

# 5198

93A/11W, 12E #5198

A Geophysical - Geochemical Report

on the Cedar

Cedar Creek Group

Likely Area, Cariboo Mining Division

for

# 93A/11W&12W

Union Carbide Exploration Corporation  
(owner and operator)

by

R. D. Westervelt, M.Sc., P. Eng.

Westervelt Engineering Ltd.

#904 - 1112 West Pender Street.

Vancouver, B.C.

4 October 1974.

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT

NO. **5198** MAP

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## A Geophysical - Geochemical Report

on the

## Cedar Creek Group

INTRODUCTION

The Cedar Group of claims was optioned by Union Carbide Exploration Corporation from John M. McAndrew in the spring of 1974. Current exploration interest in the property has been derived from some old, unpublished, placer gold records suggesting a possible auriferous sulphide zone in bedrock underlying the claim group.

The present report outlines the preliminary exploratory work completed on the property during the summer of 1974 in attempting to locate and define the suspected sulphide zone.

PROPERTY

The Cedar Group held by Union Carbide Exploration Corporation consists of a contiguous block of 19 full and fractional mineral claims in the Cariboo Mining Division of British Columbia as follows:

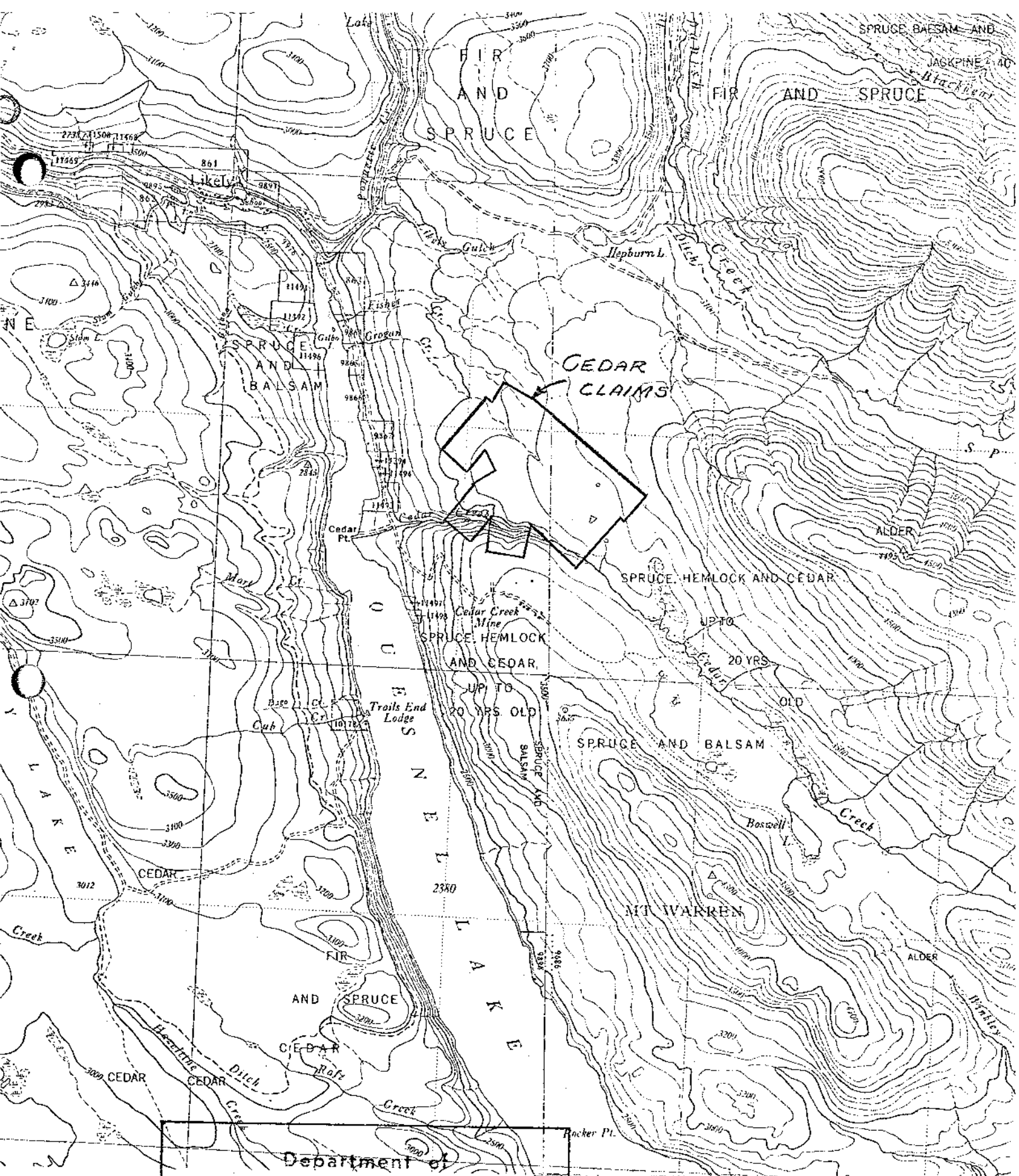
<u>Claim Name</u>	<u>Record No.</u>	<u>Expiry Date</u>
Cedar 5 Fr.	67957	October 5, 1974
Cedar 6-11 (incl.)	67958-63 (incl.)	October 5, 1974
Cedar 12 Fr.	68631	October 5, 1974
Cedar 16, 17	68635-68636	March 9, 1975
Cedar 19	68638	" "
Cedar 21	68640	" "
Cedar 23	68642	" "
Cedar 25	68644	" "
Cedar 27	68646	" "
Cedar 1-4 (incl.)	71494-97 (incl.)	February 27, 1975.

