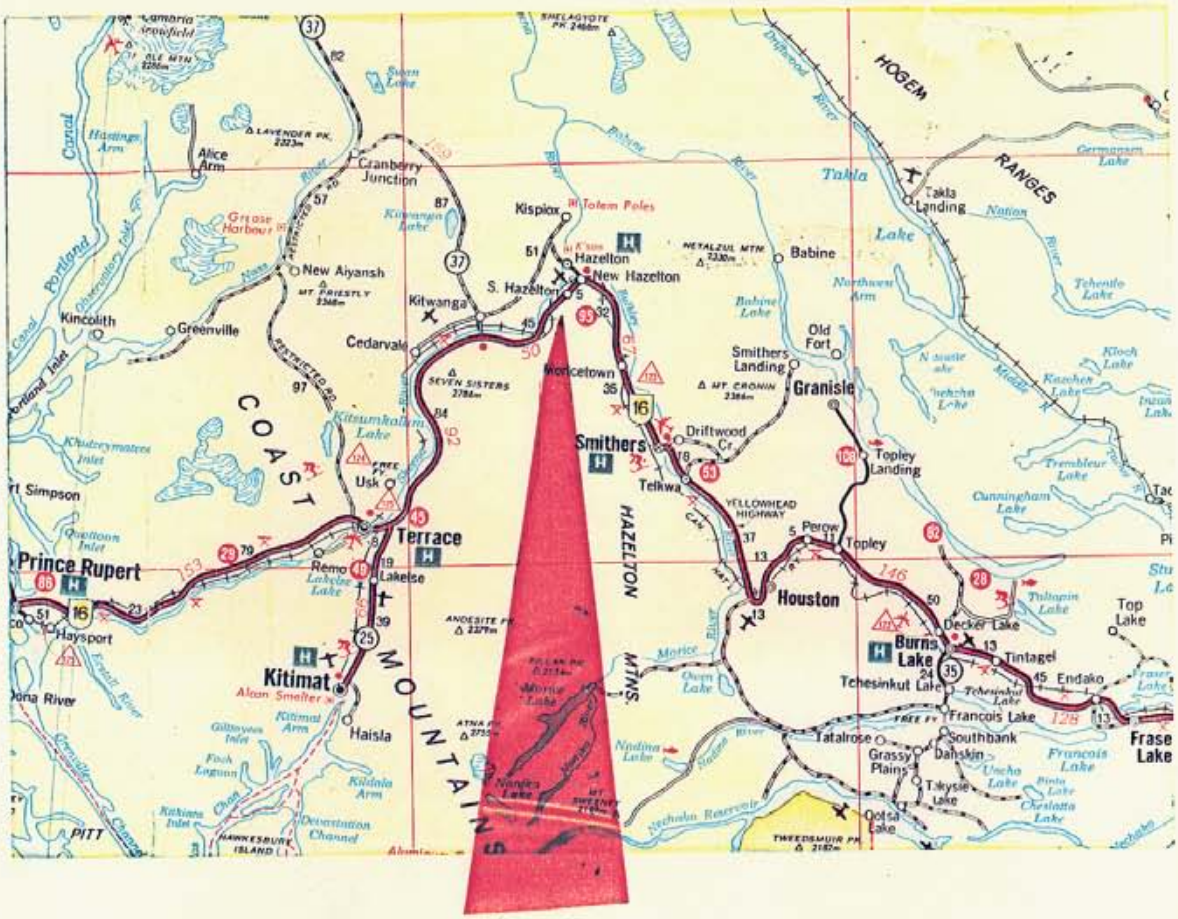
COBRE EXPLORATIONS LIMITED
GEO PHYSICAL REPORT
on an
Airborne VLF-EM and Magnetometer Survey

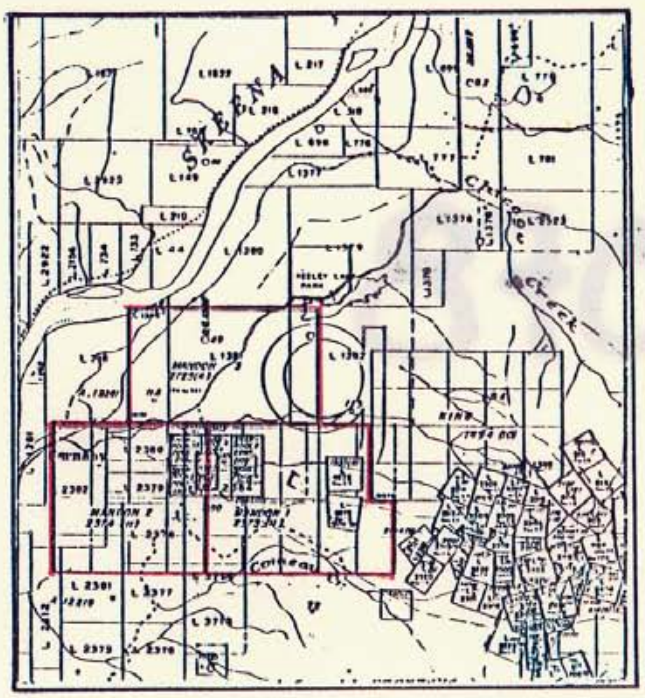
Mandon 1-3, Mandon, Huckleberry claims,
Omenica Mining Division
Latitude 55°10'N, Longitude 127°42'W, NTS 93 M/4E

AUTHORS: E. Trent Pezzot, B.Sc., Geophysicist
Glen E. White, B.Sc., P.Eng.,
Consulting Geophysicist

DATE OF WORK: November 14, 1980 - November 15, 1980

DATE OF REPORT: December 17, 1980



# COBRE EXPLORATION LIMITED

## MANDON PROJECT

LOCATION AND CLAIMS MAP

WESTERN GEOPHYSICAL AERO DATA LTD.

FIG. 1

C O N T E N T S

ILLUSTRATIONS

## INTRODUCTION

On November 14 and 15, 1980 Western Geophysical Aero Data Ltd. conducted an airborne VLF - Electromagnetometer and magnetometer survey over a 240 kilometer grid on the Cobre Exploration Limited Mandon Project in central B.C. The purpose of the survey was to locate any anomalous electromagnetic or magnetic responses which might originate from similiar geological eviron-ments to those associated with known copper and zinc occurances in the area.

## PROPERTY

The claims covered by this survey are listed below and illustrated on Figure 1.

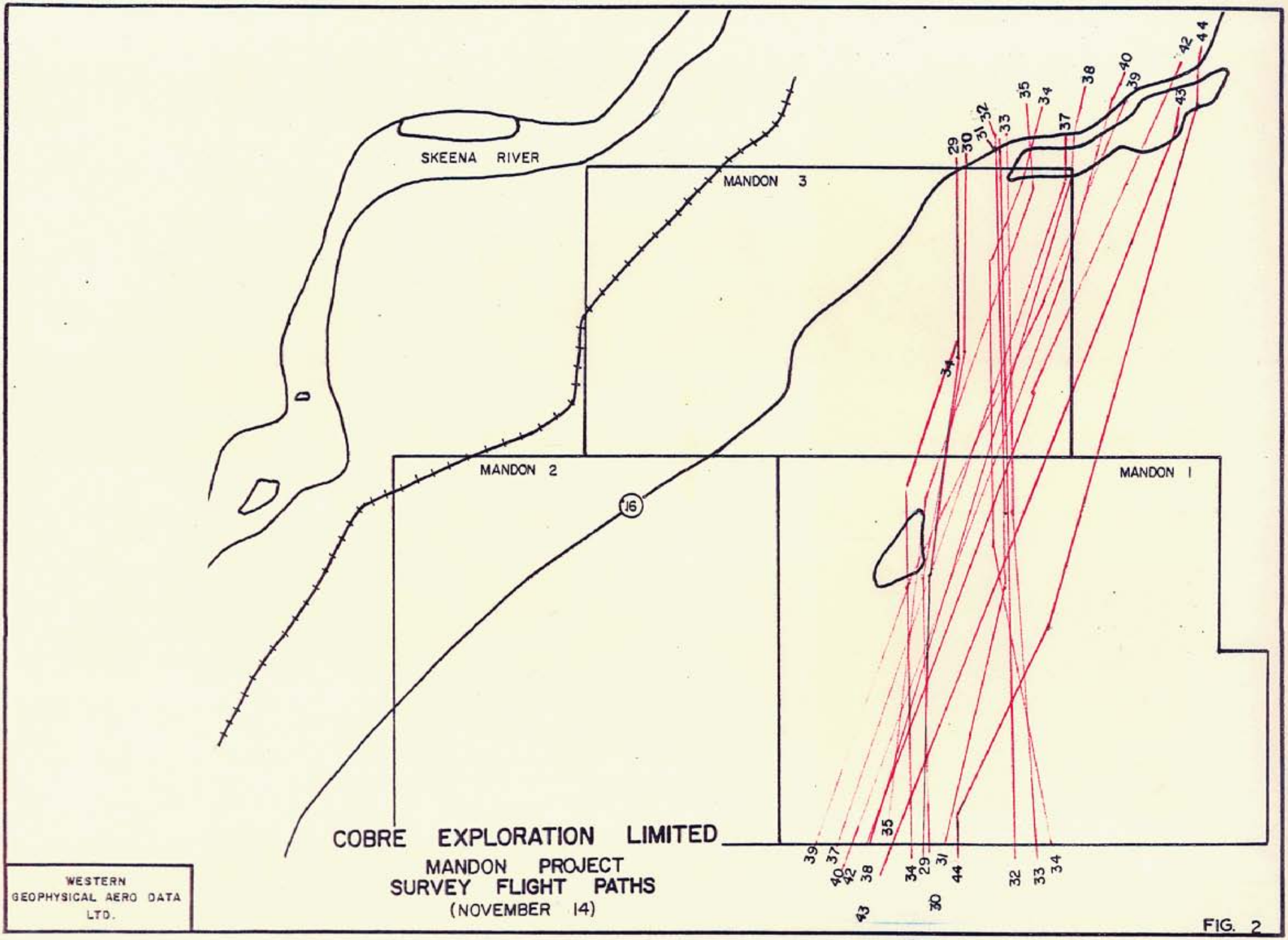
| Claim Name | Record Number | Lot Number |
|---|---|---|
| Mandon 1-3 | 2373-2374 & 2725 | |
| Mandon | 1933 | 4273 |
| Huckleberry | 1934 | 4272 |

## LOCATION AND ACCESS

As illustrated on Figure 1 the survey area is lo-cated immediately south of the Skeena River approxi-mately 10 Km southwest of Hazelton, B.C. at Latitude 55°10'N and Longitude 127°42'W in the Omenica Mining Division. Ground access to the survey area is avail-able via B.C. Highway #16 which extends across the property. Unimproved roads provide access to various locations within the grid area.

## PREVIOUS WORK

Copies of two geophysical survey reports were made available to the authors at this time. They in-


SKEENA RIVER
MANDON 3
MANDON 2
MANDON 1
16
COBRE EXPLORATION LIMITED
MANDON PROJECT
SURVEY FLIGHT PATHS
(NOVEMBER 14)
WESTERN
GEOPHYSICAL AERO DATA
LTD.
FIG. 2

clude an Induced Polarization and Magnetometer survey report by Jon G. Baird, B.Sc., P.Eng. dated October 13, 1970 and the Department of Mines and Petroleum Resources Assessment report number 3463 dated December 22, 1971 written by Peter J. Fominoff, B.A.Sc. on an induced polarization survey. It is also evident that some geochemical sampling and exploratory diamond drilling has also been completed however specific results from this work have not been provided to the authors.

## LOCAL GEOLOGY

The following geological description has been reproduced from the Assessment Report number 3463 described above:

"... the northwest portion of the grid area is seen to be covered by drift and alluvium. The southeastern part of the grid is underlain by the Upper Jurassic Brian Boru formation consisting of andesitic flows and volcanic sediments. The eastern central edge of the property is underlain by sediments of the Red Rose formation consisting mainly of greywacke shale and siltstone. A fault is thought to cross the property diagonally from the southeastern corner to the northwestern corner.

An intrusive outcrop of quartz diorite occurs about 600 feet north of the northern edge of Denys Lake. Sulphide mineralization, mainly pyrite and chalcopyrite is known to occur within the intrusive. Diamond drilling near the intrusive has confirmed the presence of pyrite and chalcopyrite. ..."

## SURVEY GRID

A survey grid composed of 54 north - south and 7 east - west lines totalling 240 Km in length were laid out by Dr. F.B. Whiting to cover the property described above. The survey was partially flown on November 14, 1980 but weather conditions restricted

vision in the area and on November 15, 1980 the entire grid was resurveyed. The flight paths followed during the first days' survery are illustrated on Figure 2. Only the flight lines flown on November 15 are illustrated on the main interpretation map Figure 3 although both days' surveys were used to formulate the interpretation.

AIRBORNE VLF-ELECTROMAGNETIC AND MAGNETIC SURVEY

This survey system simultaneously monitors and records the output signal from a proton precession magnetometer and two VLF-EM receivers installed in a bird designed to be towed 50 feet below a helicopter. A gimbal and shock mounted TV camera, fixed to the helicopter skid, provides input signal to a video cassette recorder allowing for accurate flight path recovery by correlation between the flight path cassette and air photographs of the survey area. A Bonzer radar altimeter allows the pilot to continually monitor and control terrain clearance along any flight path.

