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GEOPHYSICAL REPORT  
For  
HECATE GOLD CORPORATION  
On A  
PULSE ELECTROMAGNETOMETER SURVEY

John claims, Mt. Johnson area, Slocan  
Mining Division, B. C.  
Lat. 50°28'N Long. 117°07'W N.T.S. 82 K/6

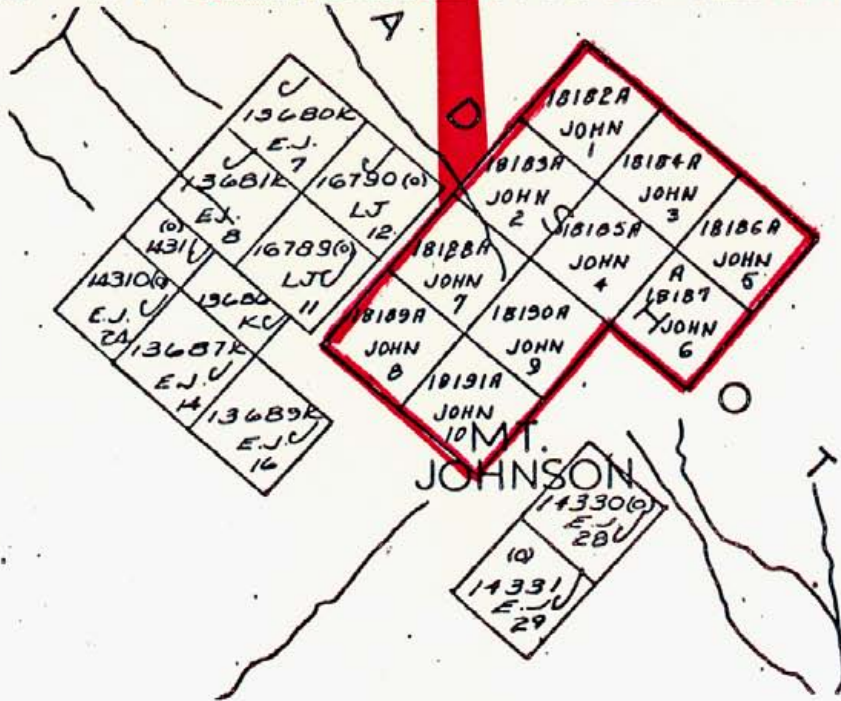
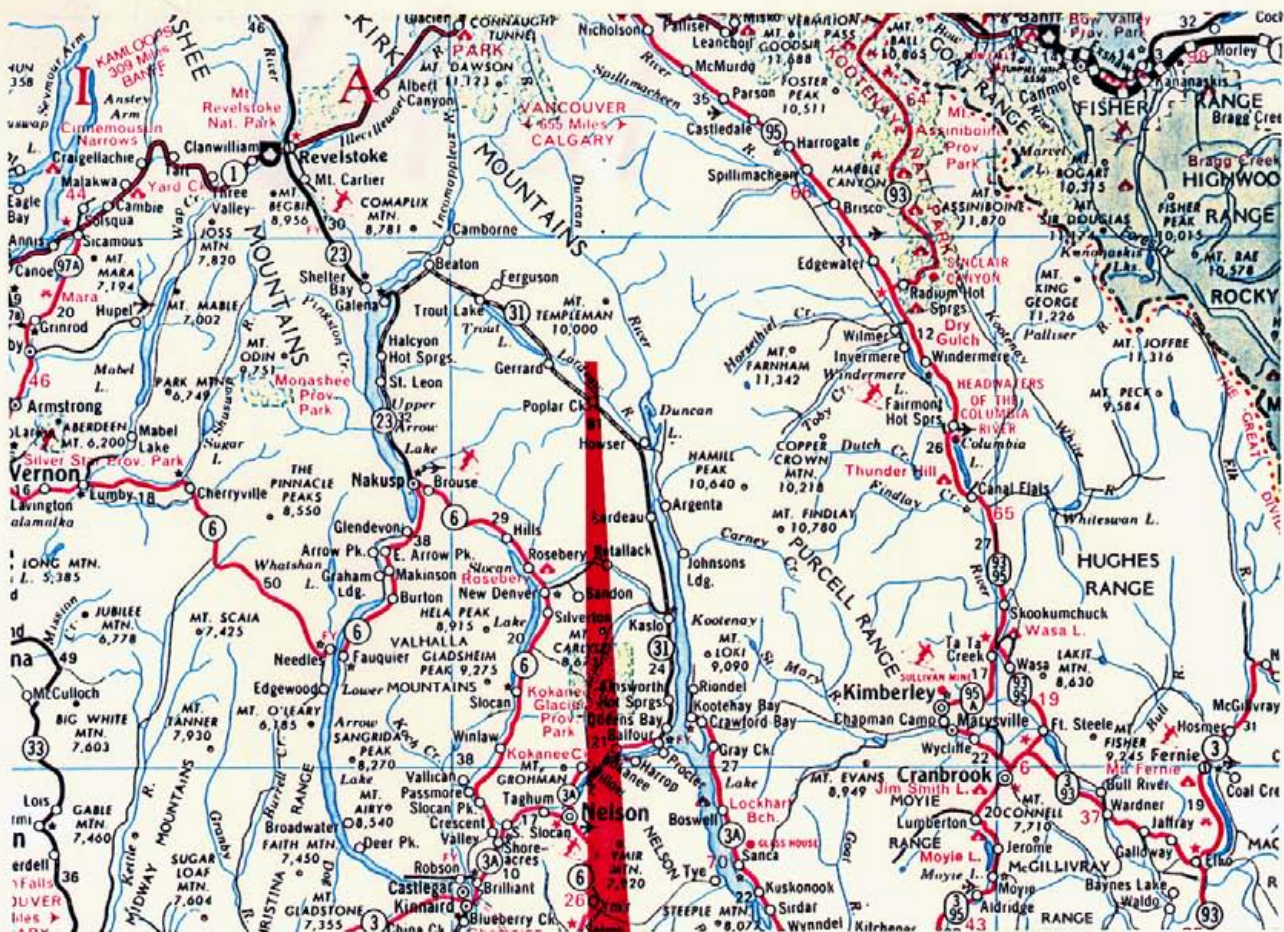
AUTHOR: Glen E. White, B.Sc., P. Eng.  
DATE OF WORK: August 14 - 21, 1977  
DATE OF REPORT: August 30, 1977

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT

NO. \_\_\_\_\_

*Glen E. White*

GEOPHYSICAL CONSULTING & SERVICES LTD.



**HECATE GOLD CORP.  
JOHN CLAIMS  
LOCATION AND CLAIM MAP**

*Geo & W. H. S.*  
*geophysical consulting*  
*3*  
*services ltd*

SCALE: 1" = 40 MILES

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Figure 1 - Location and Claims Map

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" 2C - " " - Zinc

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## INTRODUCTION

During the period August 14 - 21, 1977, a program of pulse electromagnetometer (PEM) surveying was conducted over the John mineral claims by Glen E. White Geophysical Consulting & Services Ltd. on behalf of Hecate Gold Corp. (formally Sproatt Silver Mines Ltd.)

The purpose of the survey was to examine an area of known argentiferous galena and sphalerite showings for a possible electromagnetic conductor.

## PROPERTY

The property consists of the John 1 - 10 mineral claims as illustrated on Figure 1. The survey covered portions of John 1, 3 and 5.

## LOCATION AND ACCESS

Mt. Johnson is located some 7 miles west of Duncan Lake and some 3 miles due north of the small road stop of Poplar Creek some 15 miles beyond the turnoff to Duncan Dam on Highway #31. Latitude  $50^{\circ}28'N$ , Longitude  $117^{\circ}07'W$ , N.T.S. 82 K/6, Slocan Mining Division, B.C.

Access is by helicopter from Nelson or Kaslo, B.C.

### GENERAL GEOLOGY

A good description of the physiography and general geology of the property is contained in a report by J. W. Macleod, P. Eng., for Sproatt Silver Mines, Dec. 15/75, wherein he states:

Mt. Johnson is underlain by the lower part of the Cambrian Lardeau Group. The green schist Index Formation is the youngest rock exposed. This formation overlies regionally a thick series of principally phyllites which due to facies change in the vicinity of Mt. Johnson are largely carbonate rocks. The presence of limestone and dolomite here accounts for the potential lead-zinc deposits.