The actual boundary of the Cedar Group remains uncertain as some marginal overlap on preceding claims is probable along the west and to the south. The true location and legality of these prior mineral claims remains largely unknown.

LOCATION AND ACCESS

The Cedar Group covers the headwaters of Grogan Creek (originally known as Beaver Creek) immediately northeast of Cedar Creek some 3 miles southeasterly from the village of Likely, B.C.

Likely is connected to Highway 95 at Williams Lake by 30 miles of gravel road and a network of bush roads provides local access from the village to the immediate claim area.



FIR  
AND  
SPRUCE

FIR AND SPRUCE

SPRUCE BALSAM AND  
 JACKPINE

**CEDAR  
CLAIMS**

SPRUCE  
AND  
BALSAM

SPRUCE, HEMLOCK AND CEDAR

SPRUCE, HEMLOCK  
AND CEDAR,  
UP TO  
20 YRS. OLD

SPRUCE AND BALSAM

MOUNT WARREN

AND SPRUCE

CEDAR

ALDER

Department of

Mines and Petroleum Resources  
 ASSESSMENT REPORT

Union Carbide Exploration Corporation  
 Cedar Claim Group

NO. **5198** MAP **#1**

LOCATION MAP

Scale: 1" = 1 mile

## HISTORY

The Cedar Creek area has a limited, intermittent placer gold production history dating back to the early 1900's. Although some substantial amount of gold has probably been produced, no reliable records are available as much of the production was from small individual leases.

In 1931-32, many of the individual leases were obtained by Cedar Creek Placer Gold Company Ltd., and an overburden drilling program was commenced to determine the gold values in the gravels in the vicinity of the present Cedar claims. Along one of these drill profile lines, several consecutive holes in the vicinity of Grogan Creek are reported to have terminated in shattered, iron-stained, sulphide-bearing, bedrock over a length of 700 feet. Although previous government reports had suggested a possible local source for the placer gold at Cedar Creek, the operators were primarily interested in placer material and this potential source in bedrock remained untested.

Overburden is extensive throughout the area and little hardrock activity has been indicated over the years. A few minor gold occurrences in shears have been reported southeasterly from the claims and several gold bearing quartz veins have been investigated on Spanish Mountain 4 miles to the east. The closest outcrops to Grogan Creek are located along the Canyon of Cedar Creek one mile to the west. In this area, an auriferous sulphide showing with appreciable gold values was earlier reported (B.C. Ann. Rpt. 1923, p. 131).

## GENERAL FIELD PROGRAM

The Cedar claims are situated on a level plateau at an elevation of 3000' above sea level. With the exception of the 800' deep canyon of Cedar Creek along the western boundary, the topography is flat - drainage is poorly developed and much of the area is swampy. No outcrops are present east of the Cedar Creek canyon.