Continuous measurements of the earth's total magnetic field intensity and of the total horizontal VLF-EM field strength of two transmission frequencies are stored in two independent modes: an analogue strip chart recorder and a digital video recovery system. A three-pen analogue power recorder provides direct, unfiltered recordings of the three geophysical instrument output signals. Correlation between the strip chart and the video flight path recovery tape is controlled via fiducial marks common to both systems. The magnetic and electromagnetic data is also processed through the onboard micro-computer, incorporating an analogue to digital converter and a character generator, then superimposed along with real time and terrain clearance upon the actual flight path video recording to allow exact correlation between geophysical data and ground location. An optional time-averaging filter of 1, 2 , 3, 4 or 5 seconds is available on the VLF-EM data to provide more easily contourable values in noisy areas. The continuous input magnetic signal is processed at the maximum A/D converter rate, averaged and updated on the video display every second. Line identification, flight direction and pertinent survey information are recorded on the audio track of the video recording tape.

DISCUSSION OF RESULTS

I MAGNETIC SURVEY

Both days' surveys display extreme magnetic noise across the north-western portion of the survey grid in the vicinity of highway 16 and sporatically across the remainder of the grid. The source of this noise is likely the high voltage power lines following the highway and branch lines extending service to the farm buildings in the area. High noise areas were surveyed with a 3 second magnetometer pulse repitition rate in order to filter the observed noise (Figure 4). A one second pulse was employed whenever the noise was reduced to a level which allowed for repeatable data acquisition.

The magnetic data is presented in contour form over a photomosaic base map of the survey area as interpretation map Figure 3. The relative total field intensity values are contoured in 40 gamma intervals and the total earth's magnetic field intensity can be derived by adding 58,000 gammas to any contour value listed.

The magnetic data defines a broad 50 gamma high which extends across the property from the centre of line 1 E to line 20 E. (Figure 5) The axis of this trend is displaced approximately 400 meters south between lines 20 E and 21 E. From this location the magnetic high trends north-east and pinches out by line 47 E. The northern flank of this trend becomes increasingly steep east of line 33 E infering that a gradational or sloping geological contact either originates or comes nearer the surface at this point. Occassional magnetic lows are observed along this flank (Figure 6). The southern flank of this feature gradually disappears

east from line 33 E and by line 44 E displays a gradual field strength increase infering the presence of a gradational geological contact zone which roughly parallels the north-south survey lines between lines 1 N and 6 N then extends north-east, north of line 6 N.

A second magnetic high trend is observed in the south-east quadrant of the grid between lines 28 E and 43 E inclusive in the vicinity of line 2 N. This feature displays magnetic lows along its' northern peripheral which are similiar in character and amplitude to many of the noise spikes observed sporatically across the grid (Figure 7). Two closed magnetic highs occuring between lines 38 E and 44 E appear to be part of this general trend. A third closed high on the eastern end of line 2 N is along strike but appears to be a separate feature related to the gradational or sloping geological contact interpretted to the east. A ground magnetic survey reported on in October, 1970 located a magnetic dipole in the vicinity of lines 31 E and 32 E between tie lines 2 N and 3 N and a magnetic high near the intersection of lines 36 E and 2 N. It appears that these anomalies are part of a larger trend as shown by this latest survey.

## II VLF-EM SURVEY

Two VLF-electromagnetic transmission frequencies were monitored during this survey, Seattle, Washington (18.6 Khz) and Annapolis, Maryland (21.4 Khz), providing data from two nearly orthagonal electromagnetic signal directions allowing the energization of conductive zones of varying strike. Anomalous electromagnetic responses are noted on the interpretation map (Figure 3) as per-

cent total horizontal field intensity above local background values. The sensitivity of the electromagnetic field strength with respect to terrain clearance negates any direct comparasin of absolute field measurments across a large survey area without extensive and complex terrain clearance corrections. A sinusoidal background signal observed in the data is directly correlated to a pendulanic oscillation of the towed receiver bird. This action is precipitated as the helicopter changes speed and/or direction either at the end of a survey line or in areas of severe topographic relief. The period of oscillation is set by the length of the towing cable and is observed to be both in theoretical and measured estimates approximately 7.8 seconds. This periodic swinging induces an attitude change in the receiver coils as the bird dips up and down. The amplitude and period of the induced near sinusoidal signal is directly correlated to the excursions of the receiver coils about the horizontal plane.

A number of VLF-EM trends are observed which by their high spatial frequency appear to originate from a number of small irregularly spaced and shaped conductive zones. One of the stronger responses extends from line 28 E to 43 E, coincident or slightly offset from a magnetic trend described above. This anomaly is best illustrated by line 38 E as a Seattle frequency, 24% field strength increase above local background values (Figure 8). This trend was also observed on data gathered from the first days' survey, as shown on line 43 E (Figure 9) and on the Annapolis frequency data from tie line 2 N (Figure 10). Unfortunately this anomalous trend occurs near a topographic ridge and most of the VLF-EM measurements are interferred with by both terrain clearance effects (illustrated best on the Annapolis data) and by receiver oscillation

(illustrated best on the Seattle data) as shown on Figure 7. A detailing ground electromagnetic survey conducted over the zone illustrated on the interpretation map Figure 3 should delineate individual conductors in what is likely a complex zone of small, near surface conductive sheets or lenses.

To the south-west along strike from the above described zone, lines 20 E to 24 E inclusive provide weak indications of another VLF-EM trend. The response is possibly due to oscillation of the receiver and in the absence of any encouraging geological, geochemical or other geophysical evidence should be given a low priority for followup surveying.

Two zones immediately west of Denys Lake illustrate high electromagnetic trends. The weaker zone is observed as a 16% Seattle field strength increase on lines 24 E and 25 E, coincident with the axis of the magnetic trend, approximately 200 meters west of Denys Lake (Figure 11). Past geophysical surveys revealed a magnetic dipole and zones of high chargeability in the area. Diamond drilling revealed the source of the chargeability anomalies as disseminated pyrite and chalcopyrite. The stronger VLF-EM anomaly is located 500 meters west of Denys Lake and occurs across lines 20 E, 21 E and 22 E (Figure 12) on the Seattle frequency. The zone is coincident with the 400 meter displacement of the magnetic trend axis between lines 20 E and 21 E. It is likely the magnetic and electomagnetic responses reflect a north-south trending right-lateral fault. The associated conductivity could be related to either the fault plane or increased metallic element content in the area. The zone warrants investigation by a detailing ground electromagnetic survey.

Very weak indications of a high VLF-EM trend are observed between lines 37 E and 41 E along tie line 5 N on both the Seattle and the Annapolis monitors (Figure 13). The response is likely a result of receiver oscillation but does coincide with an induced polarization defined resistivity low trend at line 37 E.

A relatively strong VLF-EM contact trend roughly parallels highway 16 between lines 23 E and 33 E (Figure 14). The response possibly defines a geological contact but more likely originates from the power lines following the highway and service lines to farm buildings in the area.

Isolated, one or two line, VLF-EM anomalies are observed at random locations across the grid and warrant a cursory ground investigation. A 45% field intensity increase and an offsetting 20% increase are observed on the Annapolis monitor on line 1 N immediately south of line 17 E (Figure 15). A Seattle frequency 30% increase is observed on the south end of line 25 E, approximately 100 meters south of the map sheet (Figure 16). A questionable 10% increase is observed on the Seattle frequency on the north end of line 6 E. (Figure 17) This anomaly occurs across a cleared field and in the vicinity of farm buildings.

Streams, marshes, paved roadways, railroad tracks, powerlines, farm buildings etc. often generate isolated, narrow VLF-EM field increases. The Annapolis spikes on line 2 E across Highway 16 and the railroad tracks to the north (Figure 18) and the Seattle frequency anomaly across a float plane on line 43 (Figure 19) illustrate such responses. Isolated VLF-EM anomalies which do not correlate with observed cultural or geomorphic

features occur at the following locations:

1) Line 48 E - east of line 2 N (Figure 20)
2) Line 44 E - 47 E - south of line 4 N (Figure 21)
3) Line 46 E - north of line 1 N (Figure 21)
4) Line 45 E - midway between lines 2 N and 3 N (Figure 22)
5) At the intersection of lines 41 E and 5 N (Figure 23)
6) At the intersection of lines 29 E and 5 N (Figure 23)
7) North end of line 4 E (Figure 24)

These features are weak and narrow but should be examined if any encouraging evidence is available.

## SUMMARY AND RECOMMENDATIONS

On November 14 and 15, 1980 Western Geophysical Aero Data Limited conducted an airborne VLF-EM and magnetometer survey over a 240 Km. grid covering Cobre Exploration Limited's Mandon properties in north-central B.C.

The survey delineated a gentle magnetic high trend presently considered open to the west and pinching out in the north-east quadrant of the grid area. A discontinuity and strike change of the central axis of this trend suggests the presence of a north-south right lateral fault approximately 500 meters west of Denys Lake. A smaller magnetic trend, weakly dipolar in nature, is present in the south-east quadrant of the grid.

A VLF-EM defined conductive trend is coincident with the smaller magnetic feature and likely represents an area of small, near surface conductive faults or irregularly spaced lenses. VLF-EM trends are also observed in two separate locations due west of Denys Lake. One zone ties to a known area of disseminated pyrite and chalcopyrite and the other to the interpretted fault described above. These trends warrant further work in the form of detailing ground surveys.

Two isolated VLF-EM anomalies, one on line 1 N and the other on line 25 E are of sufficient amplitude

and size to warrant a ground inspection.

Other isolated VLF-EM high amplitude spikes listed in the text of this report are similiar in character to noise spikes correlated to cultural features and should be given lower priority for further examination.

Respectfully submitted:
GLEN E. WHITE GEOPHYSICAL
CONSULTING & SERVICES LTD.

E. Trent Prescott, B.Sc.

Glen E. White, B.Sc. P.Eng.
Consulting Geophysicist

## Instrument Specifications

### SABRE AIRBORNE MAGNETOMETER

| | |
|---|---|
| Type: | Proton Precession |
| Range: | 20,000 gammas to 75,000 gammas |
| Repetition Rate: | Approximately 1 second or 3 seconds selected by toggle switch |
| Output: | Designed to operate into any potentiometric chart recorder with 0 to 0.1 volt scale |
| Display: | Digital dial plus analogue meter |
| Period: | Meter records last 1000 $\lambda$, 2000 $\lambda$, 5000 $\lambda$, of total field depending on scale selected. Zeroing system allows chart recording pen to be positioned anywhere on paper, so that if the pen is centred, the resulting scales that can be selected are $\pm$ 500 $\lambda$, $\pm$ 1000 $\lambda$, or $\pm$ 2500 $\lambda$. These scales are standard but virtually all others can be provided. |
| REsolution: | Resolution of the instrument itself is better than 1 gamma. Ultimate resolution depends on the accuracy of the chart recorder. |
| Detector: | Kerosene filled coil approximately 9 cm x 8 cm in diameter. Inductance - 60 millihenries<br>Resistance - 7.5 ohms<br>Weight - 2.2 Kg. |
| Operating Temperature: | Instrument - $-10^{\circ}$C to $+60^{\circ}$C<br>Detector - $-40^{\circ}$C to $+60^{\circ}$C |
| Dimensions: | Instrument Console - 30 cm x 10 cm x 25 cm<br>Towed Bird - 1.7 m x 21 cm diameter |
| Weight: | Instrument Console - 3.5 Kg.<br>Towed Bird - 30 Kg.<br>(VLF-EM antennae system housed in bird with magnetometer detector) |
| Power Source: | Two 12 volt, 28 amp-hour lead acid batteries (gelled electrolyte) |

# Instrument Specifications

## SABRE AIRBORNE VLF SYSTEM

| | |
|---|---|
| Source of Primary Field: | VLF radio stations in the frequency range of 14 $KH_z$ to 30 $KH_z$. |
| Type of Measurement: | - Horizontal field strength |
| Number of Channels: | - Two; Seattle, Washington at 18.6 $KH_z$ |
| | - Annapolis, Maryland at 21.4 $KH_z$ |
| Type of Sensor: | - Two ferrite antennae arrays, one for each channel, mounted in magnetometer bird. |
| Output: | - 0 - 100 mV displayed on two analogue meters (one for each channel) |
| | - recorder output posts mounted on rear of instrument panel |
| Power Supply: | - Eight alkaline 'AA' cells in main instrument case (life 100 hours) |
| | - Two 9-volt alkaline transistor batteries in bird (life 300 hours) |
| Instrument Console: | - Dimensions - 30 cm x 10 cm x 25 cm |
| | - Weight - 3.5 Kg. |

# Instrument Specifications

## DATA RECORDING SYSTEM

### i) Chart Recorder

Type: Esterline Angus Miniservo III Bench AC Ammeter - Voltmeter Power Recorder
Model: MS 413 B
Specification: S-22719, 3-pen servo recorder
Amplifiers: Three independent isolated DC amplifiers ( 1 per channel) providing range of acceptable input signals
Chart: 10 cm calibrated width 2-fold chart
Chart Drive: Multispeed stepper motor chart drive, Type D850, with speeds of 2, 5, 10, 15, 30 and 60 cm/hr. and cm/min.
Controls: Separate front mounted slide switches for power on-off, chart drive on-off, chart speed cm/hr - cm/min. Six position chart speed selector. Individual front zero controls for each channel.
Power Requirements: 115/230 volts AC at 50/60 $H_z$ ( Approximately 30 VA)
Writing System: Disposable fibre tipped ink cartridge (variable colors)
Dimensions: 38.6 cm x 16.5 cm x 43.2 cm
Weight: 9.3 Kg.

