



REPORT ON THE
AIRBORNE GEOPHYSICAL SURVEY
ON THE
CASSIAR CREEK PROPERTY
AND ADJACENT AREA
YUKON TERRITORY
64°23'N 140°10'W

090843

J. T. WALKER
NORANDA EXPLORATION COMPANY, LIMITED

FEBRUARY 18, 1981

YA32574 - YA32577 ROAD 1-4
YA32570 - YA32573 RAIL 1-4
YA32666 - YA32681 RAIL 5-20
YA32777 - YA32780 RAIL 21-24
YA32792 - YA32799 RAIL 25-32
YA32800 - YA32827 RAIL 35-62
YA32835 - YA32938 RAIL 63-166

YA47217 - YA47264 RAIL 165-212
YA49947 - YA49948 RAIL 213-214
YA52818 - YA52845 TRACK 1-28

situated at Cassiar Creek / Coal Creek.

Claim Sheet No.

116 C 8



This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of \$ 750.00

R. Debicki A. Reg
Resident Geologist or
Resident Mining Engineer Geol.

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

Commissioner of Yukon Territory

00800

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	1
SURVEY PERSONNEL	1
SURVEY PROCEDURE AND NAVIGATION	2
INSTRUMENTATION AND DATA RECORDING	2
(a) Proton Magnetometer	2
(b) Electromagnetic System (VLF-EM)	2
(c) Recording System	2
(d) Playback System	3
(e) Radar Altimeter	3
DATA REDUCTION AND PRESENTATION	3
(a) Aeromagnetic Data	3
(b) Electromagnetic Data (VLF-EM)	3
DISCUSSION OF RESULTS	4
CONCLUSIONS AND RECOMMENDATIONS	4

LIST OF MAPS

COMPOSITE MAP SHOWING:

Drawing No.1

- (1) Magnetic Contours With Topographic Underlay
- (2) VLF-EM Anomalies
- (3) Location Map

AIRBORNE GEOPHYSICAL SURVEY

on the

CASSIAR CREEK PROPERTY

and adjacent area

NORANDA EXPLORATION COMPANY, LIMITED

INTRODUCTION

On October 27, 1980, Noranda Exploration Company, Limited carried out an airborne geophysical survey in the Cassiar Creek, Yukon River area of the Yukon, covering an area of approximately 120 square kilometers. The survey area lies 25 miles northwest of Dawson. The area flown is outlined on the location map (116 C 8) at a scale of 1:250,000.

The purpose of the survey was to provide data for compiling a low level aeromagnetic contour map and to locate zones of conductivity at the VLF frequencies (18kHz - 21kHz).

Three measurements were recorded during the survey:

1. Total magnetic field intensity
2. Relative field strength of the horizontal component of the VLF-EM electromagnetic field from two transmitters
 - a) Seattle, Washington (Jim Creek) 18.6 kHz
 - b) Annapolis, Maryland 21.4 kHz

A Bell 206B helicopter, chartered from Trans North Turbo Air, Dawson, Yukon Territory, was used to fly the survey. Thirty-two lines were flown in an east-west direction and fifteen lines were flown in a north-south direction. The line spacing was nominally 400 meters with a helicopter terrain clearance of 60 meters. An aircraft speed of approximately 60 m.p.h. (100km/hour) was maintained on the survey flight lines. A total of 275 line kilometers were flown.

SURVEY PERSONNEL

Pilot: N. Asseltine
Navigator: R. McIntyre
Operator: T. Walker
Data Reduction,
Drafting: T. Walker

All personnel are employees of Noranda Exploration Company, Limited except N. Asseltine an employee of Trans North Turbo Air.

SURVEY PROCEDURE AND NAVIGATION

A flight line base map of the survey area was prepared by enlarging a 1:50,000 N.T.S. topographic map to a scale of 1:25,000. Proposed flight lines and topographically located control points were plotted prior to flying the survey. During the survey, flight line path corrections were made by the navigator where necessary. Line information, control point locations and numbers, announced by the navigator, were recorded on stereo magnetic tape together with the VLF-EM data.

