CalComp for plotting. A statistical analysis was made by computer to determine the contour interval and frequency of readings. The enclosed geophysical maps are the results of this procedure.

Flight Line 1 commenced 1,000 feet east of the west boundary of the property, and was flown to cover the two permit areas for a length of 61,000 feet plus an additional 60,000 feet as well as turning and reorienting distances. A total of 20 flight lines were flown to adequately cover the ground for a total of 460 line miles.

Including overruns, turning and reorienting, periodic rechecks to compensate for variations and calibrating, the total line miles flown over Permit Nos. 6946 and 6947 would be approximately 600. (It was necessary to repeat Permit No. 6947 due to turbulent conditions during the first survey).

RESULTS AND CONCLUSIONS

Z-VALUE STATISTICS EM DATA PERMIT 6946:

No. of observations	=	2420
Minimum value	=	.00
Maximum value	=	15.00
Mean	=	3.91
Standard deviation	=	2.40

Z-VALUE FREQUENCIES

<u>INTERVAL</u>	<u>NUMBER</u>	<u>%</u>	<u>CULM.%</u>
.00 to .99	21	.87	.87
1.00 1.99	460	19.01	19.88
2.00 2.99	377	15.58	35.45
3.00 3.99	240	9.92	45.37
4.00 4.99	271	11.20	56.57
5.00 5.99	562	23.22	79.79
6.00 6.99	195	8.06	87.85
7.00 7.99	144	5.95	93.80
8.00 8.99	21	.87	94.67
9.00 9.99	49	2.02	96.69
10.00 10.99	57	2.36	99.05
v 11.00 11.99	12	.50	99.55
12.00 12.99	6	.25	99.79
13.00 13.99	1	.04	99.83
14.00 14.99	1	.04	99.88
15.00 15.99	3	.12	100.00

Z-VALUE STATISTICS EM DATA PERMIT 6947:

No. of observations	=	1210
Minimum value	=	.00
Maximum value	=	15.00
Mean	=	3.82
Standard deviation	=	2.27

Z-VALUE FREQUENCIES

<u>INTERVAL</u>		<u>NUMBER</u>	<u>%</u>	<u>CULM.%</u>
.00 to .99		14	1.16	1.16
1.00 1.99		227	18.76	19.92
2.00 2.99		168	13.88	33.80
3.00 3.99		145	11.98	45.79
4.00 4.99		165	13.64	59.42
5.00 5.99		252	20.83	80.25
6.00 6.99		119	9.83	90.08
7.00 7.99		57	4.71	94.79
8.00 8.99		7	.58	95.37
9.00 9.99		29	2.40	97.77
10.00 10.99		24	1.98	99.75
11.00 11.99		1	.08	99.83
12.00 12.99		1	.08	99.92
13.00 13.99		0	.00	99.92
14.00 14.99		0	.00	99.92
15.00 15.99		1	.08	100.00

Z-VALUE STATISTICS MAGNETICS - PERMIT NO. 6946:

Number of observations = 2420
Minimum value = .00
Maximum value = 20.00
Mean = 10.46
Standard deviation = 2.79

Z-VALUE FREQUENCIES

<u>INTERVAL</u>		<u>NUMBER</u>	<u>%</u>	<u>CULM.%</u>
.00 to .99		19	.79	.79
1.00 1.99		0	.00	.79
2.00 2.99		9	.37	1.16
3.00 3.99		10	.41	1.57
4.00 4.99		15	.62	2.19
5.00 5.99		100	4.13	6.32
6.00 6.99		53	2.19	8.51
7.00 7.99		173	7.15	15.66
8.00 8.99		156	6.45	22.11
9.00 9.99		172	7.11	29.21
10.00 10.99		608	25.12	54.34
11.00 11.99		298	12.31	66.65
12.00 12.99		386	15.95	82.60
13.00 13.99		166	6.86	89.46
14.00 14.99		106	4.38	93.84
15.00 15.99		101	4.17	98.02
16.00 16.99		19	.79	98.80
17.00 17.99		23	.95	99.75
18.00 18.99		4	.17	99.92
19.00 19.99		0	.00	99.92
20.00 20.99		2	.08	100.00

Z-VALUE STATISTICS MAGNETICS PERMIT NO. 6947:

Number of observations = 1206
Minimum value = .00
Maximum value = 17.00
Mean = 9.90
Standard deviation = 2.50

Z-VALUE FREQUENCIES

<u>INTERVAL</u>	<u>NUMBER</u>	<u>%</u>	<u>CULM.%</u>
.00 to .99	12	1.00	1.00
1.00 1.99	0	.00	1.00
2.00 2.99	6	.50	1.50
3.00 3.99	6	.50	1.99
4.00 4.99	4	.33	2.32
5.00 5.99	38	3.15	5.47
6.00 6.99	33	2.74	8.21
7.00 7.99	92	7.63	15.84
8.00 8.99	137	11.36	27.20
9.00 9.99	121	10.03	37.23
10.00 10.99	352	29.19	66.42
11.00 11.99	151	12.52	78.94
12.00 12.99	155	12.85	91.79
13.00 13.99	37	3.07	94.86
14.00 14.99	37	3.07	97.93
15.00 15.99	19	1.58	99.50
16.00 16.99	6	.50	99.99
17.00 17.99	4	.33	100.32

MAGNETOMETER SURVEY:

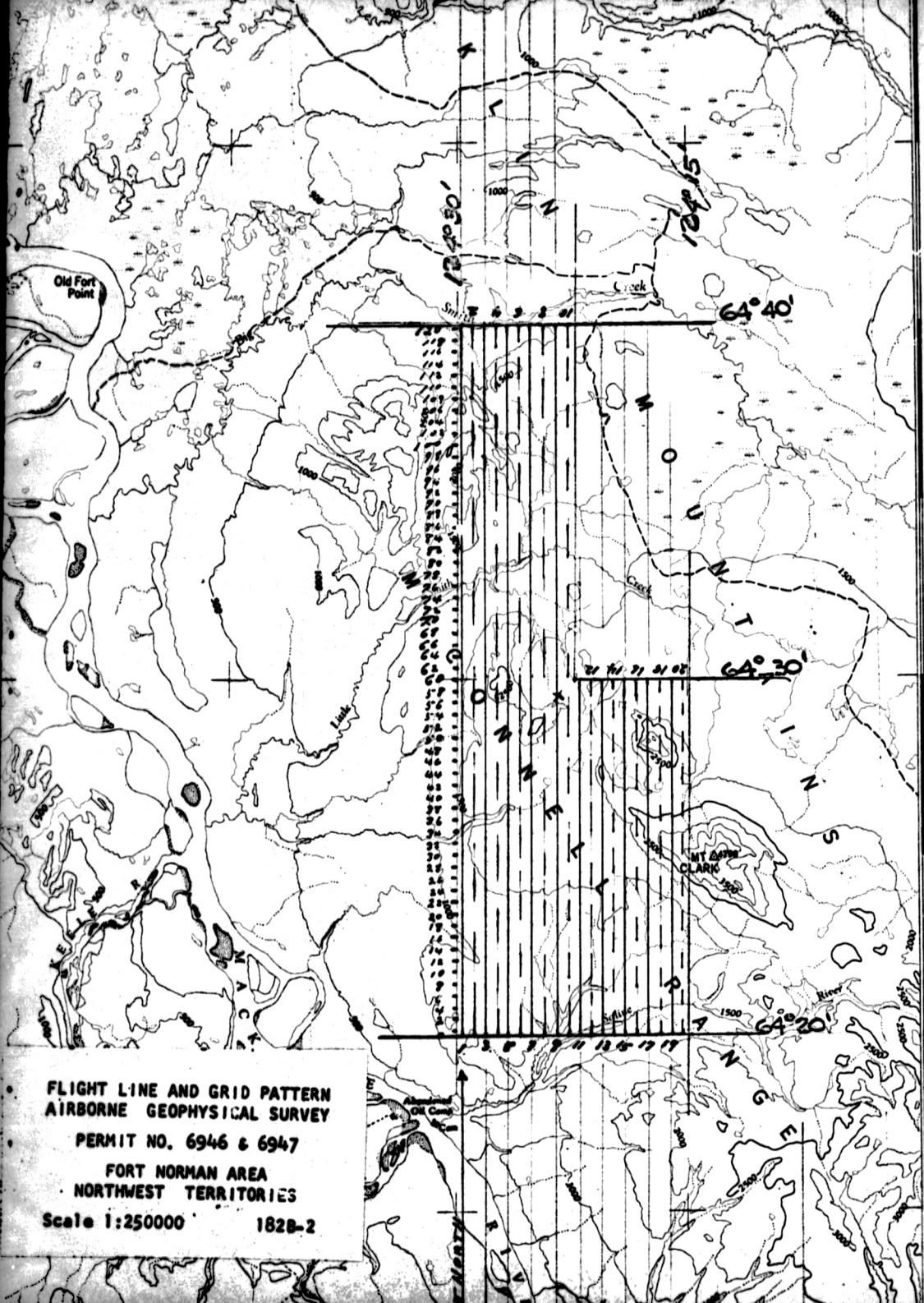
The field strength of dolomite in gammas is approximately twice that of shale, and in field measurements would contour the crystalline basement and intrusive bodies.

With the instrument set at 10 scale, the average variation in vertical component of magnetic field was 2.79 and 2.50 respectively on Permit 6946 and 6947. Readings of plus or minus 600 gammas, indicative of magnetic accessory mineral common to intrusive masses were less than 2%. The mean magnetic response measured appears higher to the south than to the north. This would indicate a dolomite mass to the south and shales or sandstone to the north. The contact appears as a east-west markation just south of the north boundary of Permit 6946 at North 58,000. A second parallel zone of greater than average magnetic intensity crosses at North 45,000. The indications appear to coincide with conformity to the east-west structures and differentiation between the two suggested rock types.

ELECTROMAGNETIC SURVEY:

EM Response measured during this survey ranged from 0 to 1.5 microamps. The average mean reading obtained on Permit 6946 was 3.91 and on 6947 the mean value was 3.82. Intensities in this range are indicative of slight conductivity due to possible minor carbonaceous content in the underlying rock. Several distinct zones of higher conductivity striking east - west are fracture systems and shears carrying electrolyte. One zone crosses the permit area at Grid North 12,000, where the surface representation of the shear zone is in the form of a flowing creek. The zone located at Grid North 35,000 parallels an east-west rise in the slope of the hill, and is a possible step fault related to the Mt. Clark feature.

For the most part, the underlying structures appear relatively undisturbed.



FLIGHT LINE AND GRID PATTERN
AIRBORNE GEOPHYSICAL SURVEY

PERMIT NO. 6946 & 6947

FORT NORMAN AREA
NORTHWEST TERRITORIES

Scale 1:250000

1828-2