### ii) Digital Video Recording System

Type: L.M. Microcontrols Ltd. Microprocessor Control Data Acquisition System
Model: DADG - 68
Power Requirements: 10 - 14 volts dc, Maximum 2 amps
Input Signal: 3, 0 - 100 mvolt d c signals
1, 0 - 25 volt d c signal
Microprocessor: Motorola MC-6800
CRT Controller: Motorola MC-6845
Character Generator: Motorola MCM-6670
Analogue/Digital Convertor: Intersil 7109
Multiplexer: Intersil IH 6208
Digital Clock: National MM 5318 chip
9 volt internal rechargeable nickle-cadmium battery
Fiducial Generator: internally variable time set controls relay contact and audio output
Dimensions: 30 cm x 30 cm x 13 cm
Weight: 3 Kg

# Instrument Specifications

## FLIGHT PATH RECOVERY SYSTEM

i) T.V. Camera:

Model: RCA TC2055 Vidicon
Power Supply: 12 volt dc
Lens: variable, selected on basis of expected terrain clearance
Mounting: Gimbal and shock mounted to housing
- housing bolted to helicopter skid

ii) Video Recorder:

Model: Sony SLO - 340
Power Supply: 12 volt dc / 120 volt AC (60 $H_z$)
Tape: Betamex ½" video cassette - optional length
Dimensions: 30 cm x 13 cm x 35 cm
Weight: 8.8 Kg
Audio Input: Microphone in - 60 db low impedance microphone
Video Input: 1.0 volt P-P, 75 Ω unbalanced, sync negative from camera

iii) Altimeter:

Model: Bonzer Mk 10 Radar Altimeter
Power Supply: 12 - 25 volts dc
Output: 0 - 25 volt ( 1 volt / 1000 feet ) dc signal split to microprocessor and analogue meter
Mounting: fixed to T.V. camera housing, attached to helicopter skid

## COST BREAKDOWN

| Personnel | Field Work | Office | Wages | Total |
|---|---|---|---|---|
| T.Pezzot | Nov. 14,15/80 | | 175.00 | 225.00 |
| J.Behenna | 14,15 | Dec. 3 | 175.00 | 525.00 |
| N.McGarry | 14,15 | Dec. 1,2 | 155.00 | 610.00 |
| P.Athayde | | Nov. 24-28 | 145.00 | 725.00 |

| | |
|---|---|
| Vehicle Expenses ..... | 325.00 |
| Meals and Accomodations ..... | 525.00 |
| Photomosaic & Materials ..... | 225.00 |
| Drafting and Reproduction ..... | 550.00 |
| Instrument Lease ..... | 840.00 |
| Interpretation and Report ..... | 850.00 |
| Helicopter 7.5 hrs. ..... | 3100.00 |
| Total ..... | 8500.00 |

| | |
|---|---|
| Portion Applicable to Period Nov. 14 - 26..... | $ 5,500 |
| Portion Applicable to Period Nov. 27 - Dec.17 /80... | $ 3,000 |
| | $ 8,500 |

# STATEMENT OF QUALIFICATIONS

NAME: PEZZOT, E. Trent

PROFESSION: Geophysicist - Geologist

EDUCATION: University of Brisish Columbia - B.Sc. - Honors Geophysics and Geology

PROFESSIONAL ASSOCIATIONS: Society of Exploration Geophysicists

EXPERIENCE: Three years undergraduate work in geology - Geological Survey of Canada, consultants.

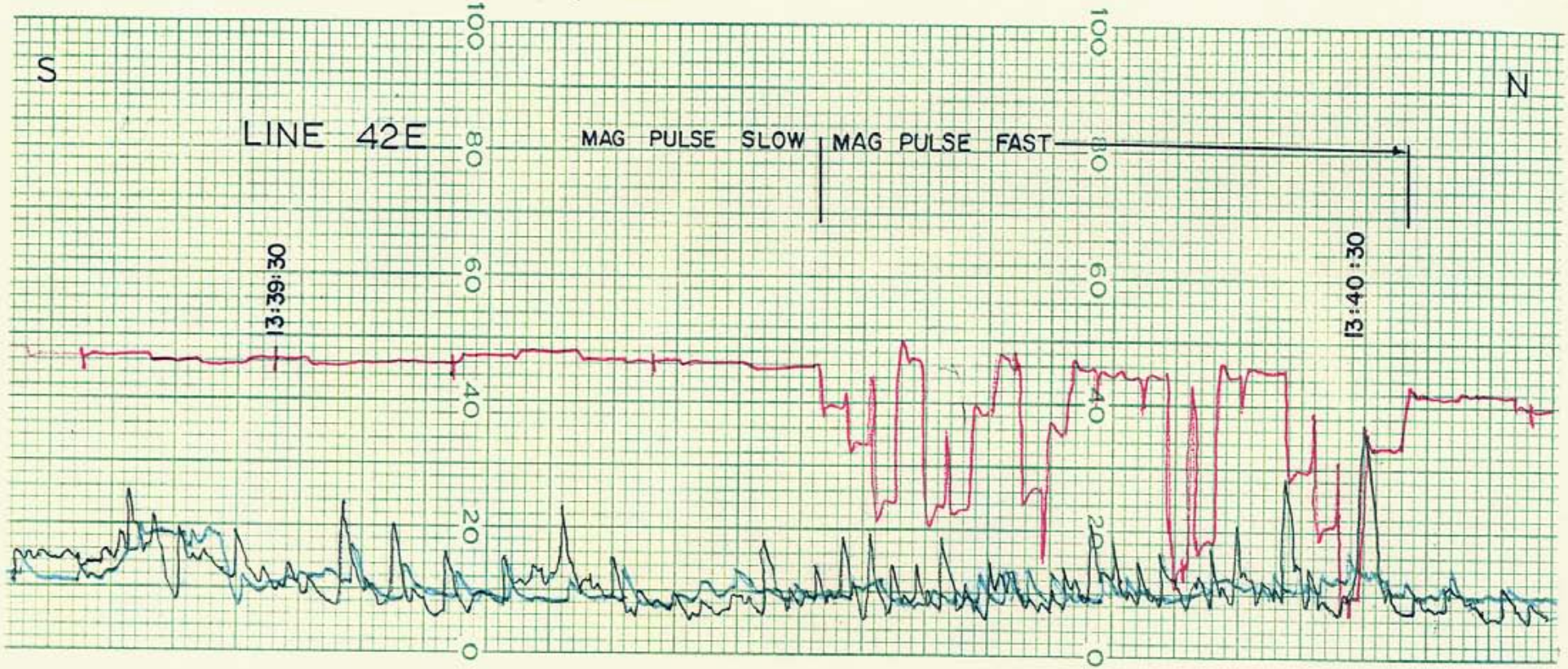
Three years Petroleum Geophysicist, Senior Grade, Amoco Canada Petroleum Co. Ltd.

Two years consulting geophysicist, Consulting geologist - B.C., Alberta, Saskatchewan, N.W.T., Yukon, western U.S.A.

Two years geophysicist with Glen E. White Geophysical Consulting & Services Ltd.

## STATEMENT OF QUALIFICATIONS

| | |
|---|---|
| NAME: | WHITE, Glen E., P.Eng. |
| PROFESSION: | Geophysicist |
| EDUCATION: | B.Sc. Geophysics - Geology<br>University of British Columbia |
| PROFESSIONAL ASSOCIATIONS: | Registered Professional Engineer, Province of British Columbia |
| | Associate member of Society of Exploration Geophysicists. |
| | Past President of B.C. Society of Mining Geophysicists |
| EXPERIENCE: | Pre-Graduate experience in Geology - Geochemistry - Geophysics with Anaconda American Brass |
| | Two years Mining Geophysicist with Sulmac Exploration Ltd. and Airborne Geophysics with Spartan Air Services Ltd. |
| | One year Mining Geophysicist and Technical Sales Manager in the Pacific north-west for W. P. McGill and Associates |
| | Two years Mining Geophysicist and supervisor Airborne and Ground Geophysical Divisions with Geo-X Surveys Ltd. |
| | Two years Chief Geophysicist Tri-Con Exploration Surveys Ltd. |
| | Ten years Consulting Geophysicist |
| | Active experience in all Geologic provinces of Canada |




# COBRE EXPLORATION LIMITED

## MANDON PROJECT

WESTERN GEOPHYSICAL AERO DATA LTD.