### SURVEY SPECIFICATIONS

#### Survey Grid

The survey lines were turned off at right angles every 400 feet from a NW-SE directed baseline which traverses the John 1, 3 and 5 mineral claims. The geochemical soil sampling grid completed in 1975 over claim John 5 is shown in relationship to the present grid on Figures 2A, 2B and 2C.

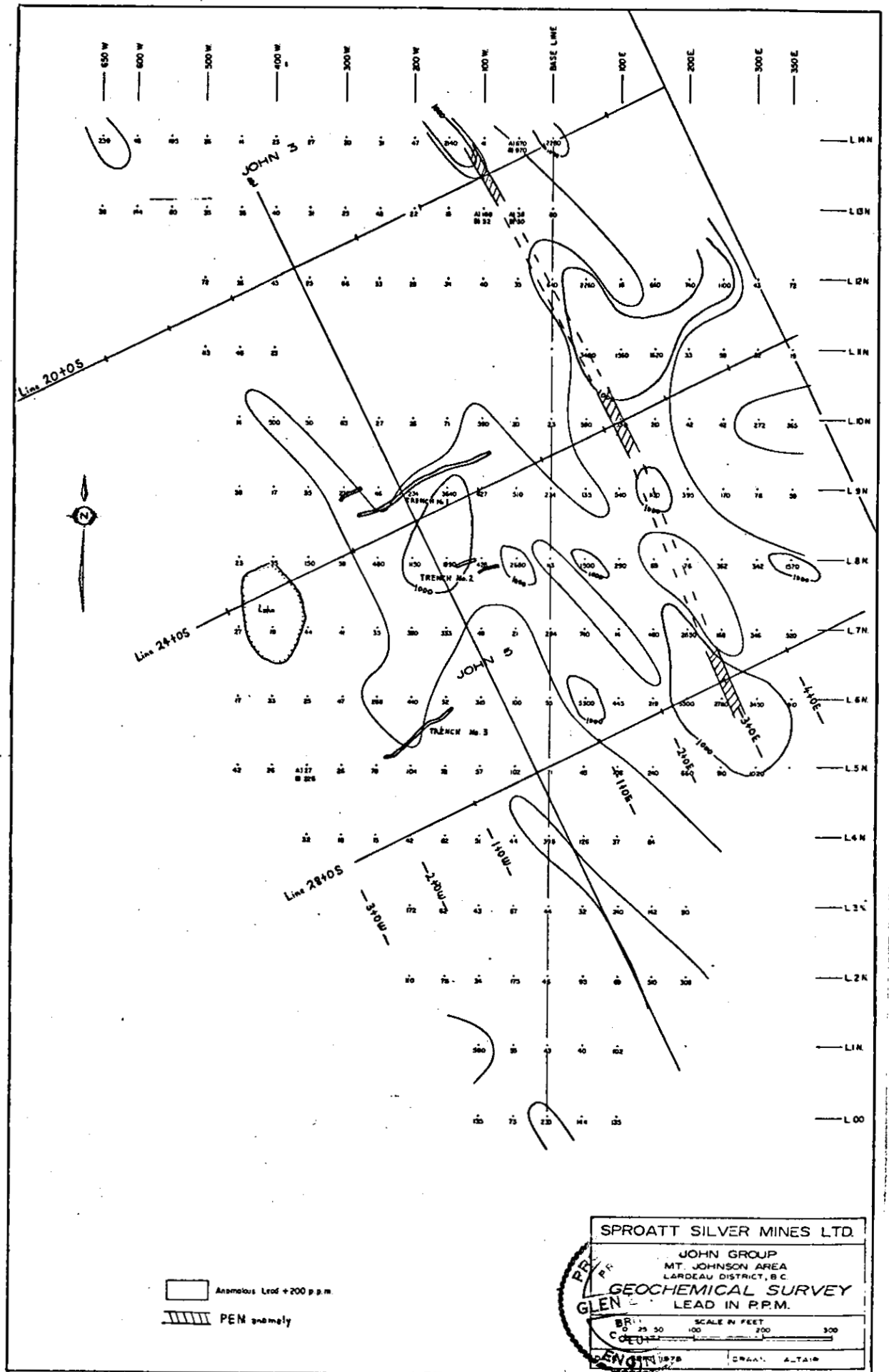
### Pulse Electromagnetometer Survey

The PEM system is used primarily in the horizontal loop configuration. The transmitter consists of a transmit loop 6 meters in diameter that is laid out horizontally on the ground. The loop is energized by a pulse of 15 to 20 amps at 24 volts. The current is turned off by a special ramp circuit. The on-off time is 10.8 ms. The receive coil is generally spaced 25 - 100 meters from the transmit loop. The signal on the receive coil is sampled, averaged and then stored during the reading interval. One sample is taken of the primary pulse and eight samples are taken of the secondary field during the off time. Time synchronization is by radio link or cable.

The eight channels of secondary field information are equivalent to a wide spectrum of frequency information from approximately 2 KHz to 16 Hz which allows for determination of overburden effects and penetration of conductive overburden. Since the secondary field is measured directly during the primary field off time, the pulse method is free of geometrical restrictions between the transmit and receive coil positions, such as topography interference and coil alignment.

A separation of 200 feet was used for the survey.