From the available placer records, the probable location of the bedrock "sulphide" zone was estimated in the vicinity of Grogan Creek and a limited grid was established to cover the immediate area. The base-line was run parallel to the regional strike along Grogan Creek and cross lines were cut at 400' intervals with stations at 100' spacings along the lines. A total of 9.1 miles of grid cutting was completed.

Magnetic and induced polarization profiles were then run along selected grid lines to locate and define any potential bedrock sulphide areas and geochemical soil sampling was completed over the entire grid.

Field work was carried out during the period May 7th - 31st, 1974 by Union Carbide field personnel. Program management was under the direction of Louis Bell, staff geologist, and the geophysical equipment was operated by David Bowen.

## GEOPHYSICAL PROGRAM

1. **Magnetics:** Magnetic profiles were obtained using a Sharpe MF-1 (vertical field) fluxgate magnetometer with readings being taken at 100' stations along the lines. To ensure a constant base level, all readings were corrected for drift and variation by regular comparison with a base reference station.

A total of 5.9 miles of magnetic traversing was completed and the results are presented in profile form on accompanying Figure 7.

2. **Induced Polarization:** 5.5 miles of profiling using a "time domain" I.P. system were completed along selected lines in the central grid area. Survey instrumentation consisted of a standard Huntco 2.5 kw. transmitter driven by a Briggs and Stratton 8 hp. motor-generator and a Crone IP-IV receiver. As utilized in this survey, the pulse period was - two seconds on (positive), two seconds off, two seconds on (negative), two seconds off.

The current electrodes consisted of single stainless steel bars about 3 feet long, hammered into the ground. During the survey, the high voltage of the transmitter was maintained at 2200 volts. The current varied from approximately one half to one ampere with a resulting power input into the ground varying from 1.1 to 2.2 kws. With this range, the primary voltage at the receiver seldom dropped below 30 mv. and the resulting chargeabilities were well above noise levels and accurately reproducible.

The potential electrodes were porous pots filled with saturated copper sulphate solution. Contact with the ground was obtained by scraping a shallow hole at each station through to the A or B soil horizon. Throughout the survey, no problem was encountered in obtaining good electrical contacts for both the current and potential electrodes.

For standard coverage, a three array probe configuration was utilized in surveying the grid area from line 40 NW through to line 64 NW. 100 and 200 foot "a" spacings were used throughout and an additional spacing of 50' was completed on line 56 NW.

A portion of line 56 NW was also profiled using a dipole-dipole array with a spacing of 100' and "n" values of 1, 2, 3, and 4.

3. **Survey Interpretation:** The measured chargeability and resistivity values and the calculated metal factors (chargeability divided by resistivity) are presented in profile form on the accompanying Figures 3, 4 and 5. The additional dipole-dipole data on line 56 NW is included in Figure 6.

As shown on these profiles, a moderate to strongly anomalous I.P. zone is present paralleling the baseline and extending from 0+00 to approximately 15+00 NE on all of the grid lines. Although complex in character, the individual profiles exhibit remarkable continuity along strike from line to line. Notably, changes in "a" spacing result in only minor amplitude changes and shift displacements in the separate profiles.

In detail, the anomalous I.P. area consists of two sub-parallel zones of high chargeability separated and flanked by areas of higher resistivity. These features are best illustrated on the Metal Factor Profiles (Fig. 5) where a strong broad anomaly is indicated at approximately 13+00 NE on lines 44 NW through to 64 NW. A distinct but narrower and lower order anomaly is indicated from lines 48 NW to 64 NW lying slightly east of the base-line. Southeastward, these two anomalies appear to converge in the vicinity of line 44 and then die out - no metal factor anomaly is present along the southeastern-most line (40 NW). Both anomalies are distinct on line 64 NW and the anomalous zone remains open to the northwest.

The western anomaly centered at 2+00E on line 56 NW correlates reasonably well with the suspected sulphide zone reported from the earlier placer drilling. The eastern and stronger anomaly corresponds with a bedrock trough indicated further to the east along the same drill profile section.