MAGNETOMETER : VERTICAL SCALE 1 cm = 200 gammas
VLF-EM : VERTICAL SCALE 1 cm = 10%

MAGNETOMETER : RED
VLF-EM (SEATTLE) : BLUE
VLF-EM (ANNAPOLIS) : BLACK

FIG. 4


# COBRE EXPLORATION LIMITED

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VLF-EM (ANNAPOLIS) : BLACK

FIG. 5

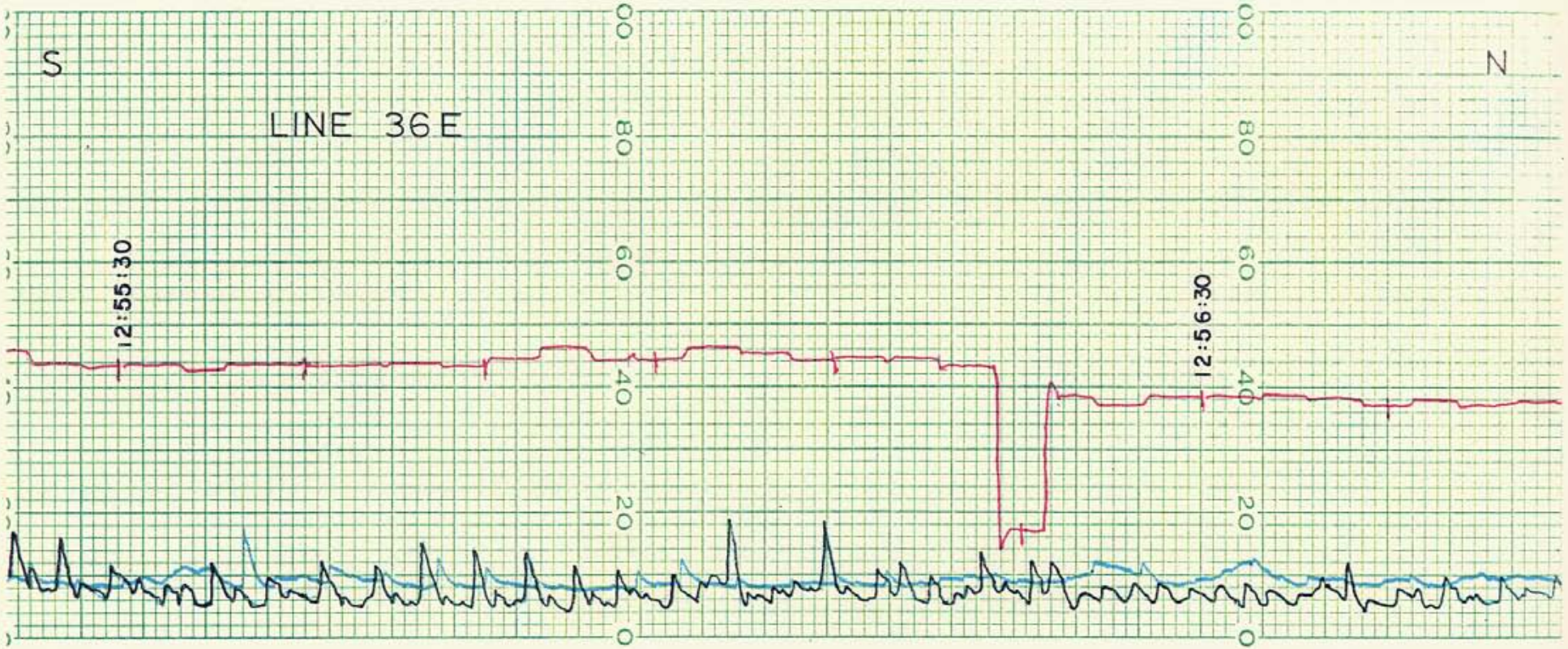


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FIG. 6

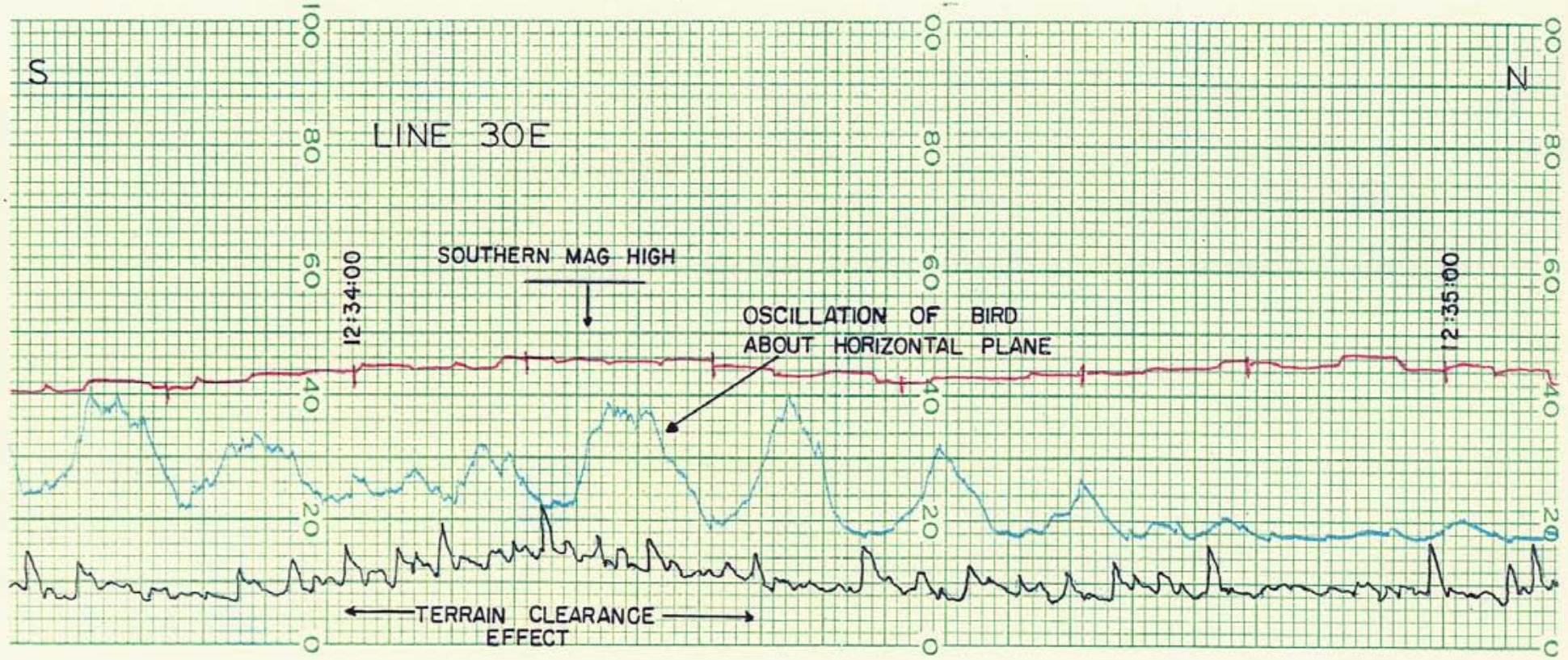


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FIG. 7

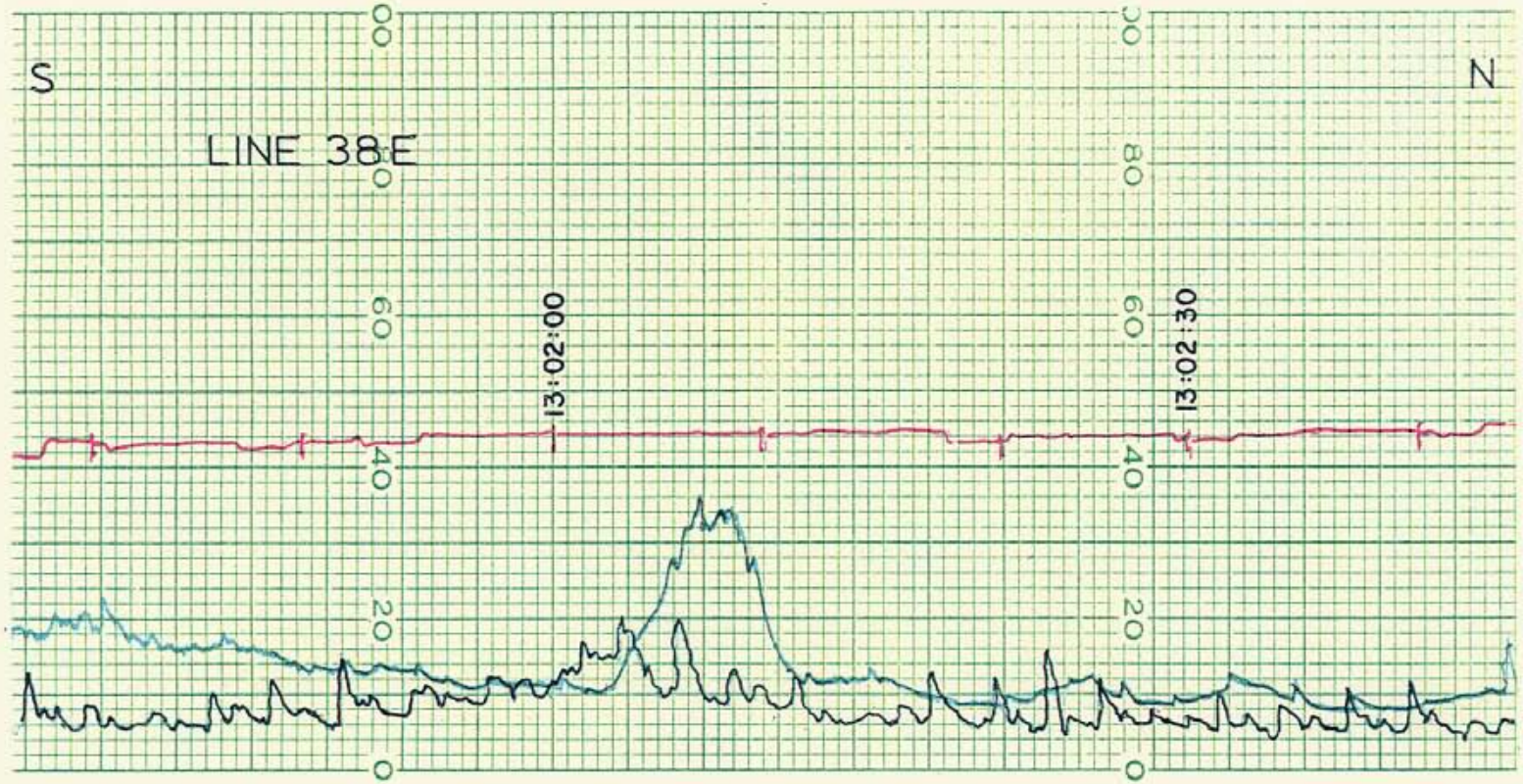


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FIG. 8

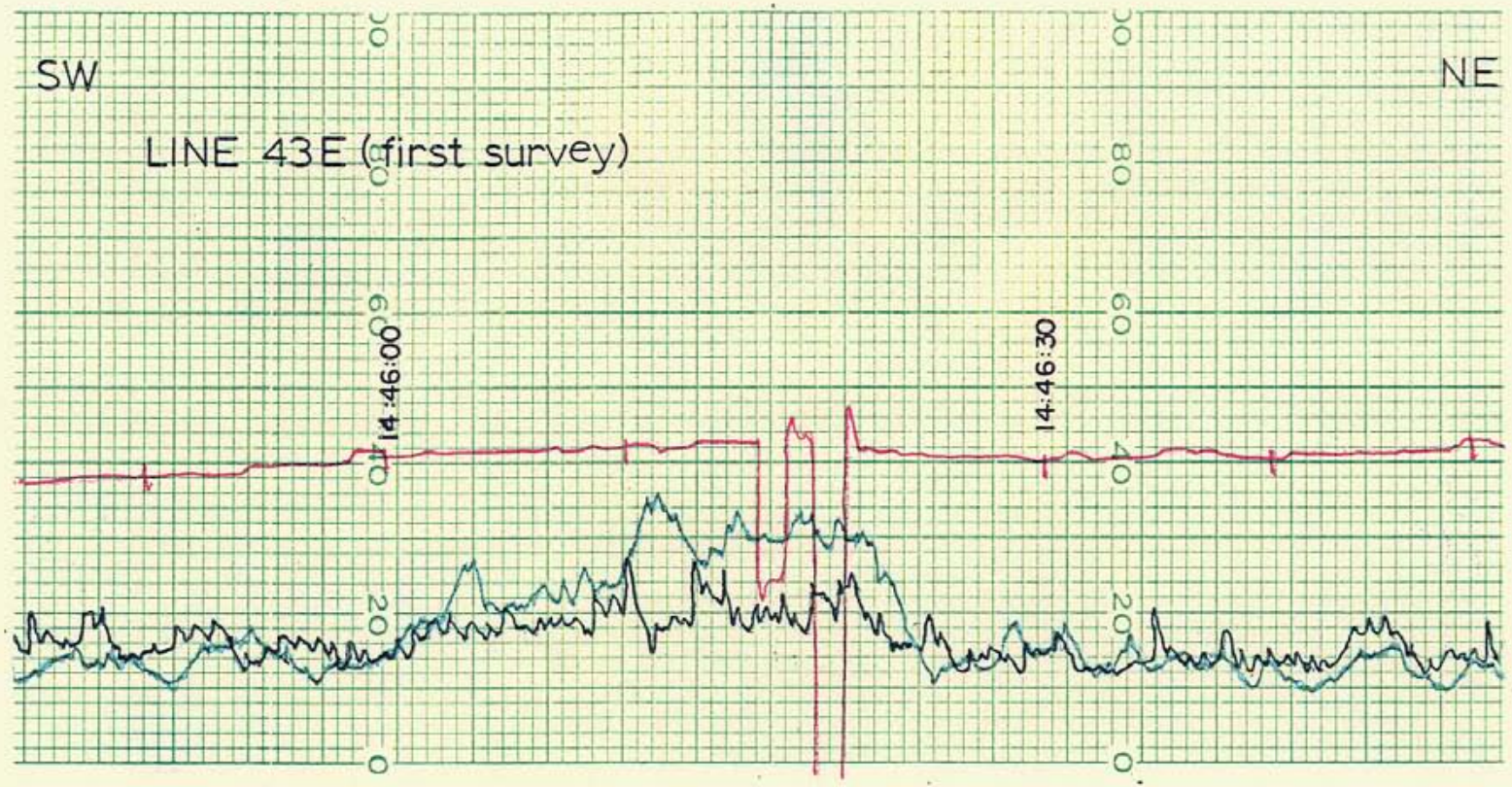


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FIG. 9

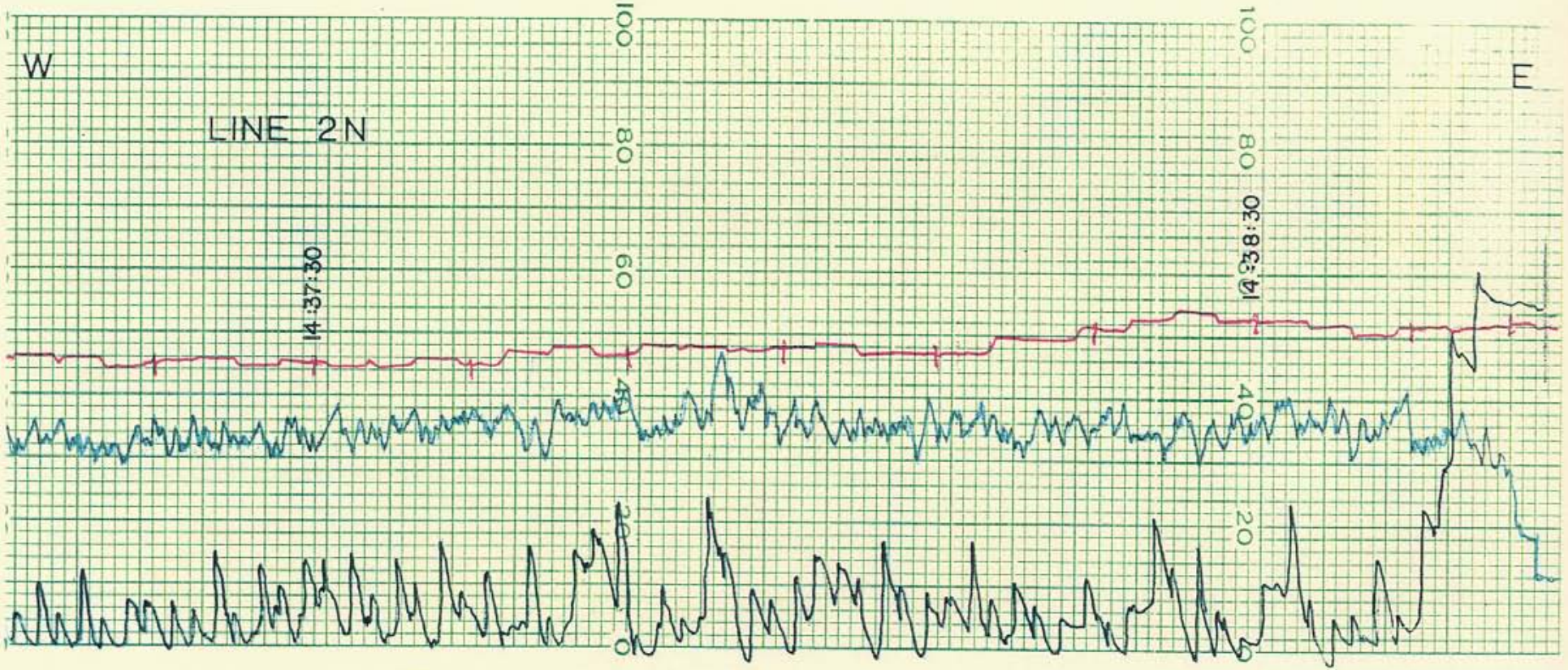


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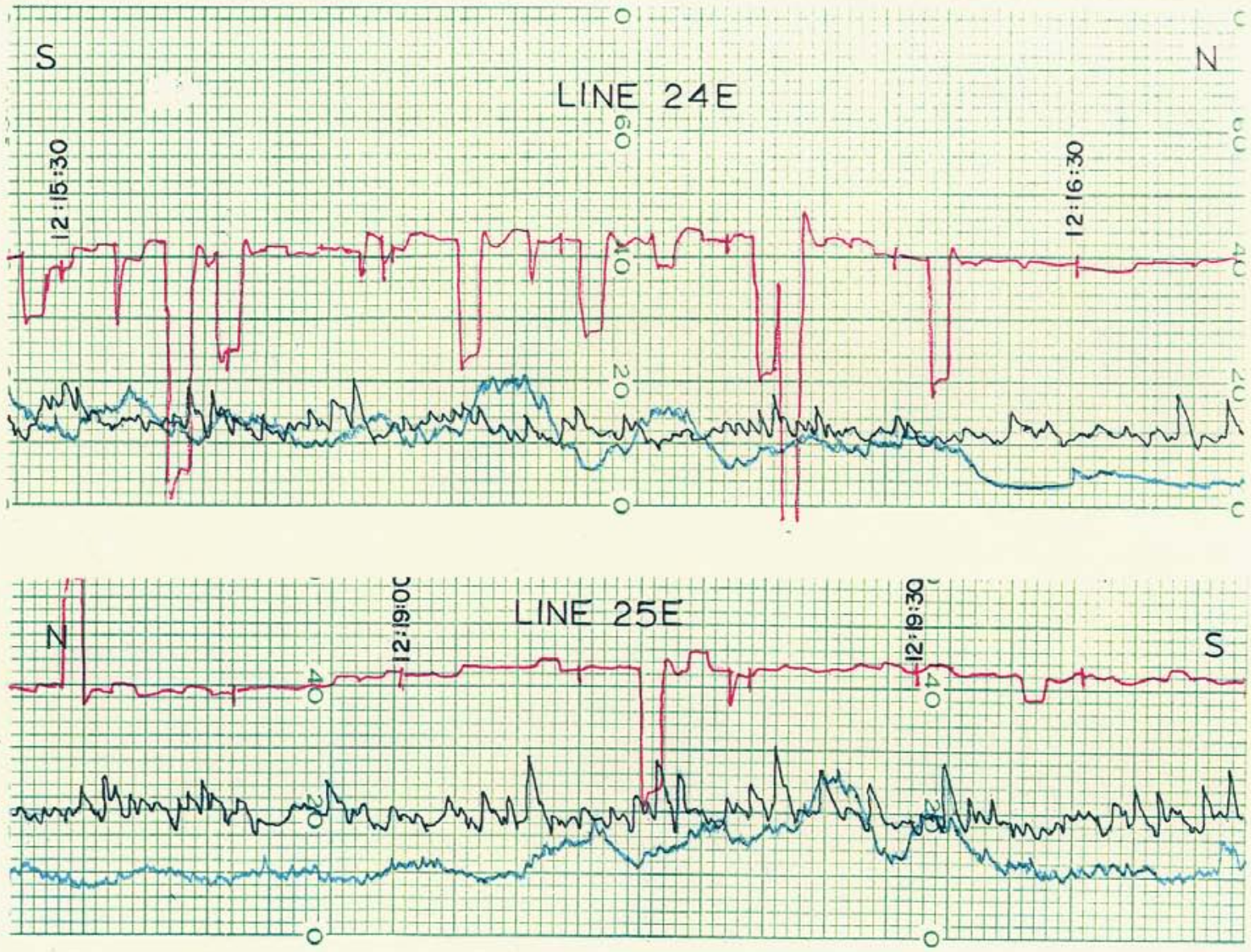
FIG. 10