INSTRUMENTATION AND DATA RECORDING

The following instruments are installed in the helicopter for measuring and recording the geophysical data during flights.

a) Proton Magnetometer (ELSEC)

The magnetometer was manufactured by the Littlemore Scientific Engineering Co., Oxford, U.K. and is designated type 595. The magnetometer measures the total magnetic field at a 1 second cycle rate. The measurement is digitally displayed to one gamma and has an analog output of 100, 1000, and 10,000 gammas full scale. The 1000 gamma full scale output is normally used.

The toroidal wound detector is installed in a fibreglass "bird" towed beneath the helicopter on a 12 meter cable.

b) Electromagnetic Receiver (VLF-EM)

The VLF-EM receiver was manufactured by Sabre Electronic Instruments Ltd., Burnaby, B.C. The instrument has dual receivers tuned to 18.6 kHz (Seattle) and 21.4 kHz (Annapolis). Two omnidirectional antenna arrays are employed. They are mounted in the fibreglass "bird" also housing the magnetometer detector. The antenna arrays are designed to detect the horizontal magnetic component of the VLF fields. Signals originating from U.S. Navy transmitters near Seattle and Annapolis were utilized for this survey. The amplitudes of the horizontal component are measured continuously and displayed as relative field strengths. An analog output is provided for recording each measurement.

c) Recording System

Two recording systems were employed simultaneously during the survey.

1. Chart recorder, Model 7155B manufactured by Hewlett Packard is used to record the aeromagnetic data in profile form. The recorder has an event marker, controlled by the navigator to record control point locations. The points are numbered in flight by the operator.

2. The tape recording system consists of a Sony stereo cassette recorder Model TC 124 and a frequency modulator manufactured by Sabre Electronic Instruments Ltd. This system records both VLF-EM measurements on the left channel and all in flight conversation between pilot, navigator and operator on the right channel. The right channel also records an event tone (1000 kHz) controlled by the navigator to indicate control points locations.

High Fidelity cassette magnetic tapes (Phillips Type) are used to record the in-flight data and conversation.

d) Playback System

The playback system consists of a stereo cassette tape recorder (Sony TC 124), demodulator and 2 pen strip chart recorder (M.F.E. Model M-26). To retrieve the in-flight tape recorded data, the tapes are replayed, demodulated and the data is reproduced in profile form on the strip chart recorder. Playback is in real time and all voice recorded information, control points numbers and tones are written on the strip charts during playback.

e) Radar Altimeter

A Mark 10 radar altimeter, manufactured by Bonzar Inc. was installed to measure and display helicopter terrain clearance during the survey as an aid to the pilot in maintaining a constant aircraft clearance.

DATA REDUCTION AND PRESENTATION

All survey data are presented on a plan map at a scale of 1:25,000. Corrected flight line and control points are drawn and numbered. Flight line direction is indicated at the beginning of each line. The topographic contour map, used as a base map for the survey, is used as an underlay to allow ground positioning.

a) Aeromagnetic Data

The magnetic data is presented as isomagnetic contours of the total field as presented on the Magnetic Contour Map (Drawing No.1). Contour values are based on a datum of 57,000 gammas total magnetic field intensity. The results are not corrected for diurnal variations.

Magnetic values at 100 gamma intervals were picked on the in-flight profile recordings. These points were then transcribed to the flight line plan map with reference to the flight line and control points. The transcribed points of equal magnetic intensity were then contoured.

b) Electromagnetic Data (VLF-EM)

The recorded VLF-EM data measures the relative field strength (horizontal component). A significant conductive anomaly is indicated by a definitive increase in the field strength. Anomaly locations are corresponding to the profile width at the half height. The enclosed number within the bar represents the percent increase in relative field strength. The anomalous locations are transcribed to the flight line base as was described under aeromagnetic data.