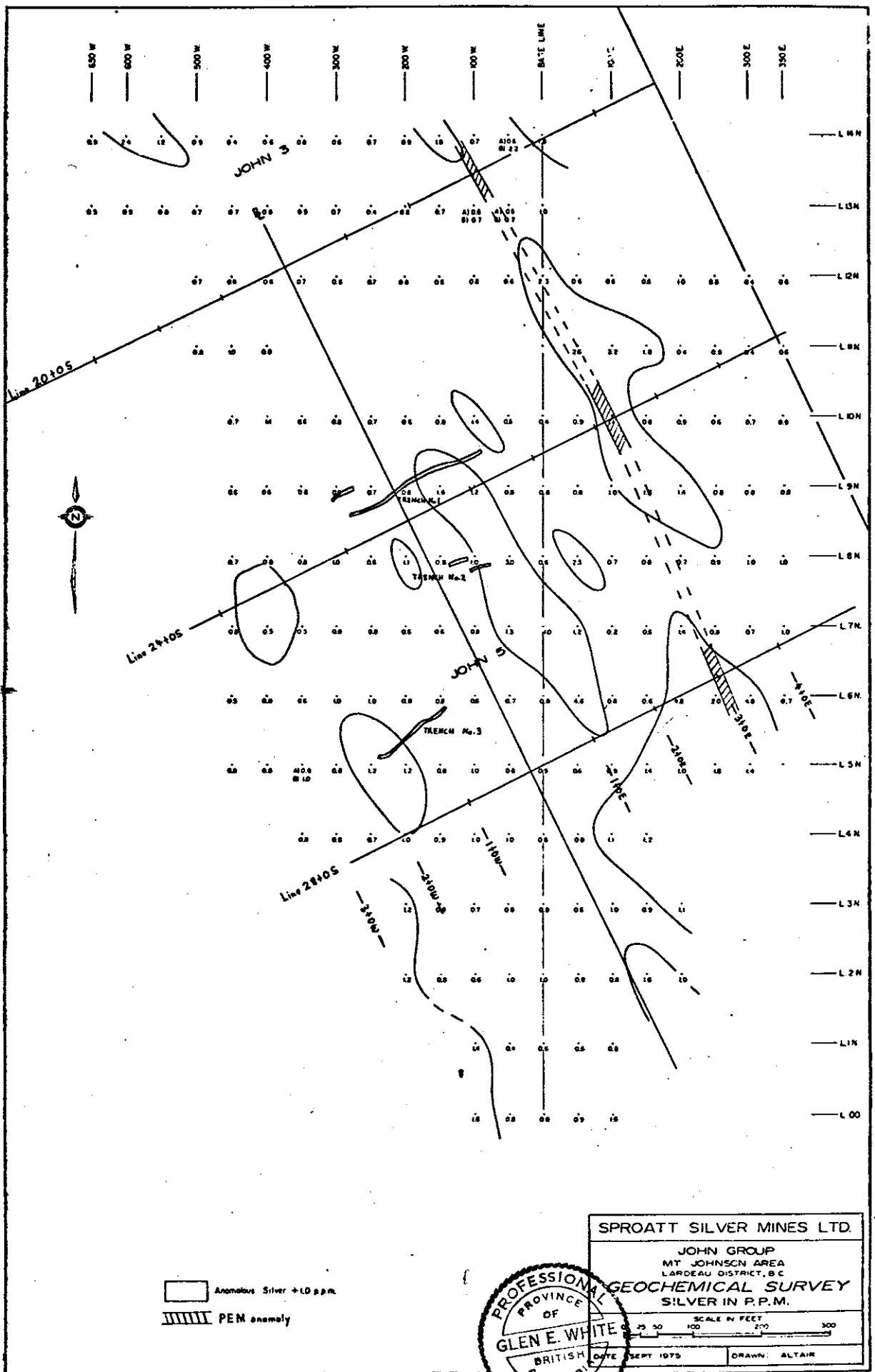




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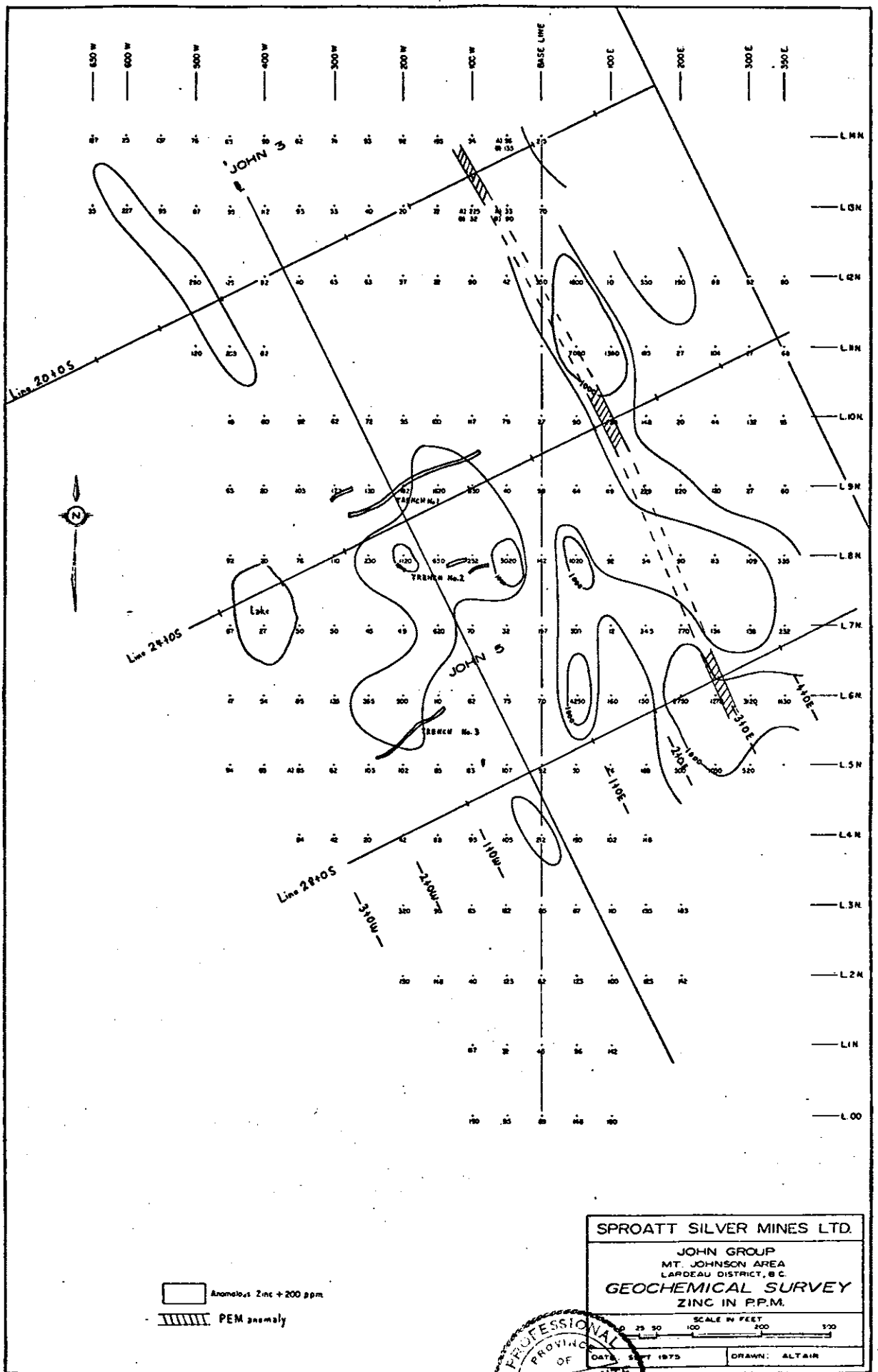
Fig 2A





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Fig 2B



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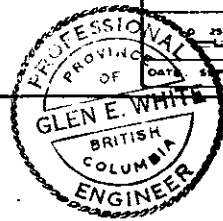


Fig 2C

## DISCUSSION OF RESULTS

The interpreted conductors are illustrated on Figures 2, 2A, 2B and 2C.

Line 4N shows a strong shallow "thin sheet" conductor which is associated with a surface gossan and would be in the area of the 1 foot of 20.22% Pb, 10.95% Zn and 1.14 oz. Ag as reported by J. W. Macleod, P. Eng.

Line 0 shows two weak responses, one at 2W, which may possibly be an extension, at depth ( 50' ), of the conductor on Line 4N, and the second at 2 / 50 E.

Line 4S shows a weak conductor at 4E, at possibly a depth of 50 - 100', which correlates with the conductor on Line 0 at 2 / 50 E.

Line 8S shows a negative response which appears to be associated with a narrow band of limestone and may indicate a flat lying conductor.

Line 12S shows a negative effect an on Line 8 and a weak positive response at 4E.

Line 16S has no defined conductor responses.

Lines 20S - 28S can be correlated with the geochemical data illustrated in Figures 2A - 2C. Line 20S detected a weak near surface conductor at 3E which correlates with strong lead geochemical values, and a defined negative response at 1 / 50W which may indicate

a flat lying conductor dipping some  $15^{\circ}\text{E}$  at a depth of 50 - 100 feet. Line 24S shows a slight surface single channel conductor at 0 with a stronger multichannel response at 3E which is associated with positive geochemical results of Ag, Pb and Zn. Line 28S shows a weak conductor at 3 / 50W with the main part of the conductor possibly being off the line to the SE.

#### CONCLUSION AND RECOMMENDATIONS

During the month of August 1977, a program of PEM surveying was conducted over a number of lead, zinc and silver bearing mineral showings on Mt. Johnson, Slocan Mining Division, B.C. The PEM survey detected a strong sheet-like conductor on Line 4N and a weak conductor zone on claim John 5 which correlates with anomalous geochemical data. Several small flat lying conductors may have been detected on lines 8S, 12S and 20S.

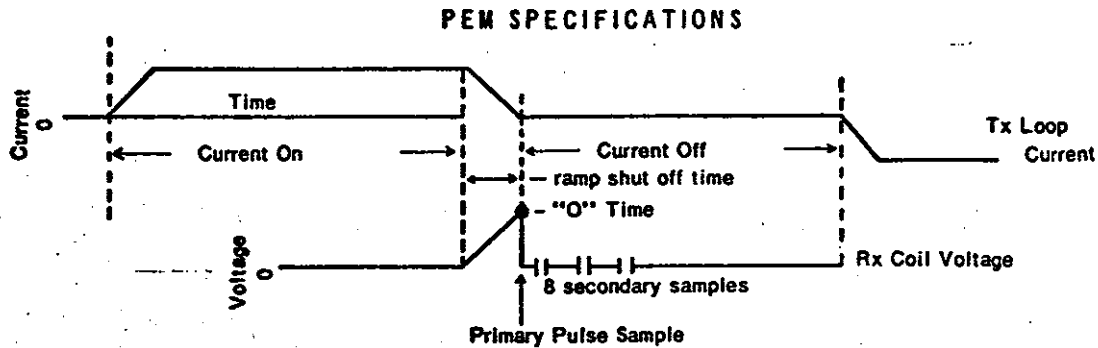
Sphalerite is non-conductive, thus the detection of a mineral zone is dependant upon the proportion of galena to sphalerite and interconnected galena mineralization. Thus, though the conductor responses are weak, they should be evaluated by a limited program of diamond drilling to determine their mineral content.

Respectfully Submitted,

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

*Glen E. White*

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Current Off time: 9.4 ms  
 Current on time: 10.8 ms  
 Current shut off (ramp) time: 1.4 ms  
 Sample times (zero to centre of sample): .15ms, .45ms, .85ms, 1.45ms, 2.45ms, 3.75ms, 5.85ms, 8.85ms.