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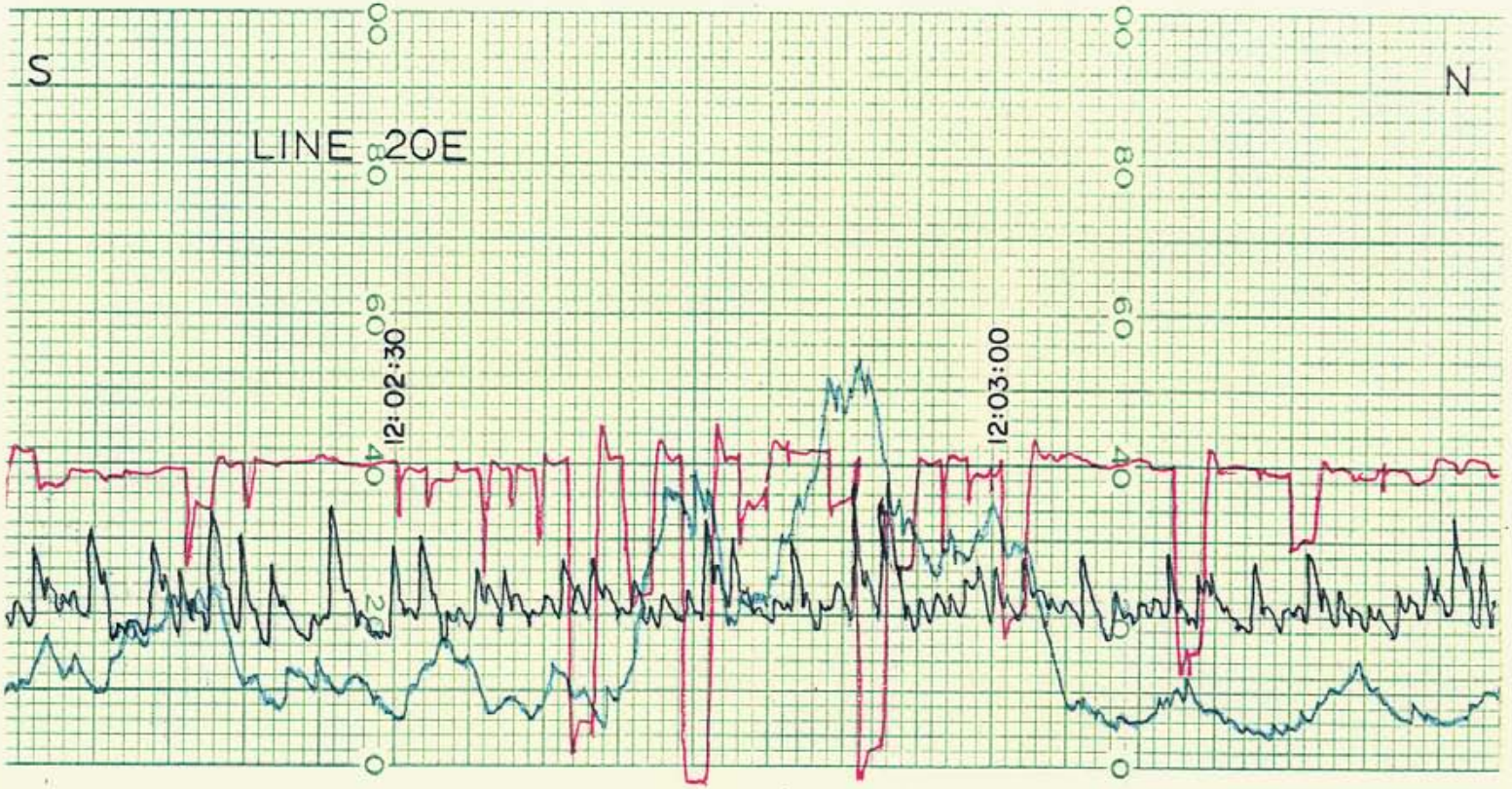
VLF - EM (ANNAPOLIS) : BLACK

FIG. 11




# COBRE EXPLORATION LIMITED

## MANDON PROJECT

WESTERN GEOPHYSICAL AERO DATA LTD.

MAGNETOMETER : VERTICAL SCALE 1 cm = 200 gammas
VLF-EM : VERTICAL SCALE 1 cm = 10%

MAGNETOMETER : RED
VLF-EM (SEATTLE) : BLUE
VLF-EM (ANNAPOLIS) : BLACK

FIG. 12


# COBRE EXPLORATION LIMITED

## MANDON PROJECT

WESTERN GEOPHYSICAL AERO DATA LTD.

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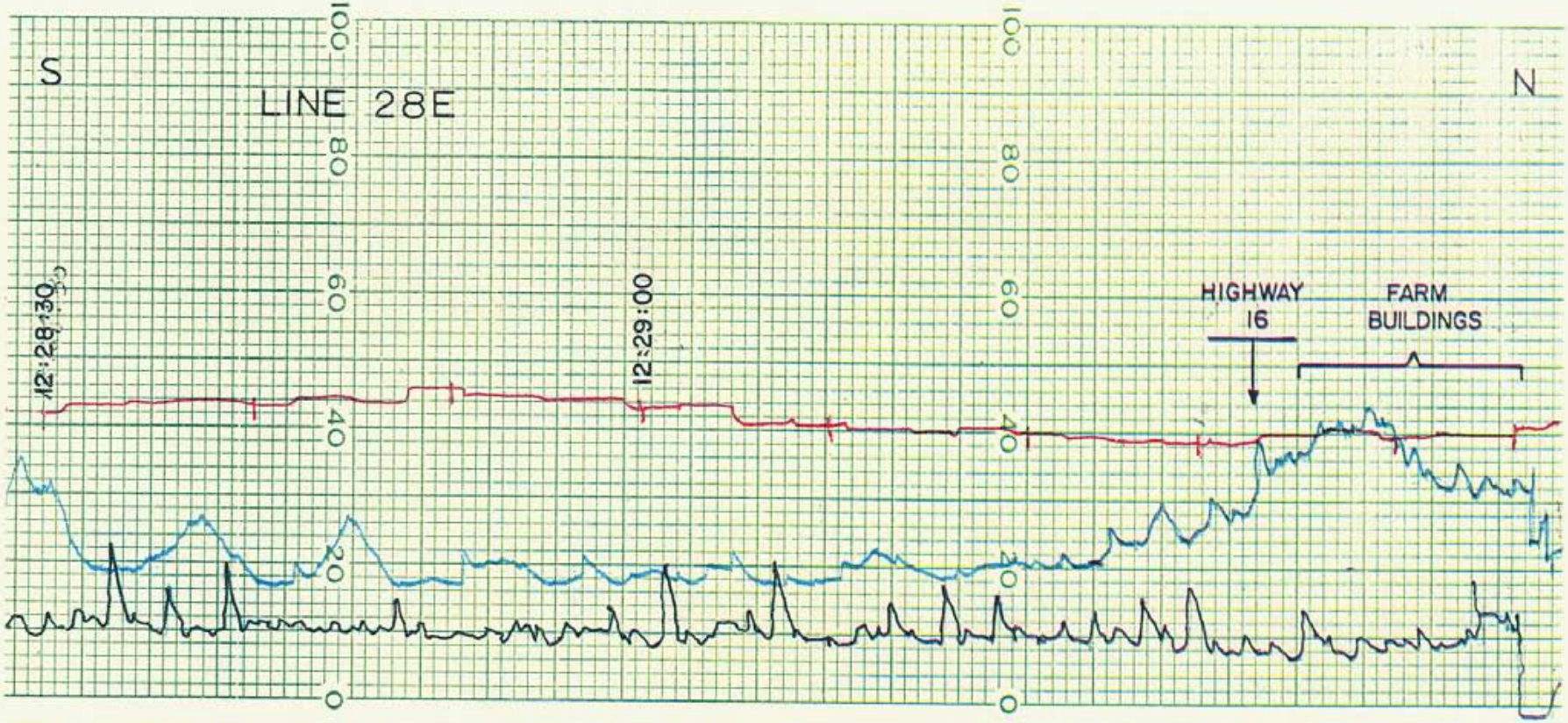
VLF-EM : VERTICAL SCALE 1 cm = 10%

MAGNETOMETER : RED
VLF-EM (SEATTLE) : BLUE
VLF-EM (ANNAPOLIS) : BLACK

FIG. 13

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## MANDON PROJECT

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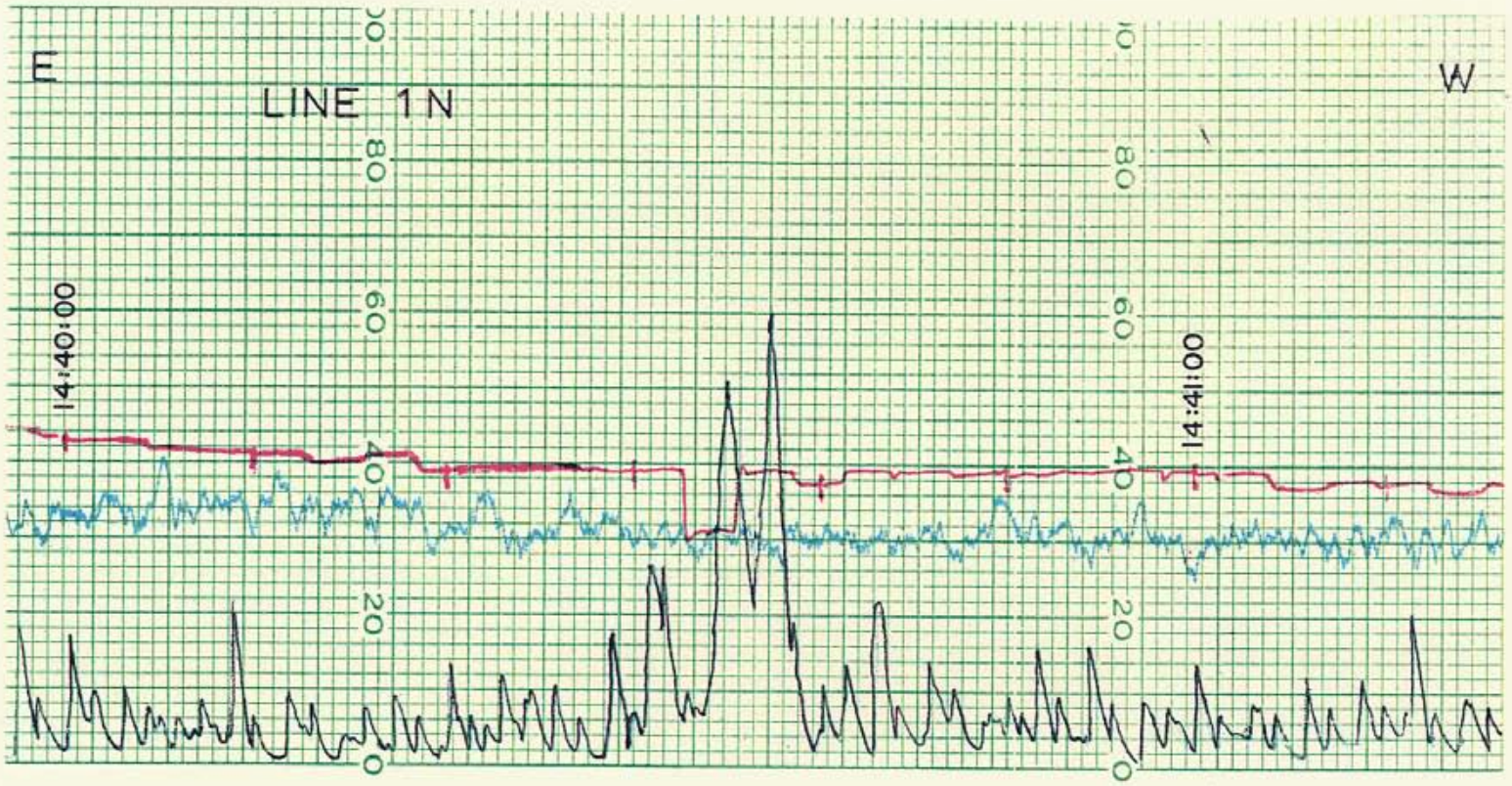
VLF - EM (SEATTLE) : BLUE
VLF - EM (ANNAPOLIS) : BLACK