Magnetic profiles on the grid are relatively flat and indicate no direct magnetic association with the anomalous I.P. areas. On the basis of contrasting relief - flat to the northeast and relatively more ragged to the southwest, an irregular contact between differing rock units can be postulated cutting through the grid area west of the stronger I.P. anomaly. This interpretation is supported to a large extent by the corresponding resistivity data.

The western-most I.P. anomaly co-inciding with the suspected sulphide zone has chargeabilities in the order of 6 times background with corresponding pronounced resistivity lows. The character and position of the anomaly change very little with varying electrode array and spacing suggesting either a very flat or very steep dipping non-magnetic sulphide source under shallow overburden. The indicated width (100'-150') is narrower than implied by the original drill section (700') suggesting that only a portion of the bedrock source is contributing to the anomalous I.P. response.

The eastern anomaly co-inciding with a bedrock trough rises to 9 times background with extreme resistivity lows over widths up to 800'. The anomaly characteristics are consistent with a steeply dipping fault zone with considerable vertical extent buried under some 75' of cover. Although the clay in the overburden, fault gouge and electrolyte solutions in the sheared rock may be enhancing the anomalous response, the inherent chargeabilities suggest the structure is widely, if not heavily, mineralized.

#### GEOCHEMICAL PROGRAM

The Cedar claims are covered by extensive but generally shallow overburden. As indicated from the placer drilling, the cover consists of sand, gravel and clay averaging some 10' in depth with some local bedrock troughs in excess of 60 feet.

Drainage is generally poor and much of the area is swampy. Where feasible, soil samples were taken at 100' intervals along the line throughout the entire grid area. A total of 414 samples were obtained and analyzed geochemically for copper, arsenic and mercury.

1. Field Procedure: At each sample location, the twig and humus layer up to 5" thick was scraped away and a hole was dug with a mattock to obtain satisfactory B horizon material. In most cases, reasonable B soil was obtained at a depth of 10"-12". Care was taken to exclude humus material but in the swampy areas, only highly organic samples were possible in many cases.

The sample material collected by mattock was placed in a standard Kraft geochem envelope with the grid location being marked in pencil on the exterior.

2. Analytical Procedures: All the samples were analyzed geochemically for copper, arsenic and mercury under the supervision of Ken Bright at the Bondar-Clegg Laboratories in North Vancouver.

All the samples were placed in a drying cabinet for 24 hours and then screened and sifted to obtain a minus 80 mesh fraction for analysis.

The content in parts per million of each sample was then determined for each element as follows:

- (a) copper
  1. 0.5 gm was digested in aqua regia for 3 hours.

2. Following digestion, each sample was bulked to 20% acid concentration and homogenized.

3. After settling, copper content was determined by atomic absorption in constant comparison with both synthetic and matrix standards.

- (b) arsenic
  1. 0.1 gm. was digested in  $\text{HNO}_3\text{-HClO}_4$ .

2. As reduced and exsolved as arsine gas.

3. Complexed with Ag-DEDTC in pyridine.

4. Content determined colourimetrically by comparison with both synthetic and matrix standards.

- (c) mercury
  1. 0.5 gm. digested cold overnight in oxidizing medium then digested in hot aqua regia.

2. Mercury reduced by addition of stannous chloride.

3. Content determined by atomic absorption by comparison with both synthetic and matrix standards.

3. Survey Interpretation: The geochemical results are presented on plan maps on a scale of 1" = 400' showing the copper/arsenic (Fig. 8) and mercury (Fig. 9) contents in parts per million. Frequency distribution diagrams were prepared for each element to determine the anomalous values and these are shown on each of the respective plans.



As determined from the frequency curves, anomalous values for copper, arsenic and mercury are limited to a scatter of sharp individual peaks and no significant anomalous areas are present for any of the elements. There is no obvious inter-relationship between the three elements and none reflect any definite association with the anomalous I.P. zones.

One series of samples on line 36 NW in the vicinity of 21+00 NE is anomalous in all three elements but this area is very swampy and all are probably due solely to the high organic content.

The lack of geochem response from the I.P. anomalies may have resulted from the poor drainage and the blanketing effect of clay horizons in the overburden. This may be particularly true over the eastern I.P. anomaly where a bedrock trough is indicated and overburden probably exceeds 60 feet in depth.