Sample width: 100  $\mu$ s  
 Zero time set at drop off point of primary pulse

**TRANSMITTER** — Transmitter power and loop size may be increased to obtain increased penetration. Weight, portability and power capabilities of the control instrument are the limiting factors. The standard transmitter is designed to be carried by two men.

Loop diameter — minimum 4 meters (13 feet)  
 Loop current — 15 to 20 amps  
 Loop applied voltage — 24 volts  
 Loop output — minimum 4500 amps x meter<sup>2</sup>  
 Loop weight — 11.8 kilos (26 lb)  
 Control unit weight — 10 kilos (22 lb)  
 Control unit dimensions — 20.5cm x 25.5cm x 36.5cm (8" x 10" x 14.5")  
 Battery supply weight — 18.1 kilos (40 lb)  
 Battery supply — 2 of 12 volt, 14 to 20 ampere hour  
 Timing control by radio synchronization

#### RECEIVER

— Receive coil dimensions: 55cm x 15cm (22" x 6")  
 — Receive coil weight: 4.5 kilos (10 lb)  
 — Preamplifier in coil  
 — Preamplifier batteries: 2 of 9 volt  
 — Receive coil tripod mounted  
 — Receiver measuring instrument dimensions: 28cm x 18cm x 21.5cm (11" x 7" x 9")  
 — Receiver measuring instrument weight: 6.3 kilos (14 lb)  
 — Timing control by radio synchronization  
 — Primary sample width: 100  $\mu$ s  
 — Primary sample can be swept through primary pulse by means of a time calibrated pot  
 — Zero time set at primary pulse drop-off  
 — Secondary samples (eight of them) width: 100  $\mu$ s  
 — Secondary samples time (zero to middle of sample): (1) .15ms (2) .45ms (3) .85ms (4) 1.45ms (5) 2.45ms (6) 3.75ms (7) 5.85ms (8) 8.85ms  
 — Automatic sampling for 5 seconds then all samples automatically stored  
 — Sample read out by means of meter  
 — Continuous sampling possible by switching function switch to "Continuous"  
 — Noise can be monitored by switching function switch to "Noise"  
 — Battery supply: 24 volt rechargeable, 2 of 12 volt Gel GC 12-15

STATEMENT OF QUALIFICATIONS

**Name:** WHITE, Glen E.

**Profession:** Geophysicist

**Education:** B.Sc. Geophysics - Geology  
University of British Columbia

**Professional Associations:** Associate member of Society of  
Exploration Geophysicists.

Vice-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 Explorations 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.

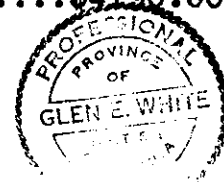
Two years Chief Geophysicist Tri-Con  
Exploration Surveys Ltd.

Six years Consulting Geophysicist.

Active Experience in all Geologic provinces  
of Canada.

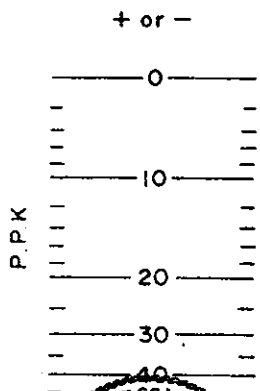
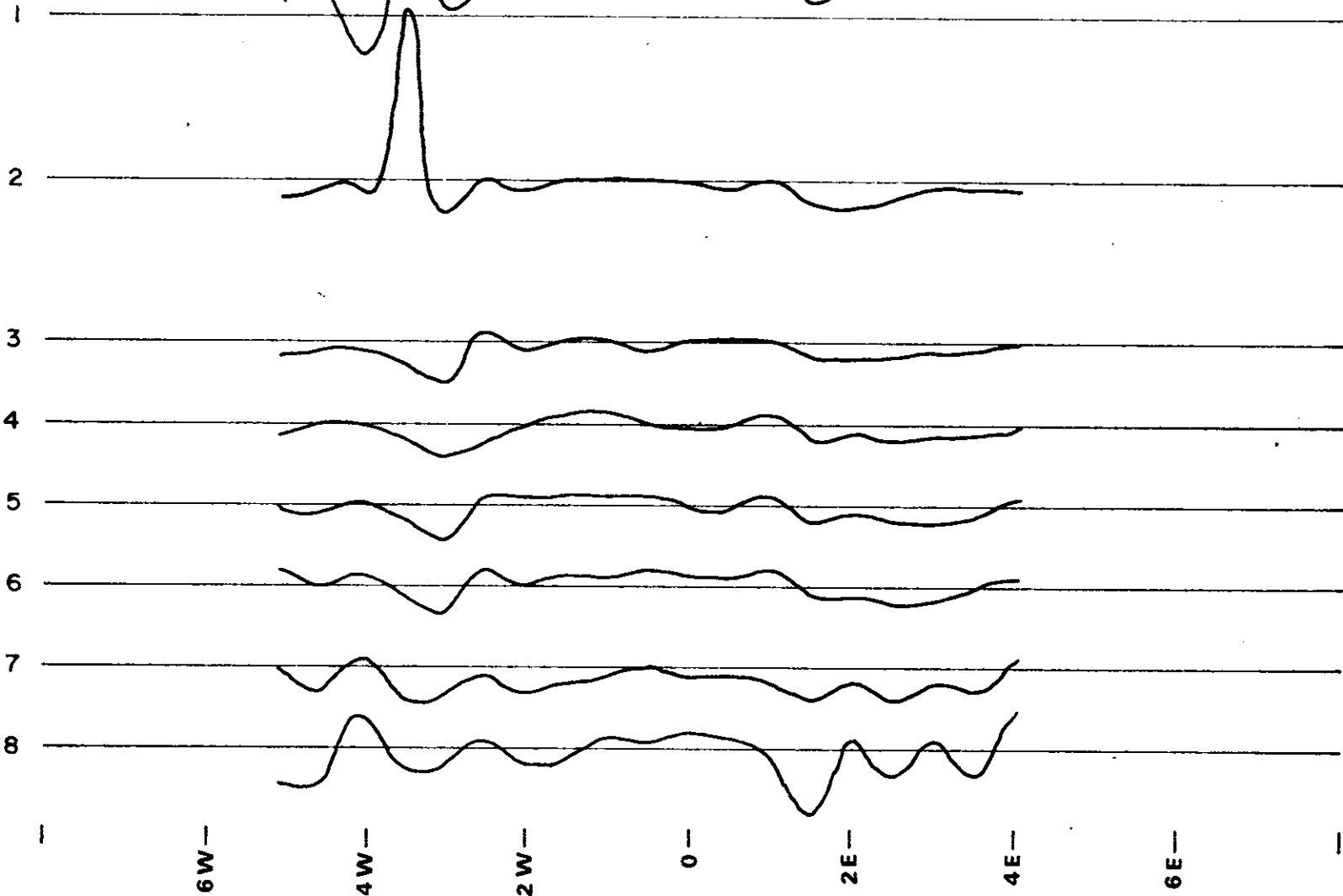
COST BREAKDOWN

<u>Personnel</u>	<u>Date</u>	<u>Wages</u>	<u>Total</u>
C. Candy, B.Sc. Geophysicist....	Aug. 14-21/77...	\$112/day....	\$896.00
J. Owens.....	"..."	\$65/day....	520.00
G. Steblin.....	"..."	\$65/day....	520.00
Meals and Accomodations.....			525.00
Instrument.....			595.00
Vehicle including gas.....			284.00
Interpretation maps and reports.....			850.00
Total.....			\$4190.00



LINE 4 N  
INSTRUMENT : CRONE P.E.M.

CHANNELS



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&  
surveying ltd.

HECATE GOLD CORP.  
PULSE ELECTROMAGNETOMETER  
SEPARATION 200 FT.