DISCUSSION OF RESULTS

The results of the aeromagnetic survey, as plotted on the Magnetic Contour Map, show only modest relief with values ranging from 700 to 1200 gammas. Two magnetic features are evident and are characterized by an area of higher frequency magnetic relief in the south and a smooth magnetic gradient in the north. The 900 gamma contour generally divides these features along a NW-SE trend. Several magnetic low linears are evident, the two most prominent strike north from flight line number 13. A linear magnetic dipole is shown on flight line 45 and 46 in the vicinity of Coal Creek. A prominent magnetic high (300 gammas) is located on line 41. The pattern of this magnetic anomaly indicates a limited strike length in an east-southeast direction with a northerly dip.

The results of the VLF-EM survey indicate many anomalies at the VLF-EM frequency. The majority of anomalies only respond to the electromagnetic field radiating from Annapolis, Maryland. This selective response suggests these conductors have an easterly strike.

One anomaly (flight line 41) shows a strong response from both transmitters, Seattle and Annapolis, suggesting a south east strike.

Although many conductors are indicated they appear to group within well defined limits. One strongly conductive area is shown on flight lines 6 to 9, a second area between lines 23 to 25.

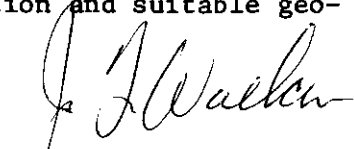
The prominent 300 gamma magnetic high has 5 associated conductive responses, three are positioned along the north and eastern gradients.

As an aid to interpretation and assessment of the VLF-EM anomalies, copies of the in-flight strip charts are presented. These show the relative horizontal component field strengths of each anomaly with the response from Transmitter - Seattle above transmitter Annapolis. The flight line direction and number are shown to assist in correlation with the anomaly locations depicted on the flight lines.

CONCLUSIONS AND RECOMMENDATIONS

The airborne Geophysical survey has provided data for the compilation of a low level aeromagnetic contour map showing many small and relatively weak magnetic features not detected by the G.S.C. Aeromagnetic series mapping.


The VLF-EM conductor groups should be investigated on the ground utilizing the VLF-EM method with appropriate VLF Transmitter and grid orientation together with geological investigation and suitable geochemical follow-up technique.


J.T. Walker
February 18, 1981

STATEMENT OF QUALIFICATIONS

I, James T. Walker of the City of Vancouver, Province of British Columbia do certify that:

1. I have been an employee of Noranda Exploration Company, Limited since May, 1958.
2. I have held the position of Geophysicist for Noranda Exploration Company, Limited, British Columbia since June, 1965.
3. I am a member of the Canadian Institute of Mining and Metallurgy.
4. I am a member of the Canadian Exploration Geophysical Society.
5. I am a member of the British Columbia Geophysical Society.



J. T. Walker
Geophysicist
Noranda Exploration Company, Limited

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT CASSIAR CREEK DATE JUNE 24, 1981
TYPE OF REPORT AIRBORNE SURVEY

a) Wages:

No. of Days 16
Rate per Day \$ 102.1769
Dates From: Oct/80 to Feb/81
Total Wages 16 x \$102.1769 1,634.83

b) Food and Accomodation:

No of days 16
Rate per day \$ 9.1625
Dates From: Oct/80 to Feb/81
Total Cost 16 x \$ 9.1625 146.60

c) Transportation:

No of days 16
Rate per day \$ 211.5925
Dates From: Oct/80 to Feb/81
Total Cost 16 x \$ 211.5925 3,385.48

d) Instrument Rental:

Type of Instrument
No of days
Rate per day \$
Dates From:
Total Cost X \$

Type of Instrument
No of days
Rate per day \$
Dates From:
Total Cost X \$

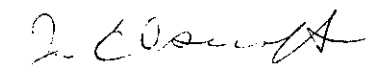
- f) Analysis
(See attached schedule)