FIG. 14

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MAGNETOMETER : RED
VLF - EM (SEATTLE) : BLUE
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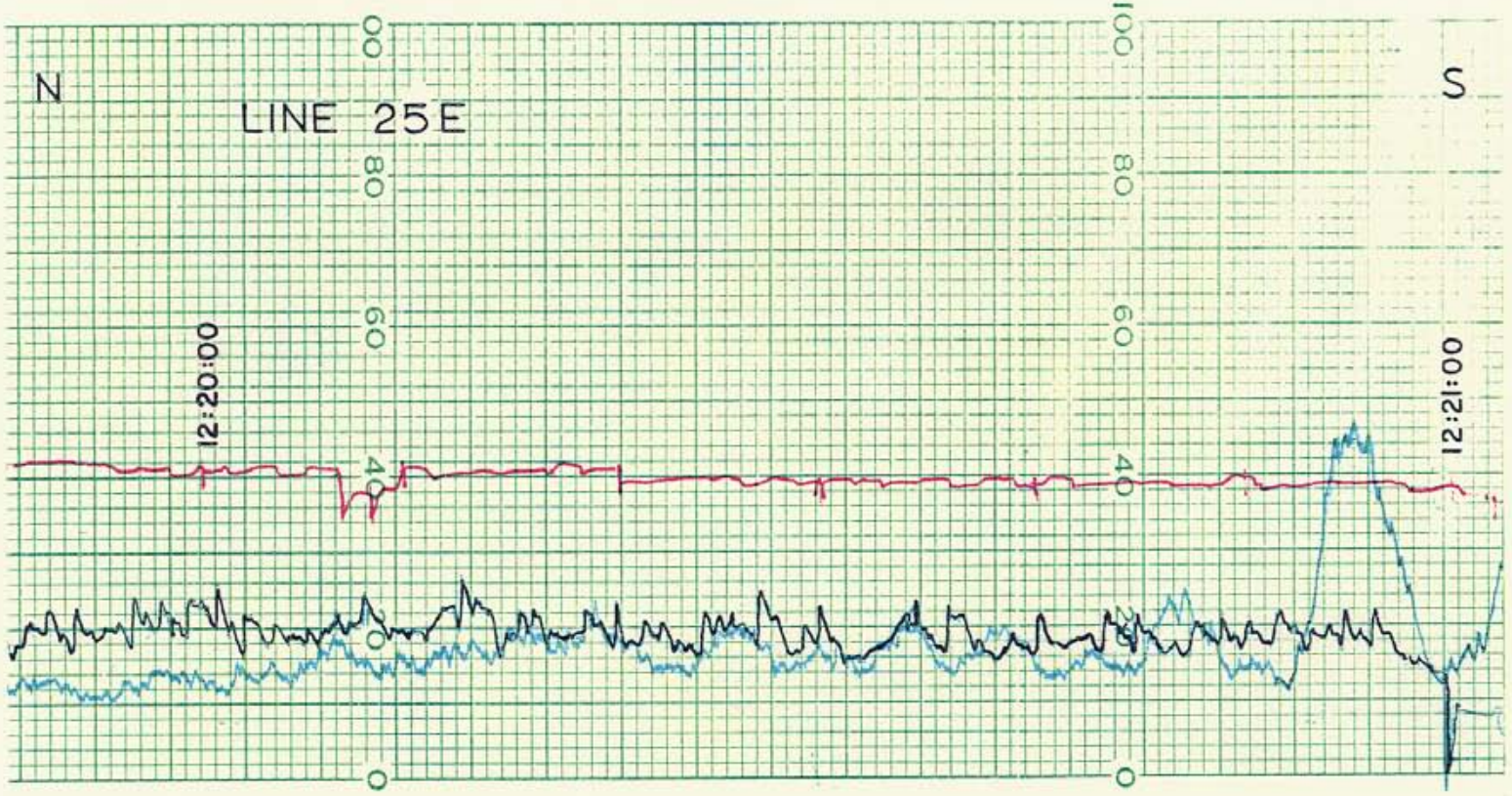
FIG. 15

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## MANDON PROJECT

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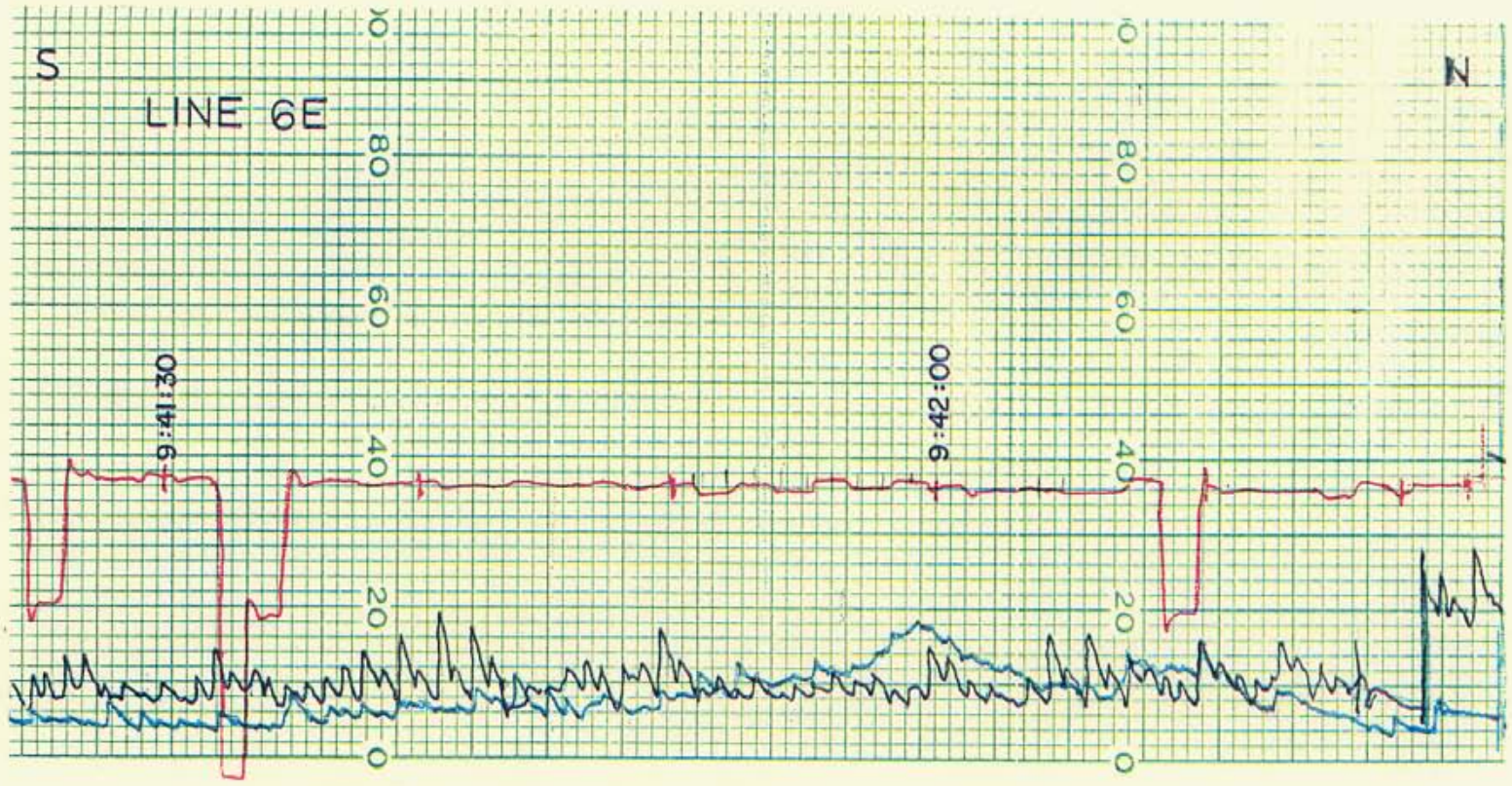
MAGNETOMETER : RED
VLF-EM (SEATTLE) : BLUE
VLF-EM (ANNAPOLIS) : BLACK

FIG. 16

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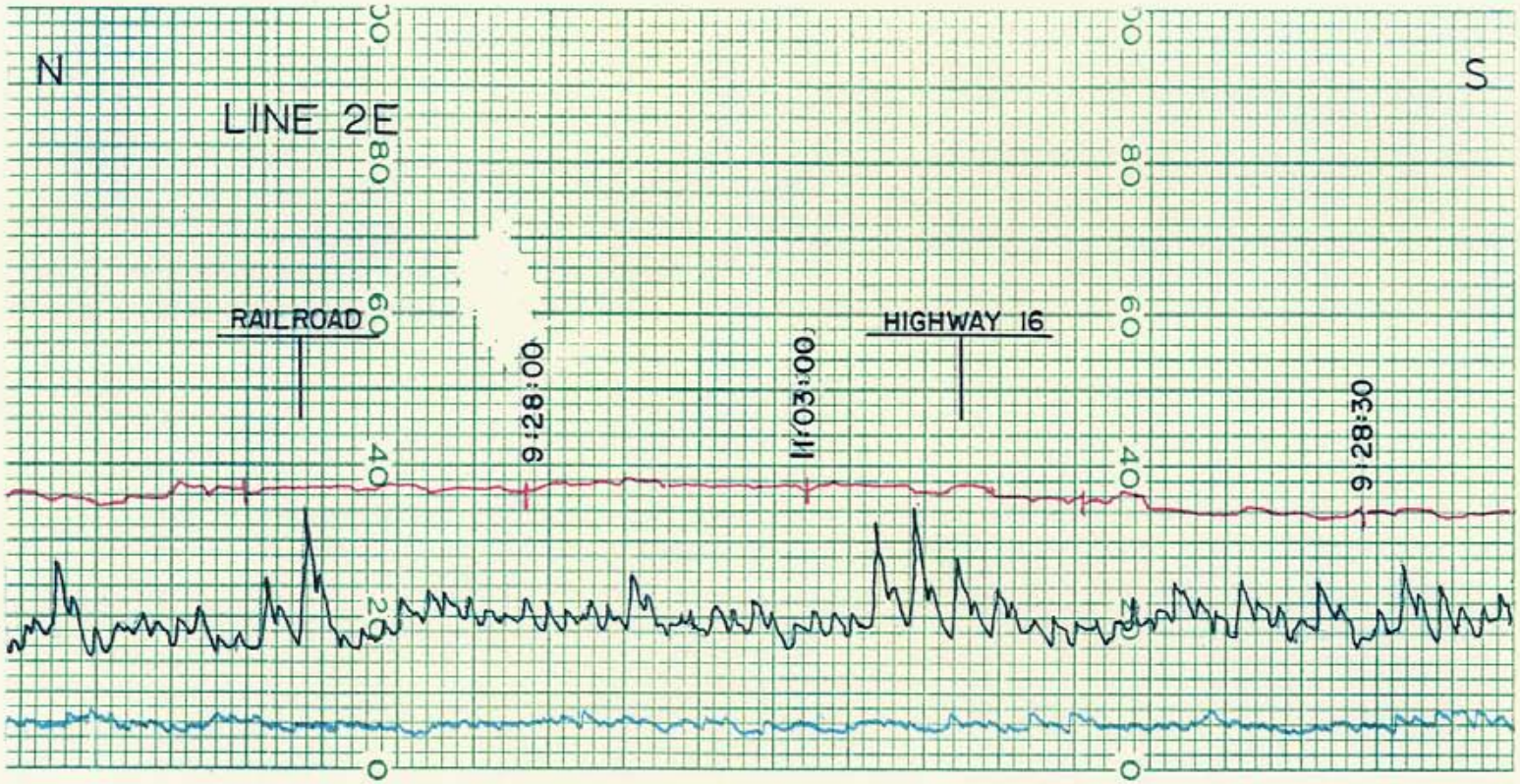
VLF-EM (SEATTLE) : BLUE
VLF-EM (ANNAPOLIS) : BLACK

FIG. 17

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## MANDON PROJECT

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VLF-EM (SEATTLE) : BLUE
VLF-EM (ANNAPOLIS) : BLACK