SCALE: 1" = 200'

N.T.S. 82 K6

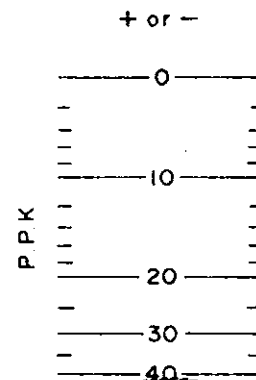
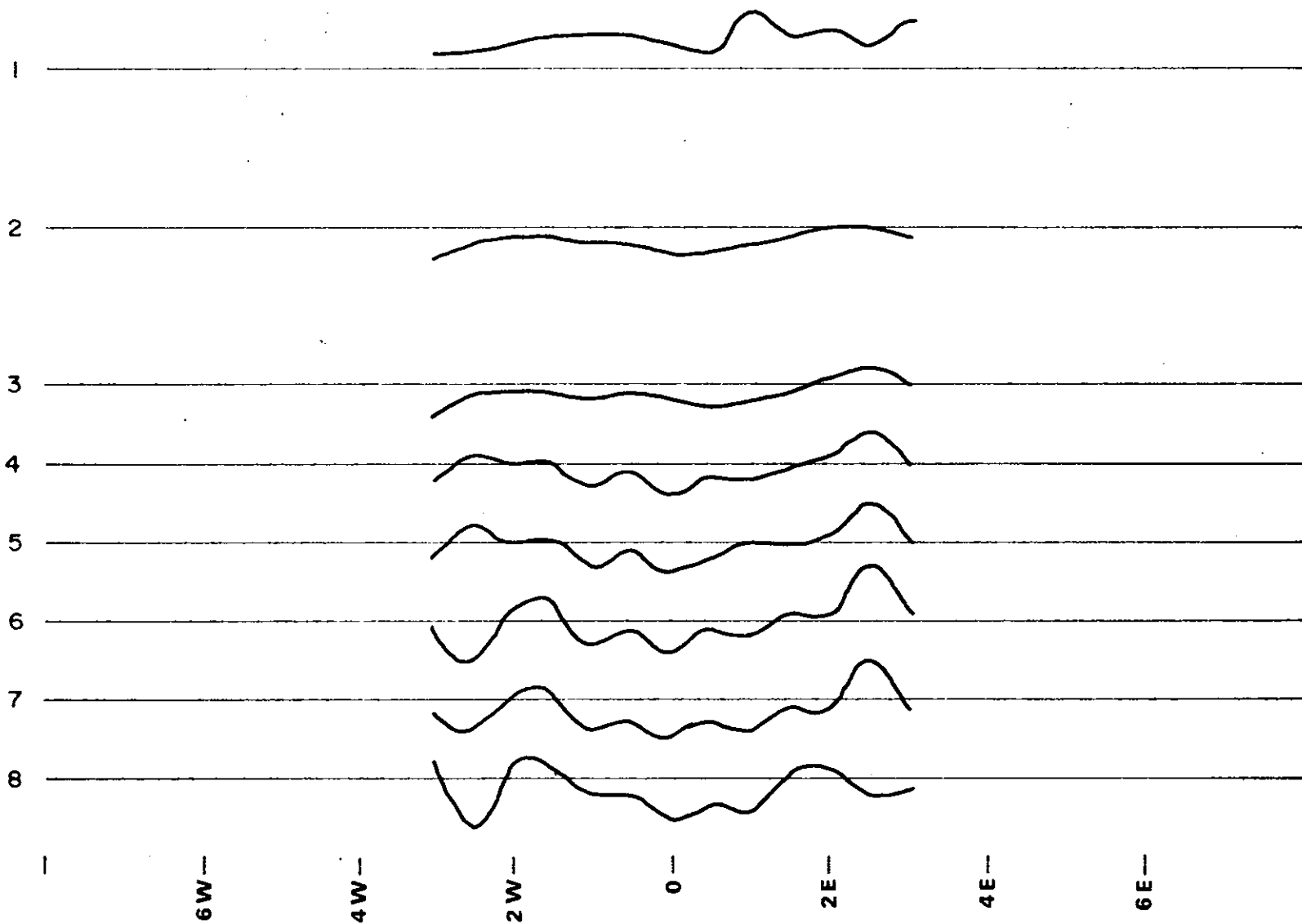
FIG. 3

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LINE ON  
INSTRUMENT: CRONE P.E.M.

CHANNELS



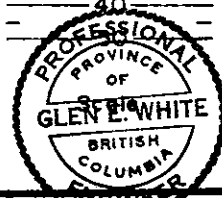
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FIG. 4

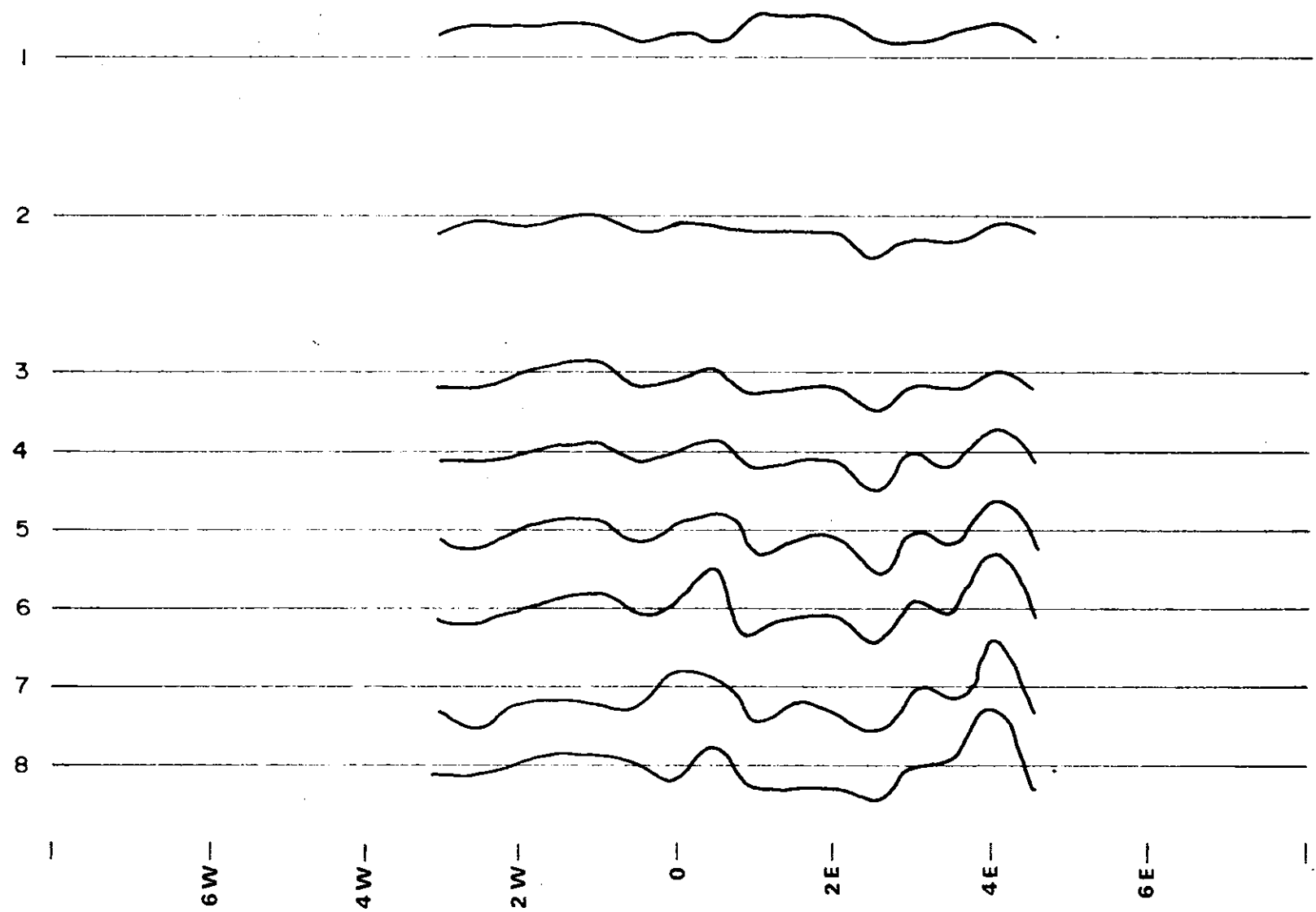


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LINE 4 S  
INSTRUMENT : CRONE P.E.M.