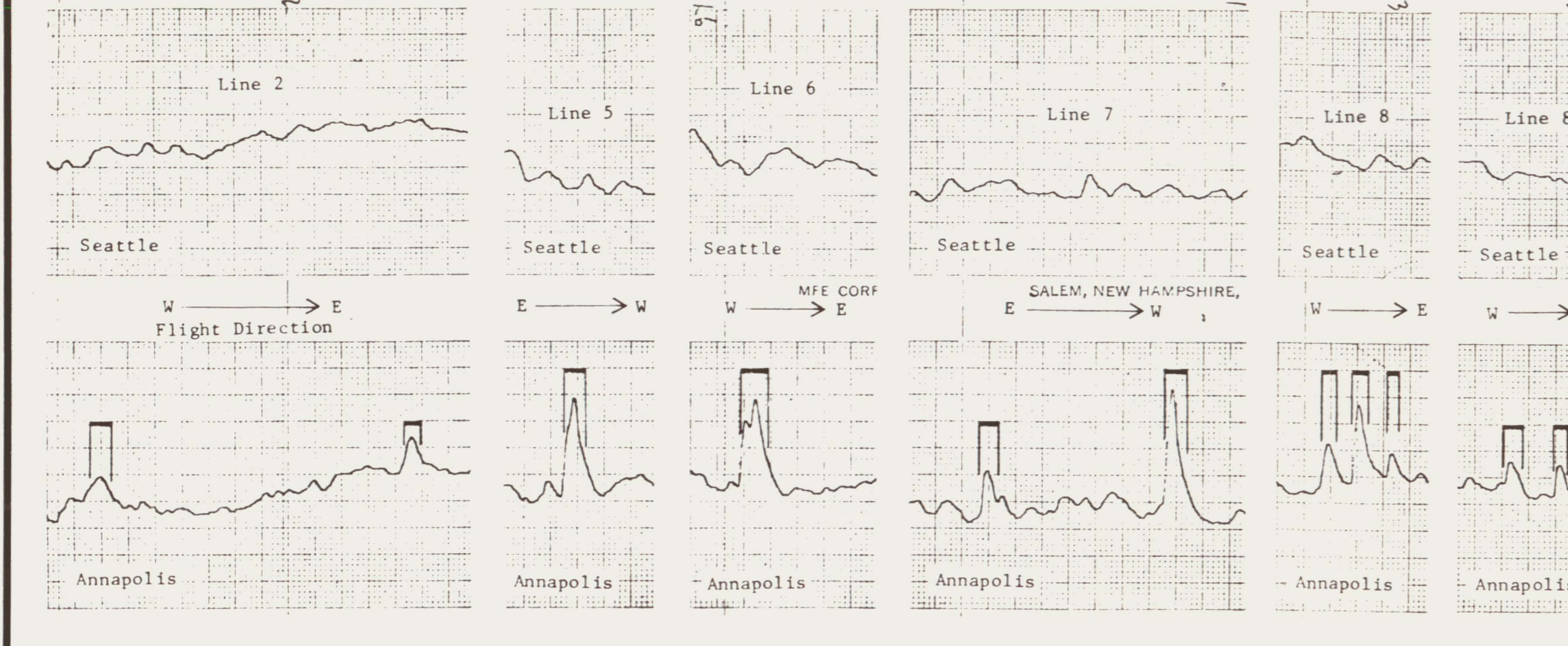
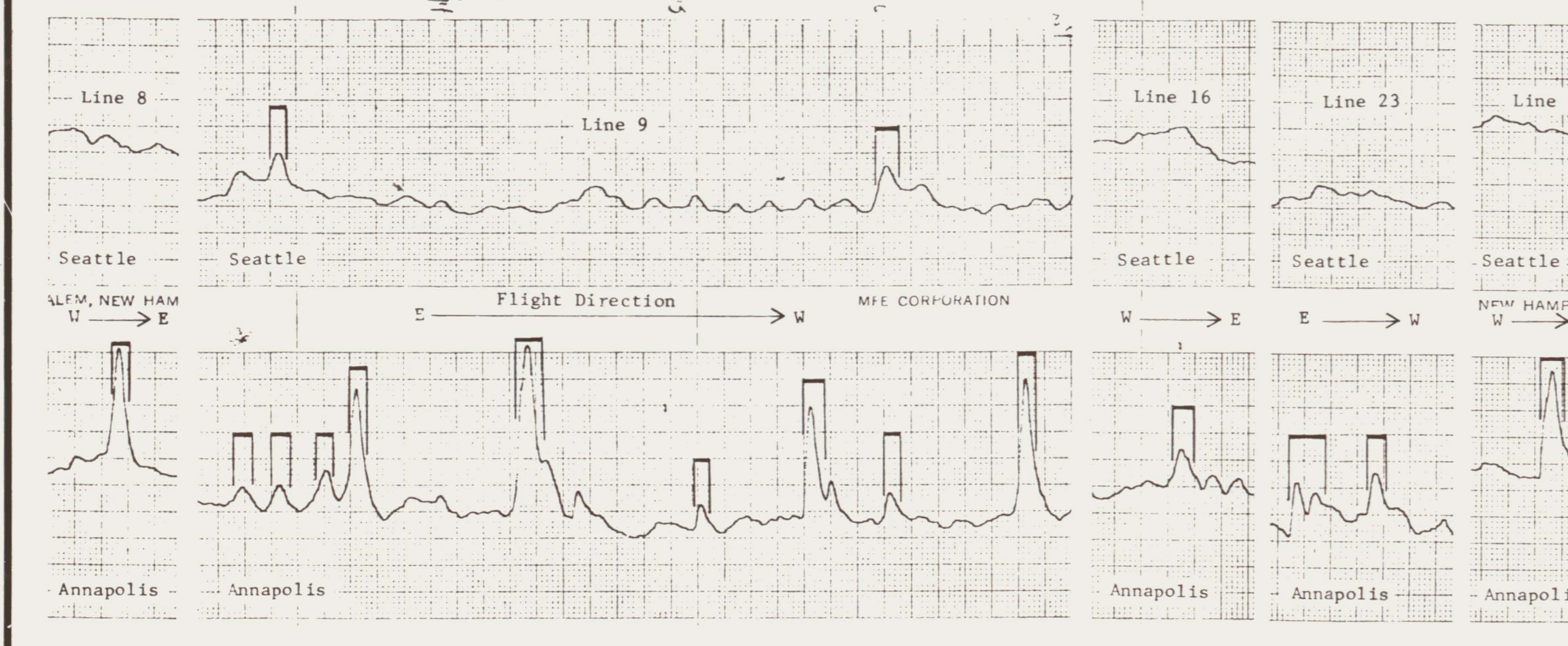