FIG. 18

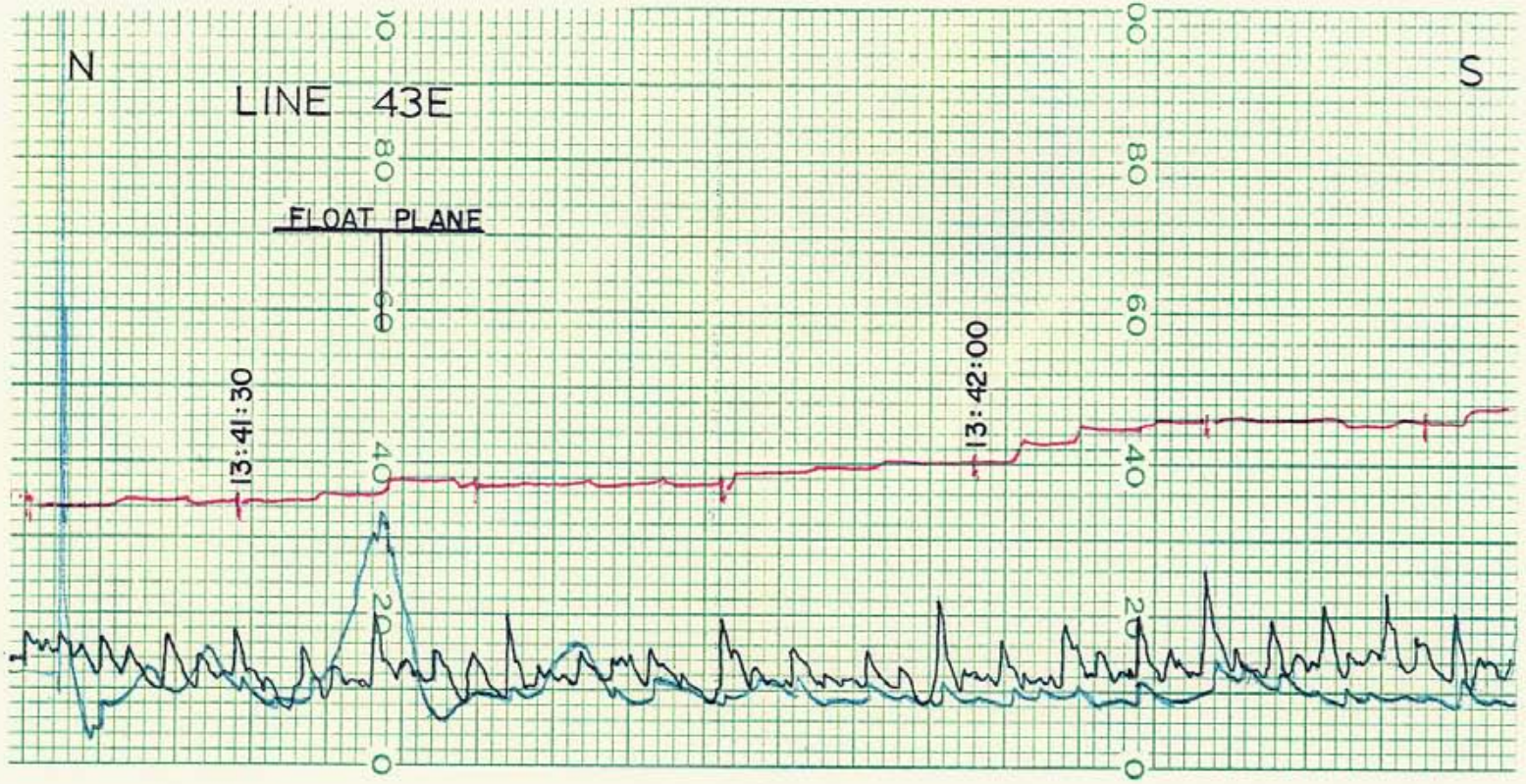


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FIG. 19

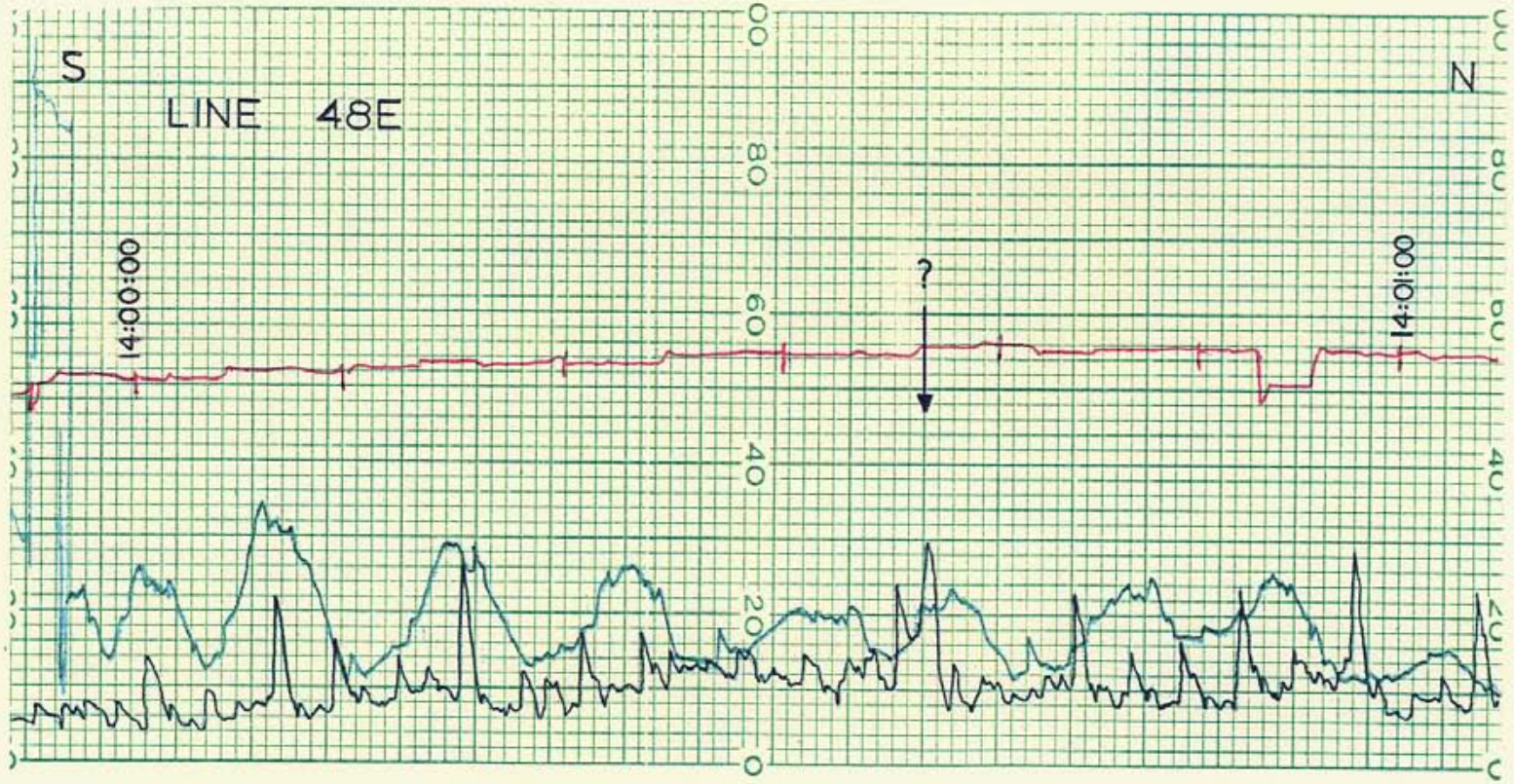


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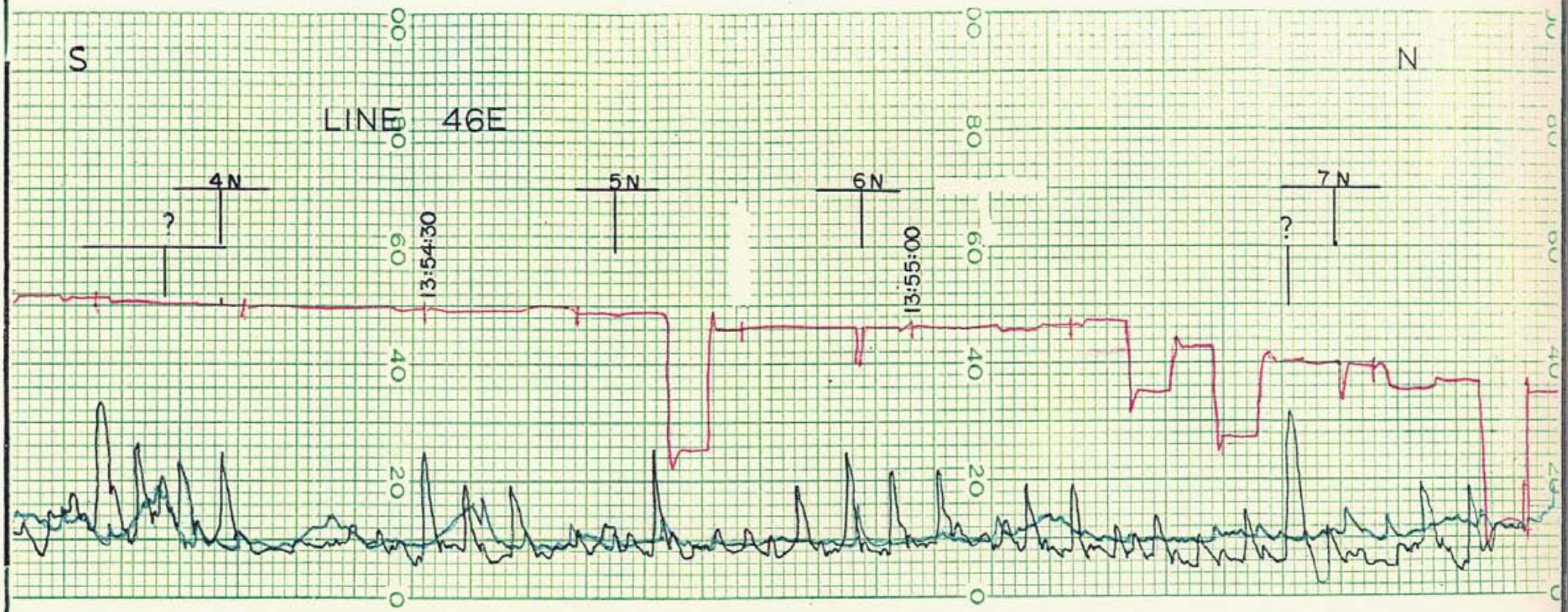
FIG. 20

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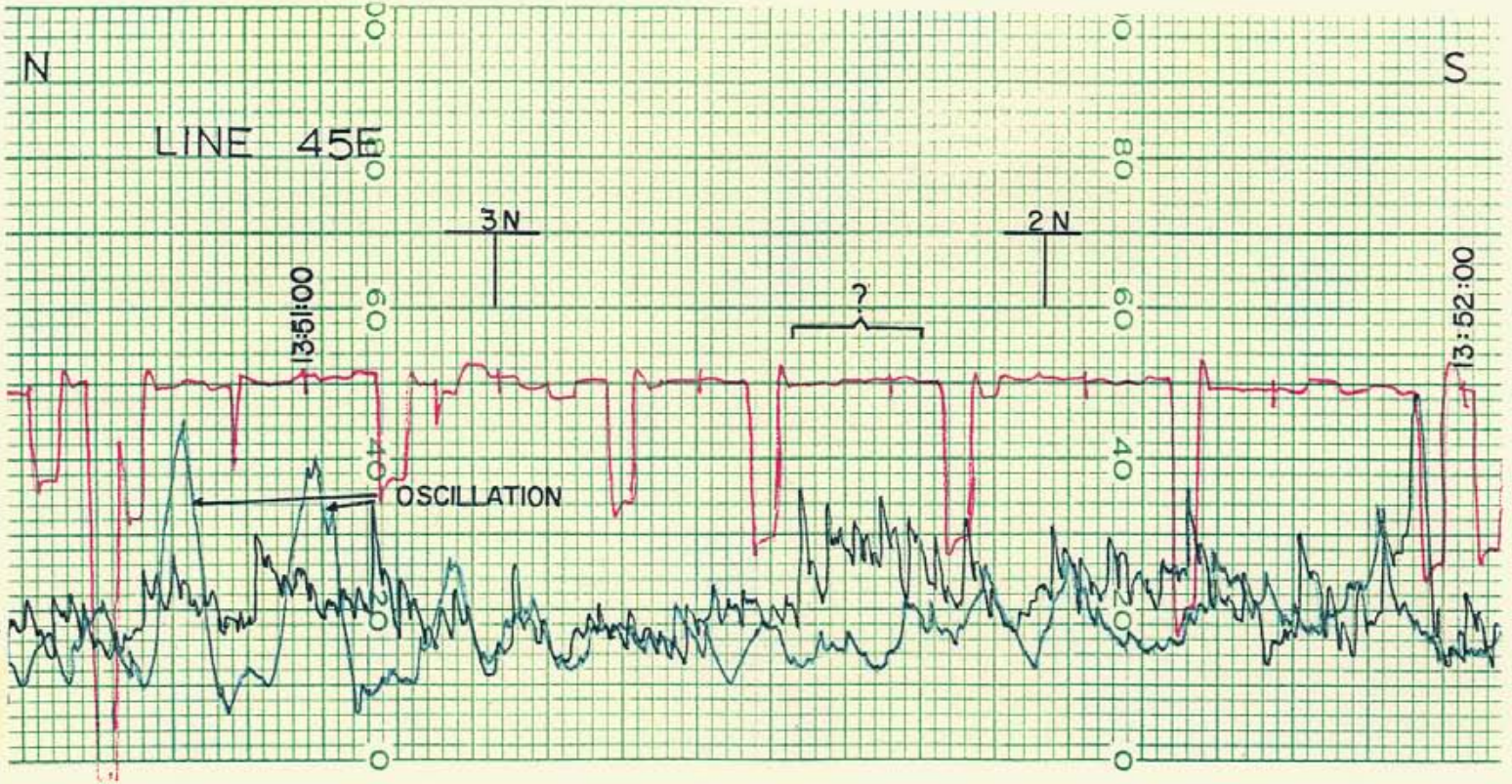
MAGNETOMETER : RED
VLF-EM (SEATTLE) : BLUE
VLF-EM (ANNAPOLIS) : BLACK

FIG. 21

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## MANDON PROJECT

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VLF - EM : VERTICAL SCALE 1 cm = 10 %

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VLF - EM (SEATTLE) : BLUE
VLF - EM (ANNAPOLIS) : BLACK

FIG. 22


COBRE EXPLORATION LIMITED

MANDON PROJECT

WESTERN GEOPHYSICAL AERO DATA LTD.