#### CONCLUSION

The initial geophysical investigation has defined two sulphide-type I.P. anomalies on the Cedar claims in close proximity to the zone reported earlier from the placer drilling. The lack of geochemical response may very possibly be due to the poor drainage development and blanketing clay cover.

Further testing of these I.P. anomalies is warranted to determine whether these are caused by auriferous sulphides which may represent the local bedrock source of the placer gold in the Cedar Creek area. As some considerable surface leaching at the bedrock surface can be anticipated, diamond drilling of the anomalies should be considered rather than conventional bulldozer trenching.

Respectfully submitted

WESTERVELT ENGINEERING LTD.

*R. D. Westervelt, P. Eng.*

R. D. Westervelt, P. Eng.,



Vancouver, B.C.  
4 October 1974.

Appendix I: Statement of exploration expenditures

CEDAR CREEK CLAIM GROUP

Exploration expenditures during the period May 7th to May 31st, 1974, by Union Carbide Exploration Corporation.

<u>Name</u>	<u>Work</u>	<u>Dates Worked</u>	<u>No. of days</u>	<u>Salary</u>
L. Bell	Program Manager	May 7-21, 28-31	19 days	\$950.00
D. Bowen	Geophysical Operator	May 13-31	19 days	950.00
D. Artmont	Geophysical surveys	May 13-31	19 days	590.00
M. De Quadros	Linecutting, soil sampling and geophysical surveys	May 7 - 31	25 days	1250.00
G. Malnis	"	May 7 - 30	24 days	750.00
T. Rehtlane	"	May 7 - 21	15 days	465.00
R. Black	"	May 7 - 21	15 days	500.00
G. Diakow	"	May 7-21, 28-31	19 days	700.00
J. Grimes	Claim survey	May 28-31	4 days	<u>200.00</u>
			Total payroll	6355.00

General Expenses

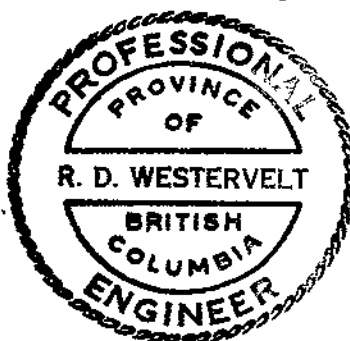
Magnetometer rental	\$ 100.	
IP rental	900.	
Truck rentals (2) and gasoline	1200.	
Meals and Lodging	<u>2300.</u>	
	\$4500.	<u>4500.00</u>

Total Expenditures

\$10855.00

*R.D. Westervelt, P. Eng.*

R.D. Westervelt, P. Eng.,  
for  
Union Carbide Exploration Corporation





WESTERVELT ENGINEERING LTD.

#904 - 1112 WEST PENDER STREET.

DEPT. OF MINES  
PETROLEUM RESOURCES

VANCOUVER, B.C. V6E 2S1

Mr. E. J. Bowles,  
Chief Gold Commissioner,  
Mineral Resources Branch,  
Department of Mines and Petroleum Resources,  
Victoria, B.C.

12810

Dear Ted,

Re: CEDAR Group of Mineral Claims  
Geochemical-Geophysical Report #5198  
(Your file No. 166 - Cariboo)

D.M.			
AGG (M)			
AGG (P)			
CCO	✓		
CEA			
CCIC			
ACPR			
G.C.			
ACCIS			
PFOL			
INDP			
H. RES			
EC. & P.			

Thank you for your letter of November 19th, regarding the above-noted report.

FILED CLERK

You are quite correct and diligent in noting my error in the mercury geochem results reported - the mercury values are in parts per billion rather than in ppm as shown. This change does not affect the interpretation of the data but the shift in the decimal point certainly reduces the incidence of falling hair in Likely!

The arsenic values as shown are correct - they are, in fact, in parts per million.