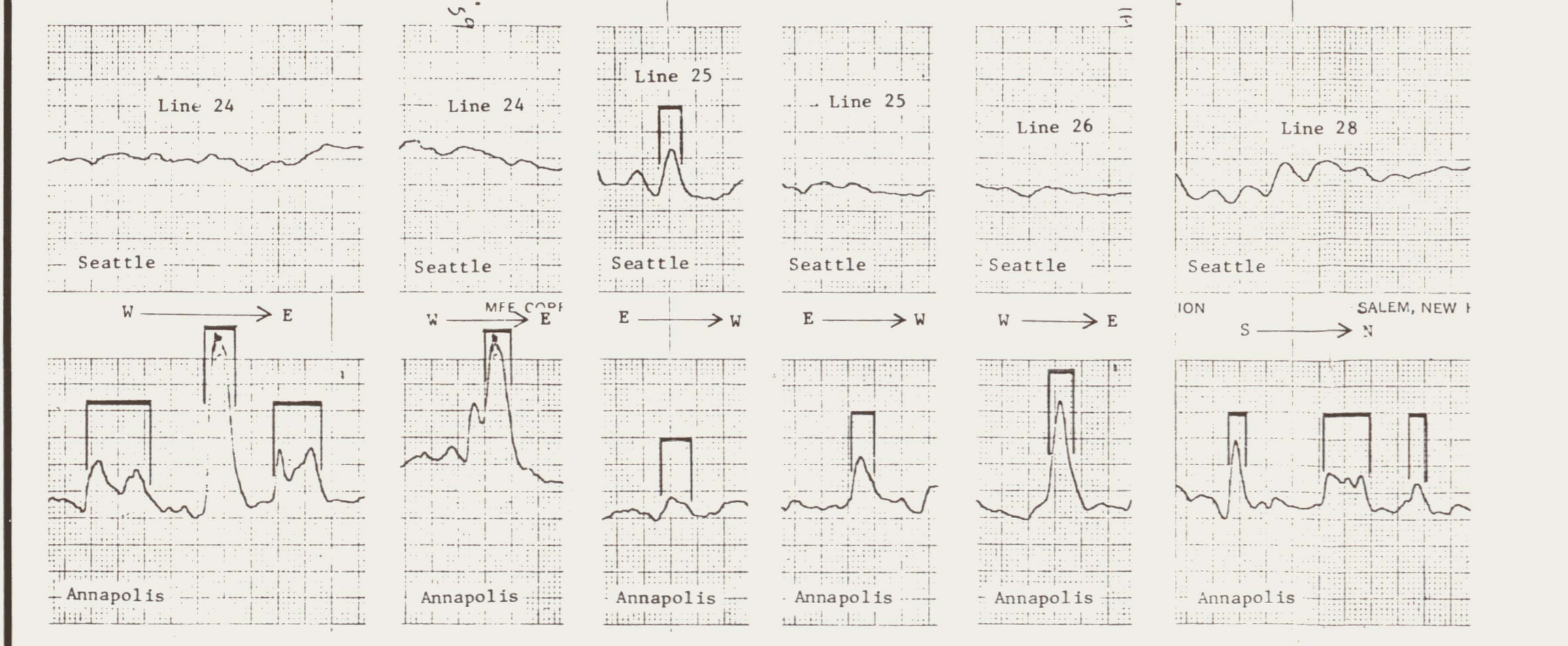
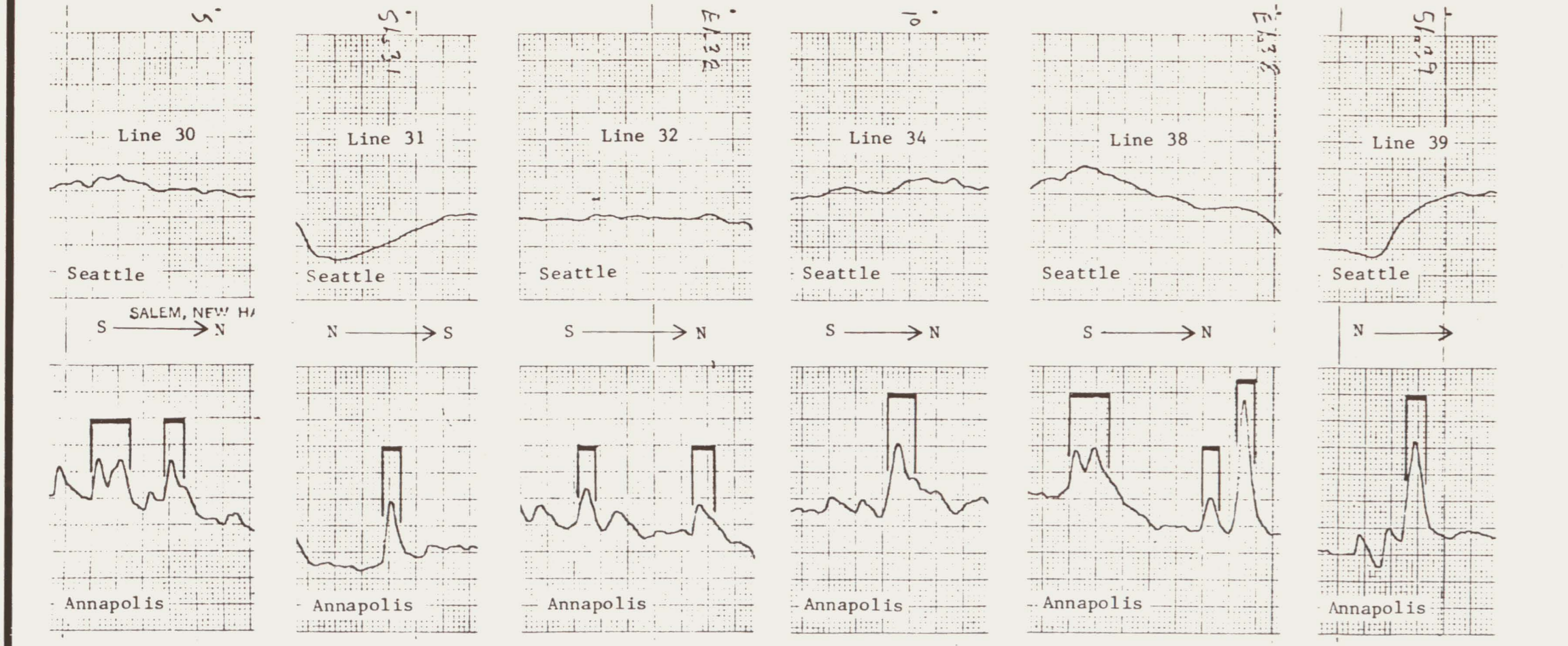