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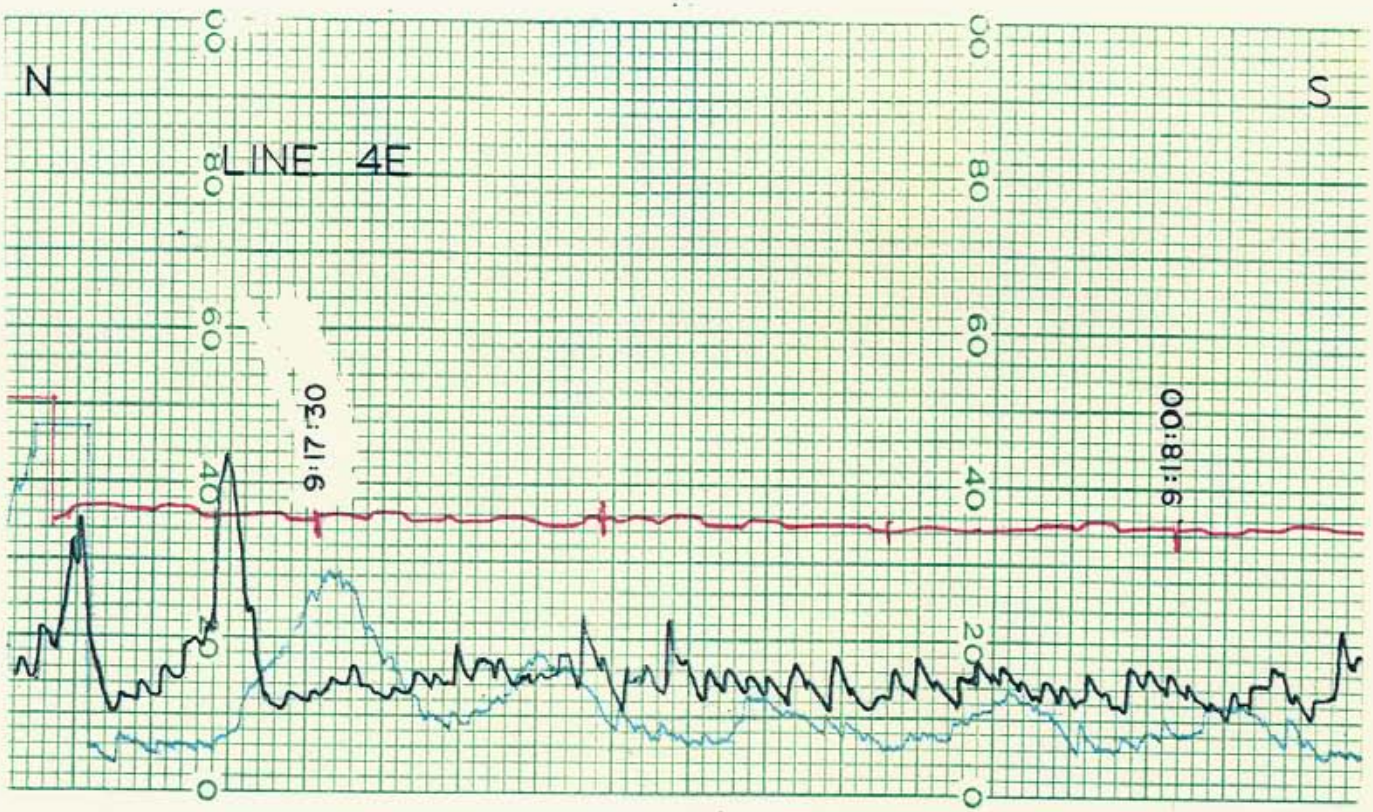
VLF - EM : VERTICAL SCALE 1 cm = 10 %

MAGNETOMETER : RED

VLF - EM (SEATTLE) : BLUE

VLF - EM (ANNAPOLIS) : BLACK

FIG. 23




# COBRE EXPLORATION LIMITED

## MANDON PROJECT

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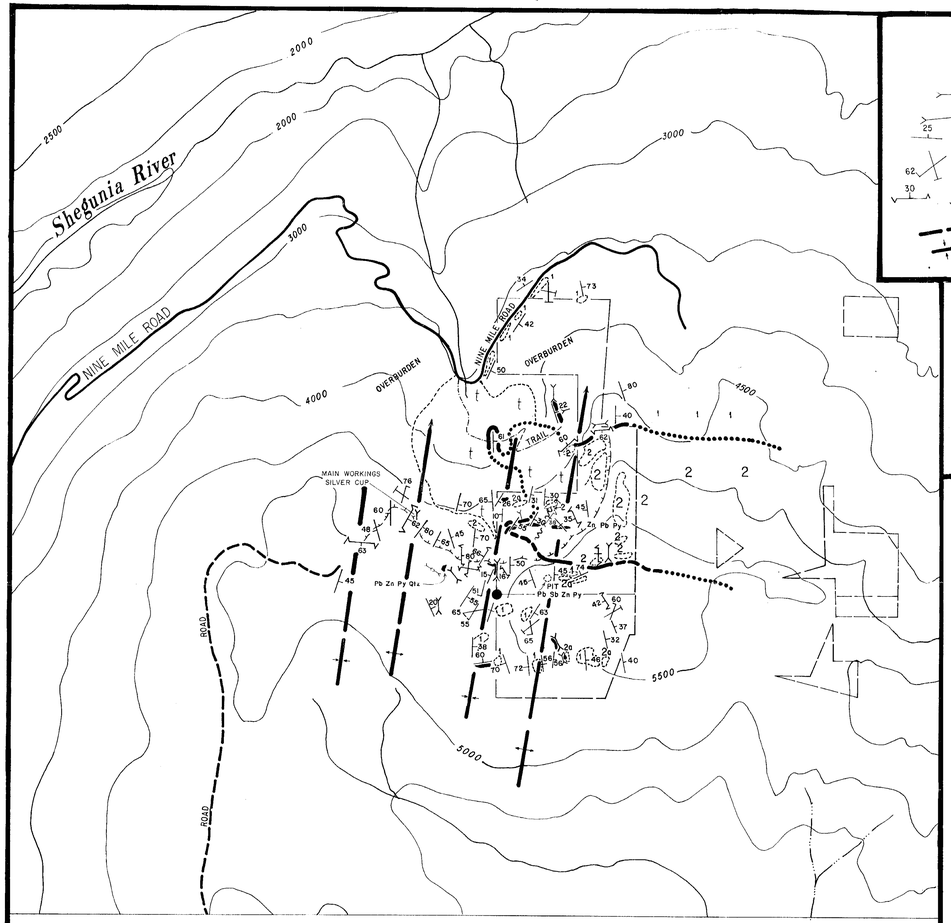
MAGNETOMETER : RED
VLF-EM (SEATTLE) : BLUE
VLF-EM (ANNAPOLIS) : BLACK

FIG. 24




LOCAL GEOLOGY
Nine Mile Mountain

N

0 250 500 1000
METRES

CONTOUR INTERVAL : 500 FEET
ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL

## SYMBOLS

- LEGAL CORNER POST
- ADIT
- TRENCH
- STRIKE AND DIP OF BEDDING, VERTICAL
- JOINTING — INCLINED, VERTICAL
- SHEAR
- ANTICLINE
- SYNCLINE
- UPPER RIM OF BASIN
- OUTCROP
- MINERALIZED ZONES
- CREEKS & STREAMS
- SAMPLE NUMBER & LOCATION
- FAULT
- GEOLOGICAL BOUNDARY DEFINED, APPROXIMATE, ASSUMED

## STRATIGRAPHY

**Early Tertiary**

2 GRANODIORITE

2a DIORITE & ALASKITE DYKES

**Upper Jurassic and Cretaceous**

1 GREYWACKE, QUARTZITES, SILTSTONES, MINOR CONGLOMERATE AND LOCALLY HORNFELS.

# SHORT STAUN
## MINERALS CORPORATION

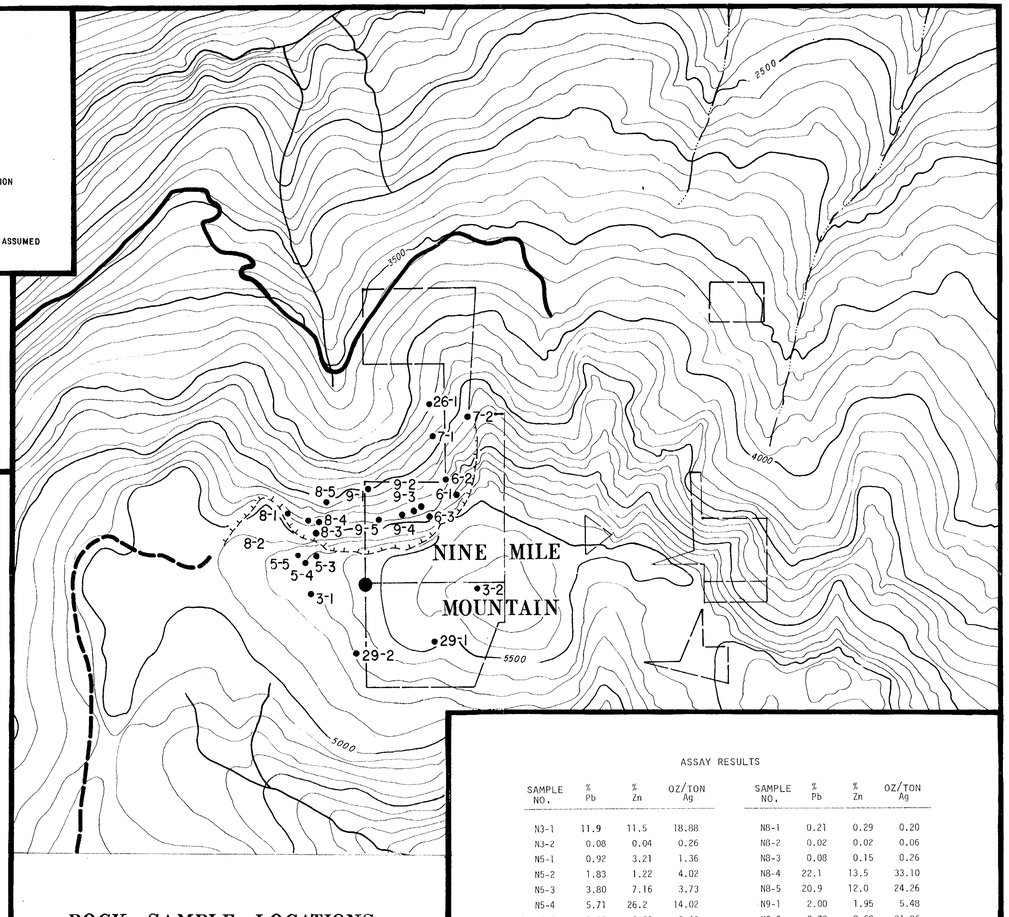
# CUP CLAIMS
## Nine Mile Mountain, B.C.
## 93 M 5E & 5W

SAMPLE LOCATIONS
ASSAY RESULTS
LOCAL GEOLOGY

to accompany report by

J. LOGAN and
L.B. GOLDSMITH, P.Eng.
September 1980
ARCTEX ENGINEERING SERVICES






ROCK SAMPLE LOCATIONS

0 250 500 1000

CONTOUR INTERVAL: 100 FEET

N

ASSAY RESULTS

| SAMPLE NO. | % Pb | % Zn | OZ/TON Ag | SAMPLE NO. | % Pb | % Zn | OZ/TON Ag |
|---|---|---|---|---|---|---|---|
| N3-1 | 11.9 | 11.5 | 18.88 | N8-1 | 0.21 | 0.29 | 0.20 |
| N3-2 | 0.08 | 0.04 | 0.26 | N8-2 | 0.02 | 0.02 | 0.06 |
| N5-1 | 0.92 | 3.21 | 1.36 | N8-3 | 0.08 | 0.15 | 0.26 |
| N5-2 | 1.83 | 1.22 | 4.02 | N8-4 | 22.1 | 13.5 | 33.10 |
| N5-3 | 3.80 | 7.16 | 3.73 | N8-5 | 20.9 | 12.0 | 24.26 |
| N5-4 | 5.71 | 26.2 | 14.02 | N9-1 | 2.00 | 1.95 | 5.48 |
| N5-5 | 2.20 | 3.58 | 2.40 | N9-2 | 9.79 | 8.68 | 21.96 |
| N5-6 | 33.8 | 2.22 | 6.68 | N9-3 | 7.08 | 15.3 | 17.58 |
| N6-1 | 0.16 | 0.31 | 0.36 | N9-4 | 1.65 | 10.3 | 5.50 |
| N6-2 | 0.06 | 0.19 | 0.12 | N9-5 | 12.0 | 7.56 | 15.06 |
| N6-3 | 1.60 | 1.56 | 2.26 | N29-1 | 0.16 | 0.14 | 0.40 |
| N7-1 | 1.12 | 12.2 | 13.72 | N29-2 | 0.02 | 0.01 | 0.36 |
| N7-2 | 0.68 | 3.10 | 1.20 | N26-1 | 10.3 | 11.5 | 2.90 |