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SCALE 1" = 200'

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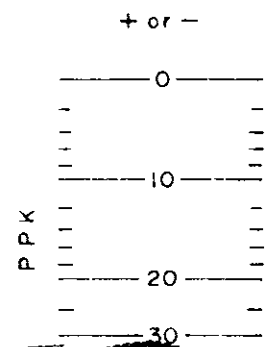
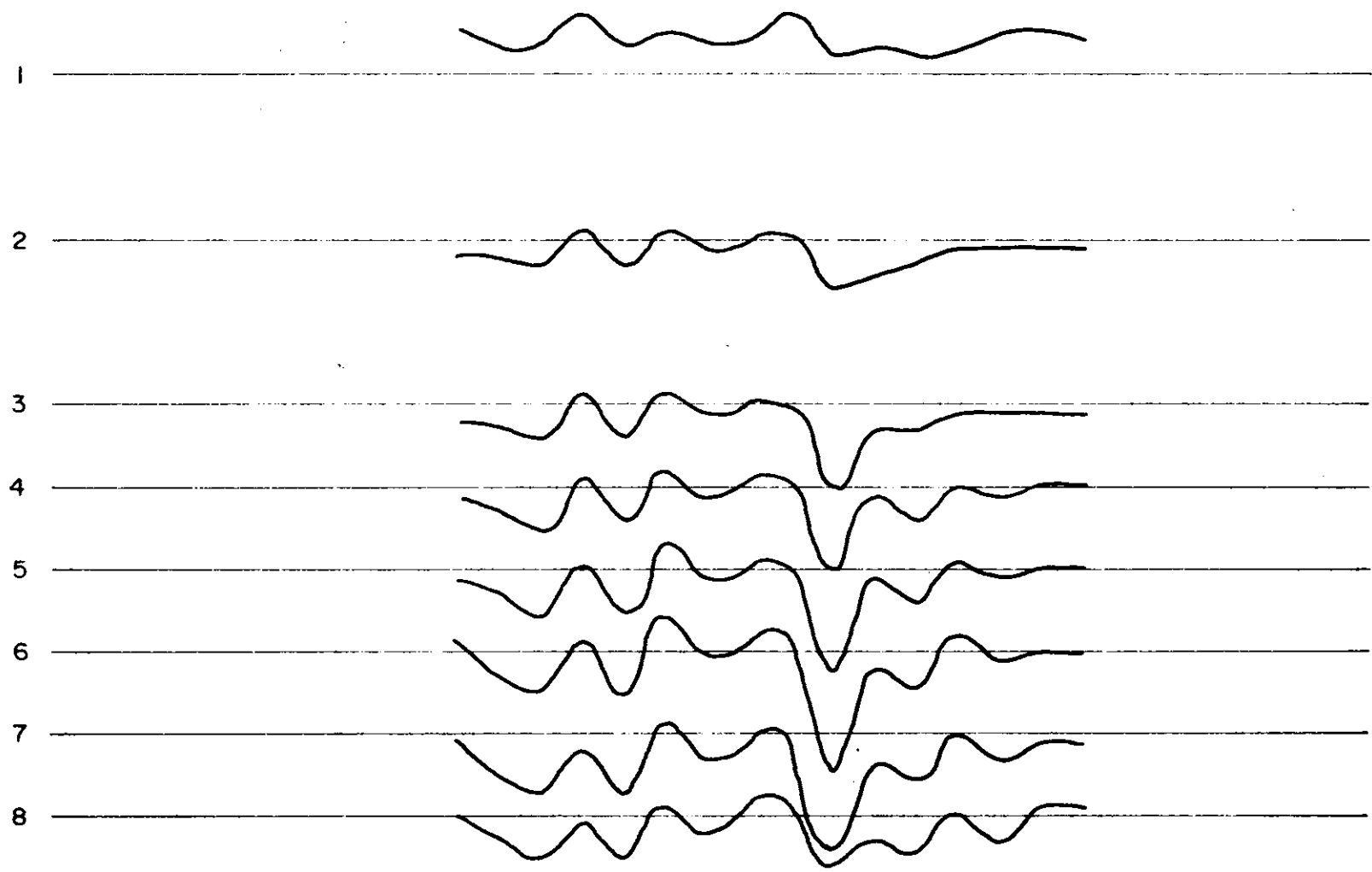
FIG 5



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LINE 8 S  
INSTRUMENT CRONE P.E.M.

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SCALE 1" = 200'

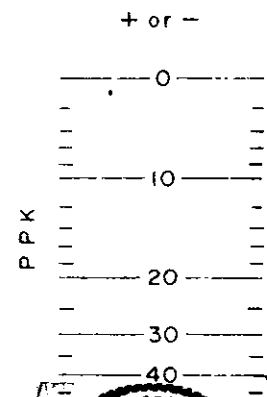
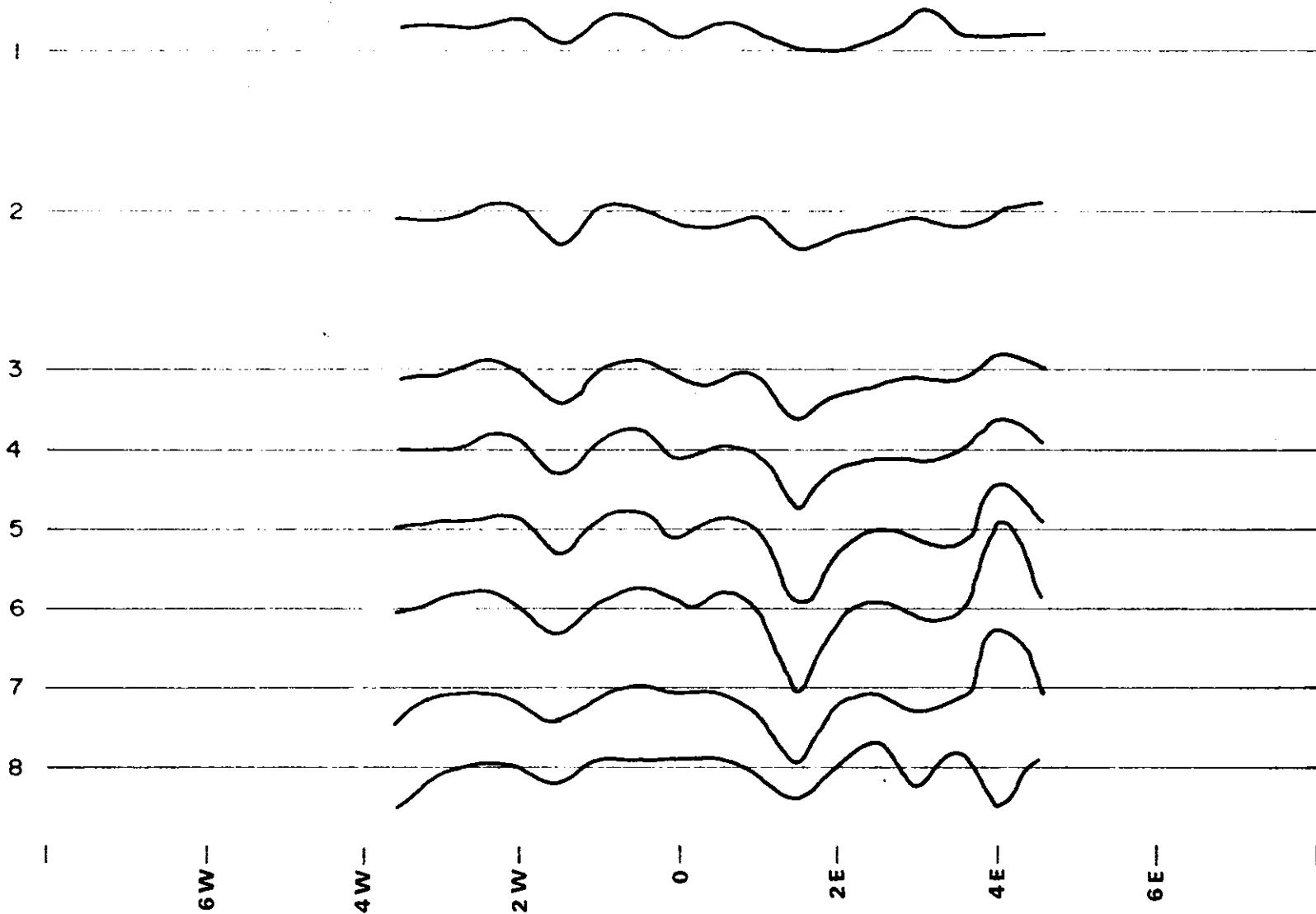
N.T.S. 82 K6

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PULSE ELECTROMAGNETOMETER  
SEPARATION 200 FT.

FIG 6

LINE 12S  
INSTRUMENT CRONE PEM

CHANNELS



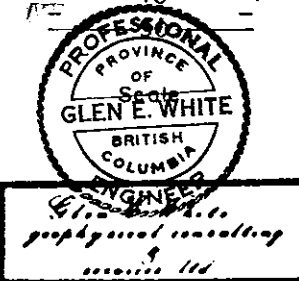
1979

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PULSE ELECTROMAGNETOMETER  
SEPARATION 200 FT.