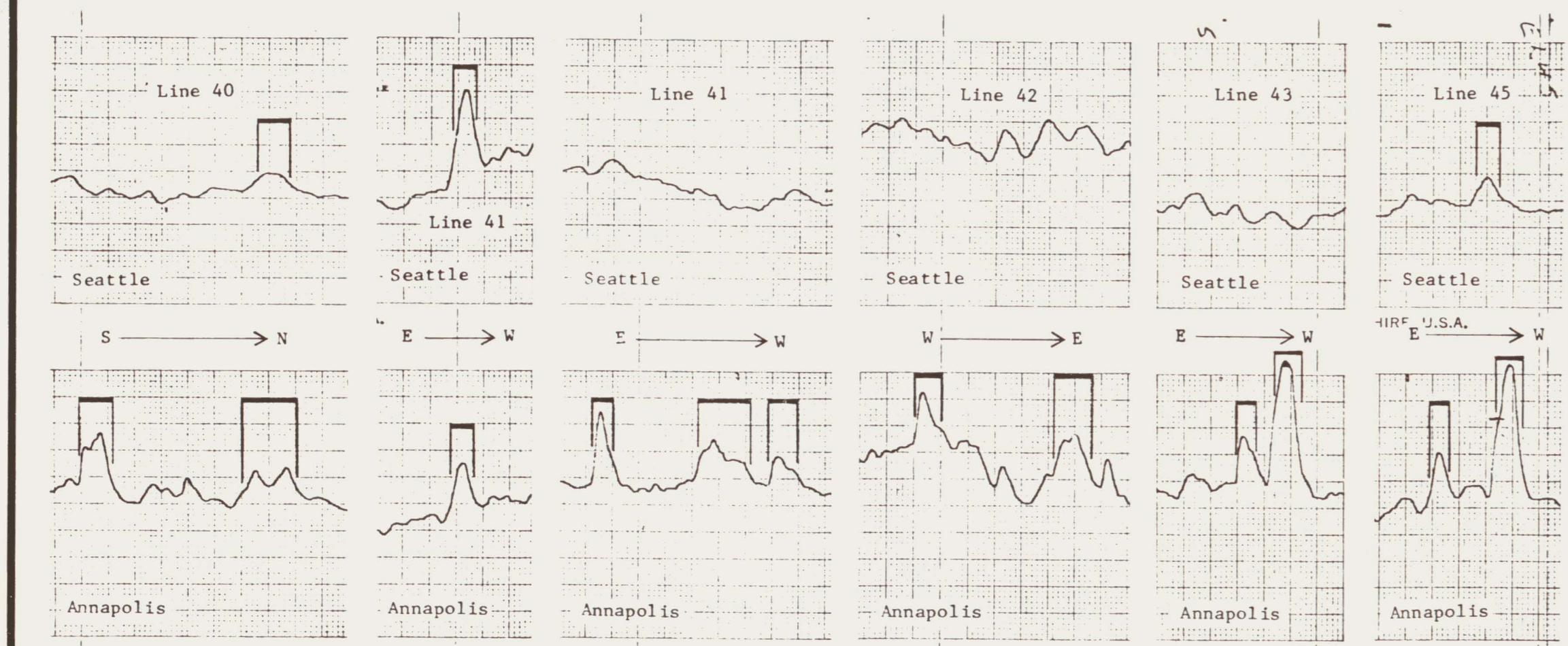
- g) Cost of preparation of Report
 - Author 204.36
 - Drafting 752.68
 - Typing 102.18