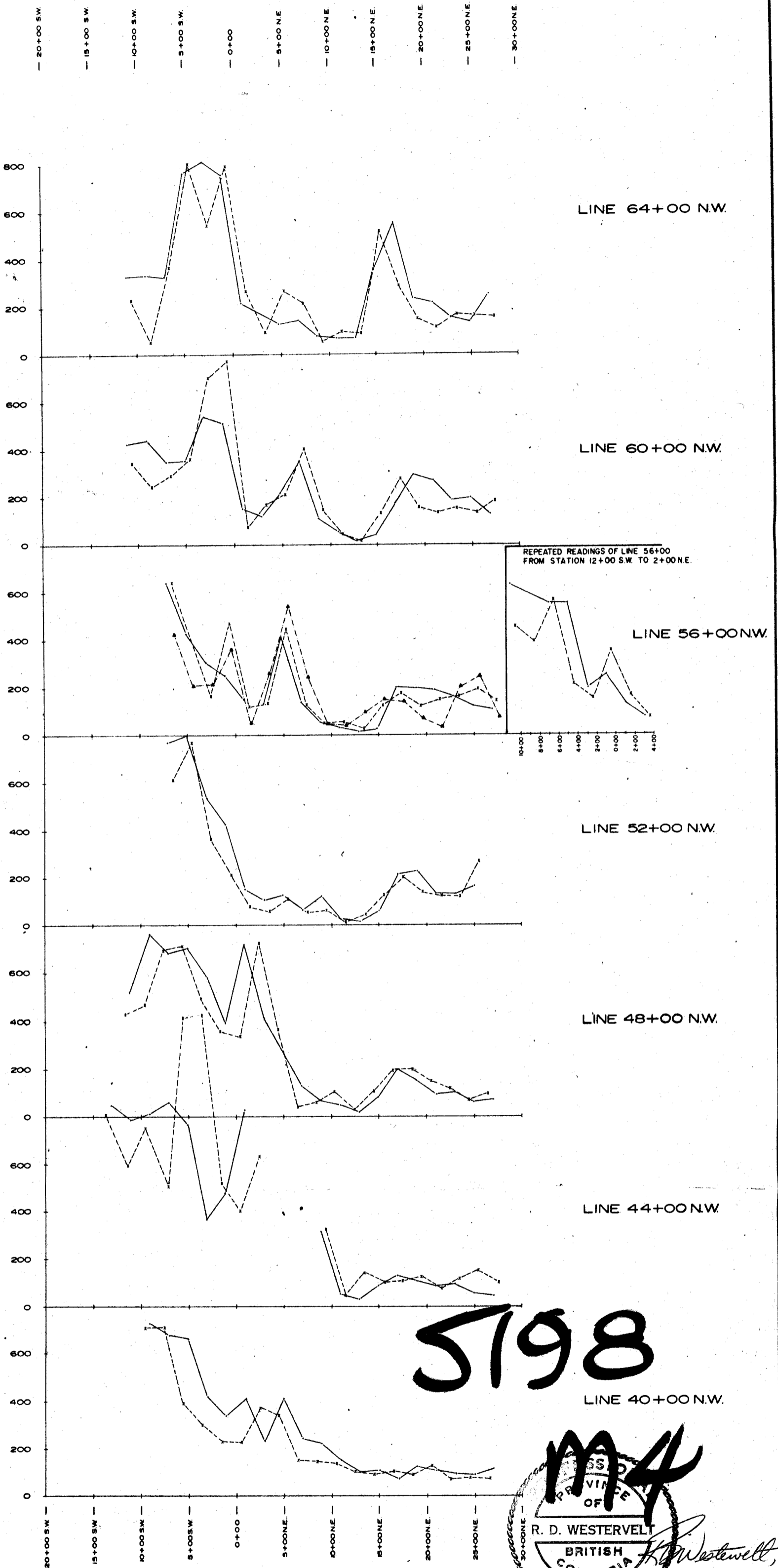
I note your comment regarding the claim survey and that your approval for \$10,600 can be anticipated rather than the original expenditure amount of \$10,800. In actual fact, I have only requested credit for \$7,600. expenditure for assessment filing so the differential is not critical. However, I do have one small point to make - the differential of \$200. is obviously the 4 days itemized for J.Grimes on "claim survey." Perhaps my terminology is wrong and this should have been listed under grid survey but in fact this work was an inherent and critical part of the total exploration program. By your own regulations it is necessary to show the claim positions in relation to the grid and from the company standpoint it is necessary that they know their exploration work is being carried out on ground on which they hold valid mineral title. As this area had been staked and re-staked many times over a considerable period of years, a complex mineral rights problem could have existed. Considerable time and effort was therefore required to ascertain a reasonable approximation of the exterior property boundary which was dependent on preceding peripheral claims. Although I realize the map produced has no legal implication, it did serve to satisfy the company that they had sufficient ownership assured to warrant continued exploration expenditures. In cases where such survey work is an essential part of an overall exploration program, the total sum is nominal, and the work is diligently and competently carried out, I suggest an expenditure credit is warranted.