SCALE 1" = 200'

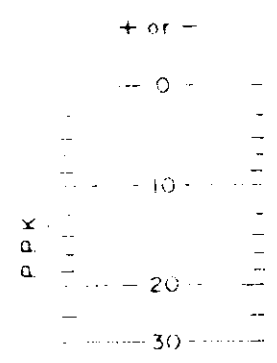
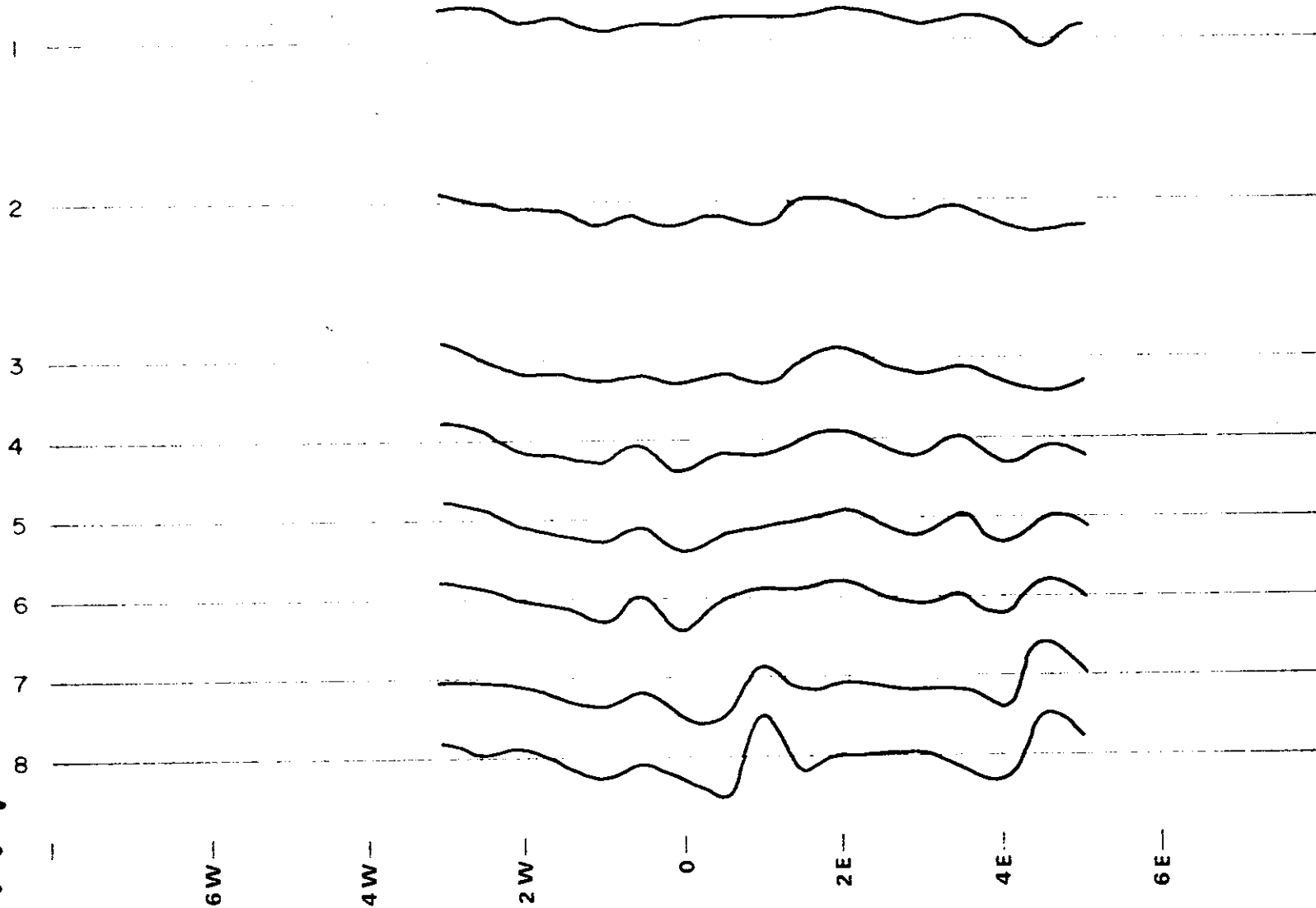
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FIG 7



LINE 16 S  
INSTRUMENT CRONE PE M

CHANNELS



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SEPARATION 200 FT.

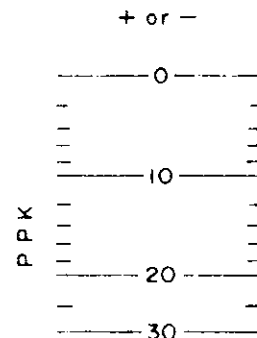
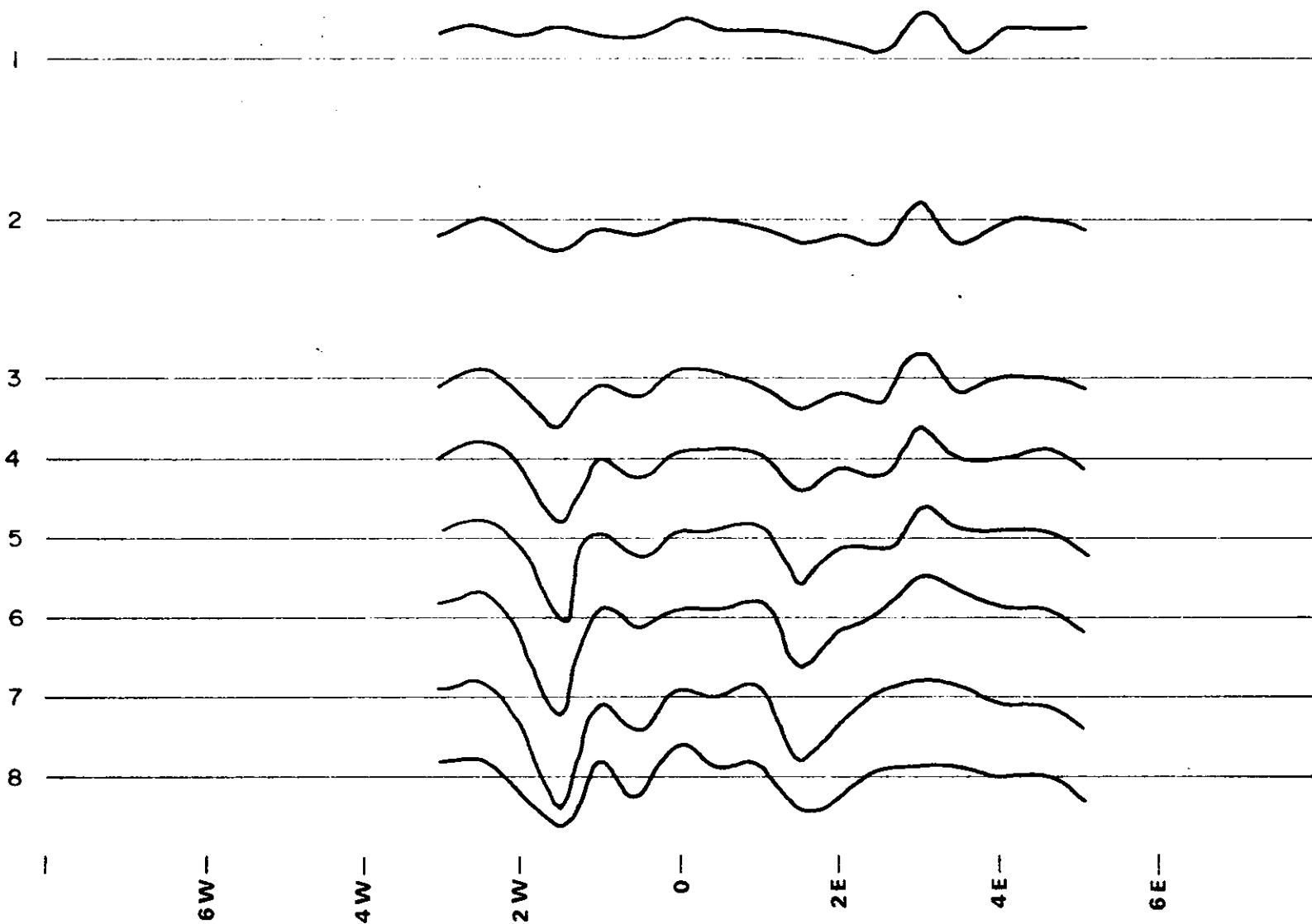
FIG 8

SCALE 1" = 200'  
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LINE 20 S  
INSTRUMENT : CRONE P.E.M.