- h) Other:

Total Cost \$6,226.13

I certify this statement to
be correct

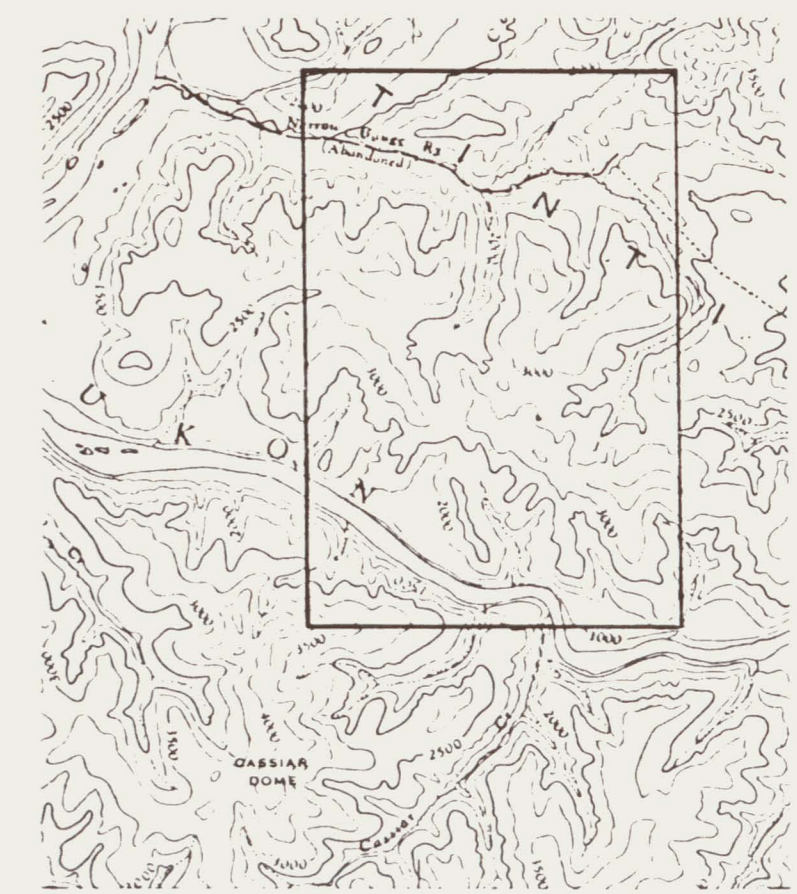

J.E. Oscroft - Br. Accountant



VLF-EM CHARTS
SHOWING FIELD STRENGTH ANOMALIES



MAGNETIC CONTOUR MAP
1:25,000



LOCATION MAP
116 C 8 1:250,000

LEGEND

L3 → 10 Flight line number and direction, numbered control point.

Magnetic measurement is total field.
Reference level - 57,000 nanoteslas.
Contour interval - 50, 100, and 500 nT

VLF-EM measurement - Field Strength (horizontal component)
Transmitters - Seattle Annapolis

VLF-EM Anomaly showing % F.S. increase

ROAD and RAIL CLAIM GROUP

REVISED	CASSIAR CREEK AIRBORNE
	MAGNETOMETER & VLF-EM SURVEY
	TERRAIN CLEARANCE - 60 Meters
	FLIGHT LINE SPACING - 400 Meters
PROJ. No.	SURVEY BY: T. WALKER R. MCINTYRE DATE: OCTOBER 1980
N.T.S. 116 C 8	DRAWN BY: T. WALKER SCALE: 1:25,000
DWG No.	NORANDA EXPLORATION
	OFFICE: VANCOUVER

J.J. Walker
February 18, 1981