Once again, I apologize for my error with regard to the mercury results and appreciate your having brought this to attention.

Yours very truly,  
*R. D. Westervelt, P. Eng.*  
R. D. Westervelt, P. Eng.

c.c. Mining Recorder, Quesnel, B.C.  
Union Carbide Exploration Corp.,

OHM-METERS



5198

MA  
 R. D. WESTERVELT  
 BRITISH COLUMBIA  
 ENGINEER  
*R.D. Westervelt, P. Eng.*

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. **5198** MAP #4

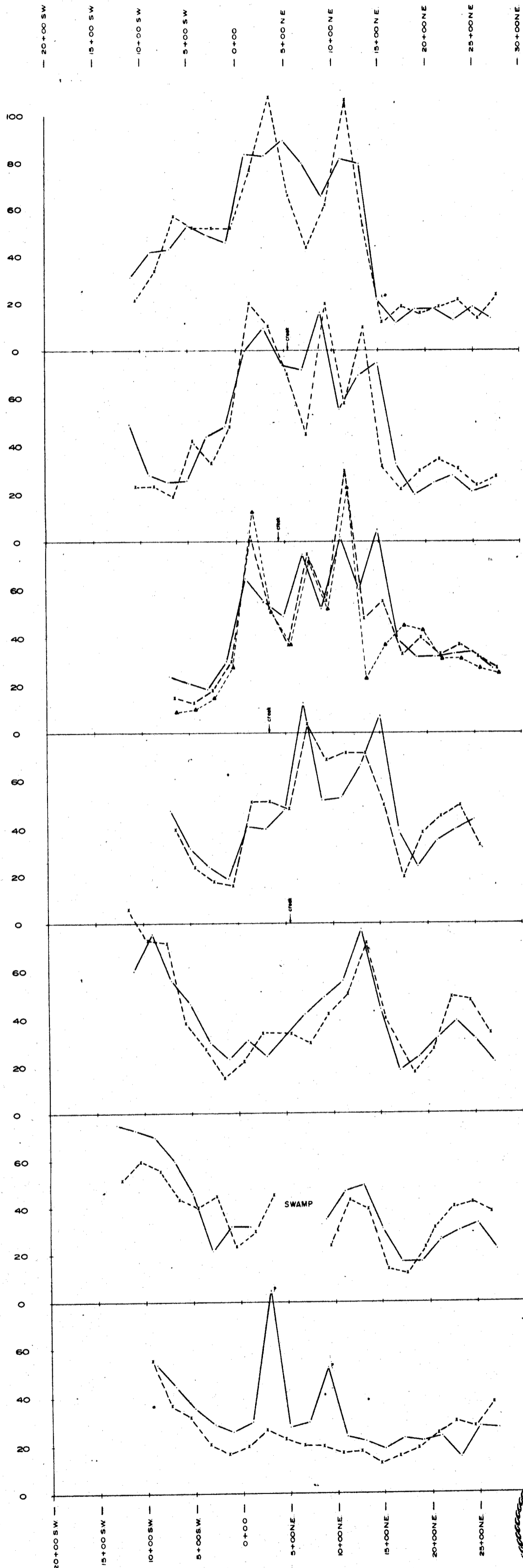
LEGEND  
 — READINGS USING 200' SPACINGS  
 - - - READINGS USING 100' SPACINGS  
 - · - · READINGS USING 50' SPACINGS

WESTERVELT ENGINEERING LTD.  
 UNION CARBIDE EXPLORATION  
 CEDAR CREEK GROUP  
 INDUCED POLARIZATION SURVEY  
**RESISTIVITY PROFILES**  
 SCALE AS SHOWN  
 SEPT. 23, 1974

To accompany a Geophysical, Geochemical Report on the Cedar Creek Group, Cariboo M.D., by R.D. Westervelt, P. Eng. Dated October 4, 1974

FIGURE 4

MILLISECONDS



LINE 64+00 N.W.