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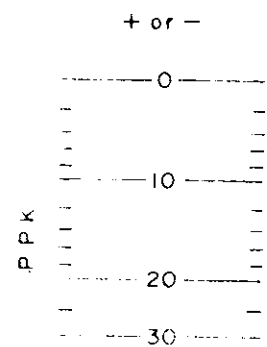
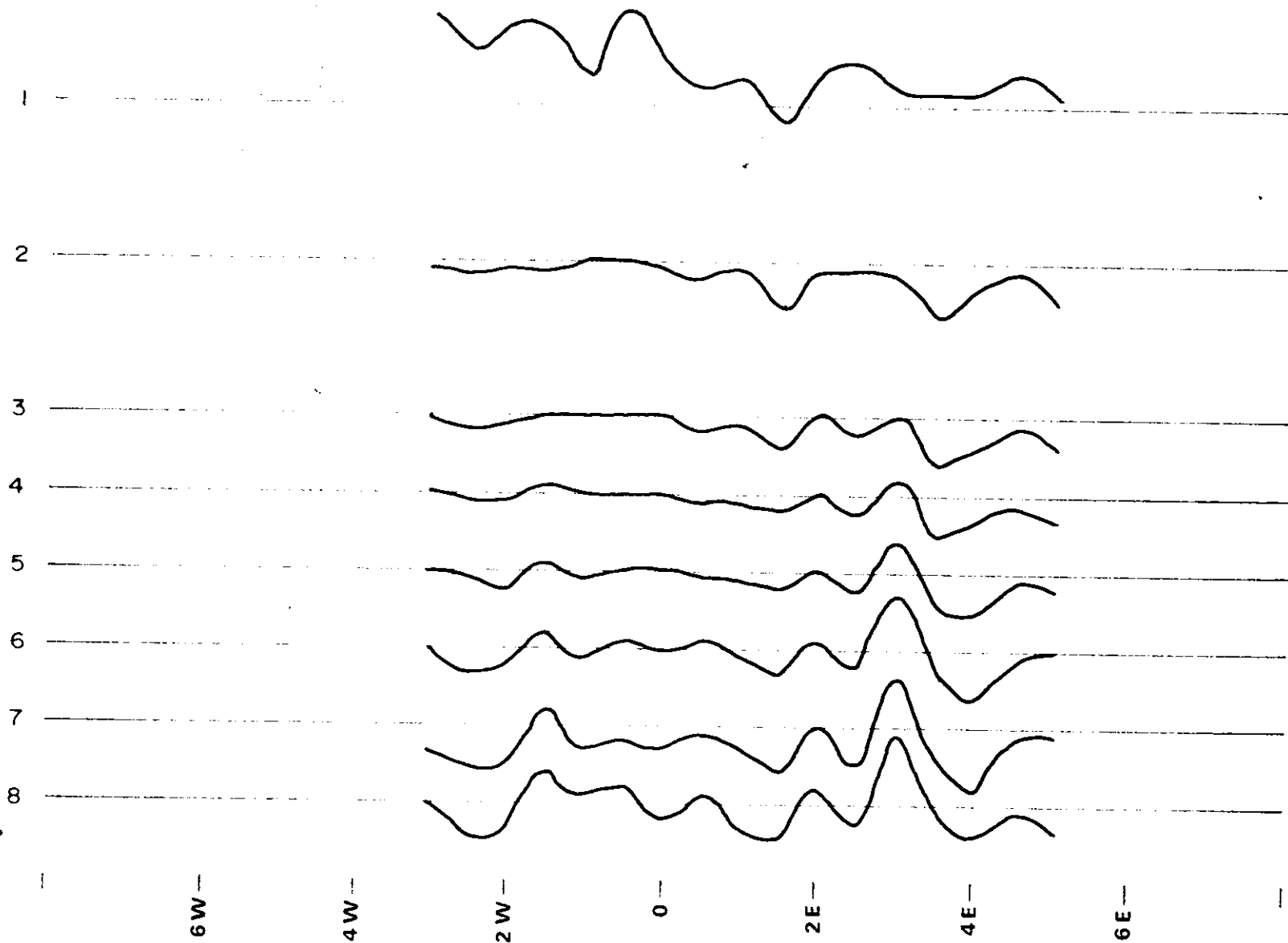
SCALE 1" = 200'

NTS 82 K6

FIG 9

LINE 24S  
INSTRUMENT CRONE P.E.M.

CHANNELS



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SCALE 1" = 200'

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SEPARATION 200 FT.

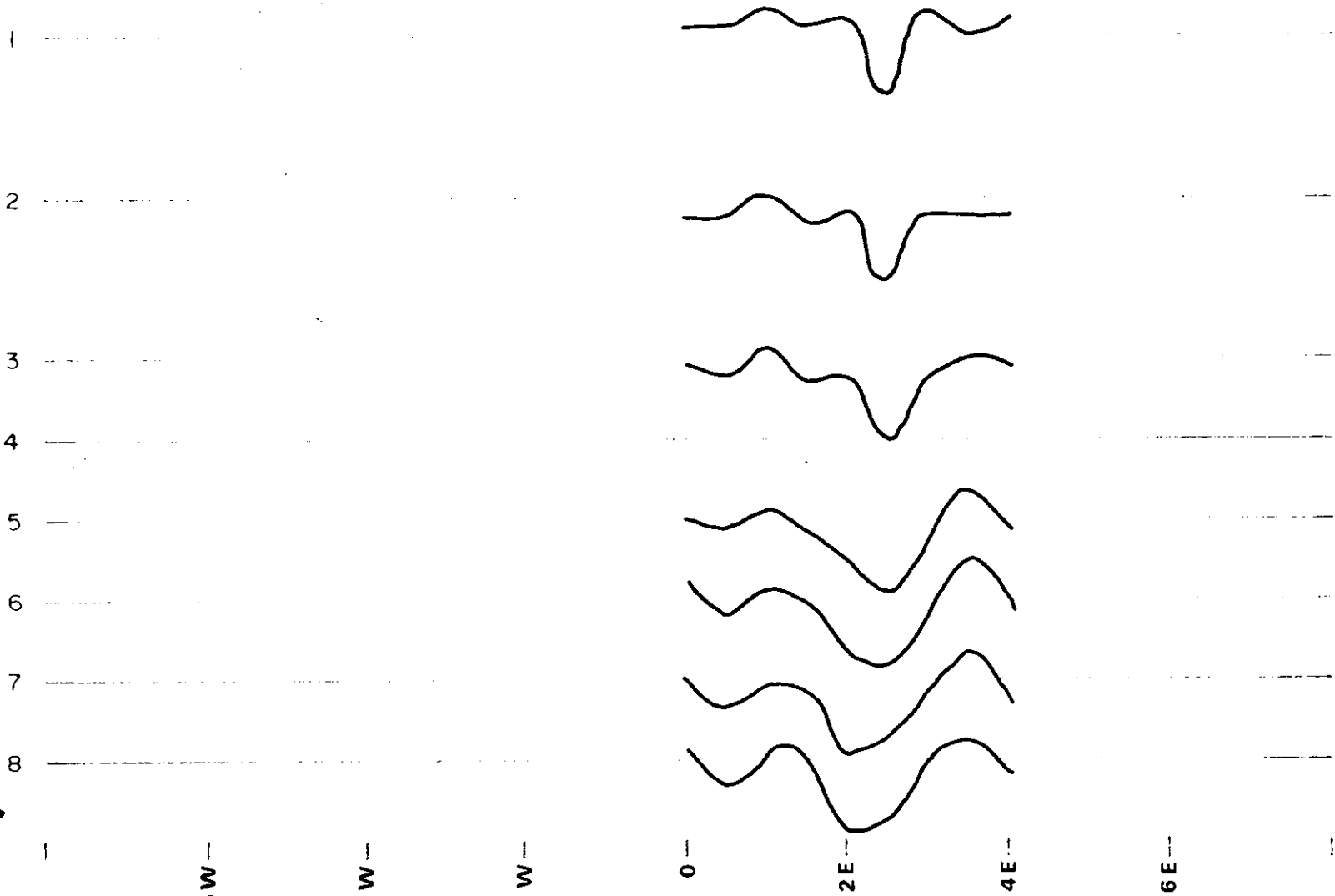


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&  
mining etc.

FIG 10

LINE 28S  
INSTRUMENT CRONE PEM

CHANNELS



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SCALE 1" = 200'

6W 4W 2W 0 2E 4E 6E

NTS 82 K6

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