LINE 60+00 N.W.

LINE 56+00 N.W.

LINE 52+00 N.W.

LINE 48+00 N.W.

LINE 44+00 N.W.

LINE 40+00 N.W.

5198  
M3

**LEGEND**

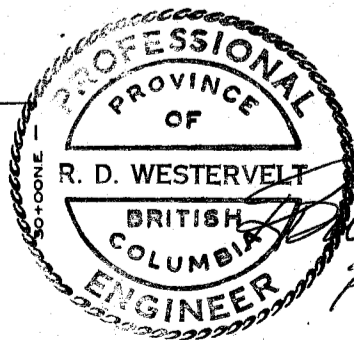
— READINGS USING 200' SPACINGS

- - - READINGS USING 100' SPACINGS

· · · · · READINGS USING 50' SPACINGS

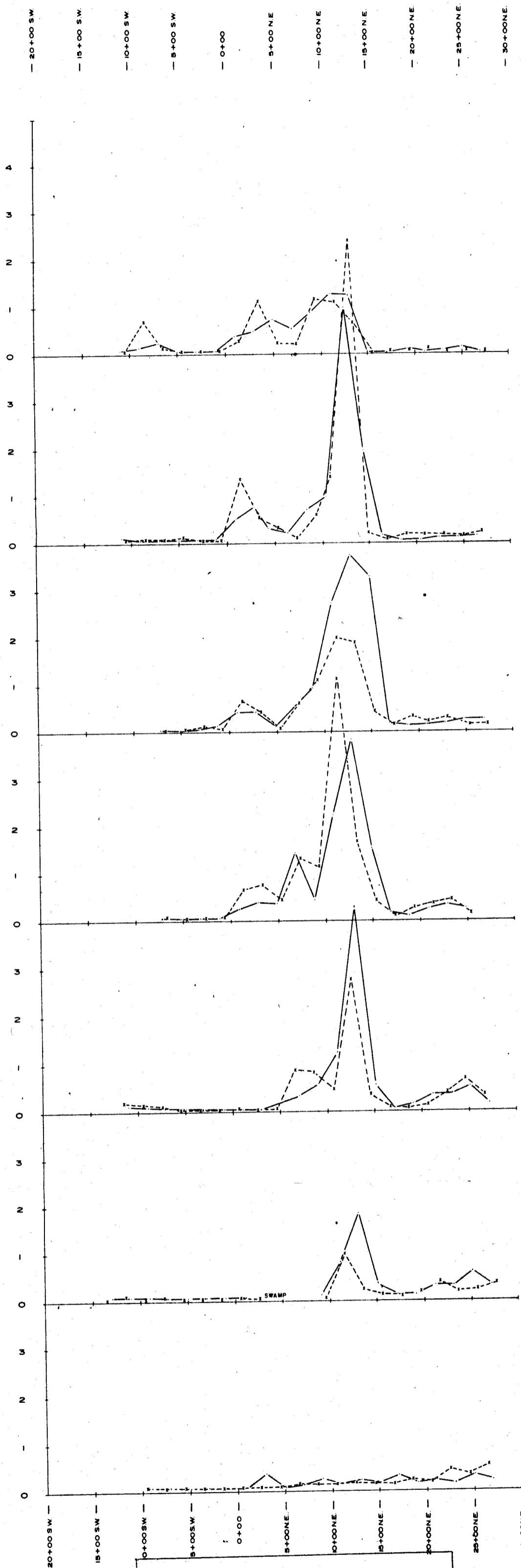
Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
No. **5198** MAP **#3**

To accompany a Geophysical, Geochemical Report on the  
Cedar Creek Group, Cariboo M.D., by R.D. Westervelt, P. Eng.  
Dated October 4, 1974



WESTERVELT ENGINEERING LTD.  
UNION CARBIDE EXPLORATION  
CEDAR CREEK GROUP  
INDUCED POLARIZATION SURVEY  
**CHARGEABILITY PROFILES**  
SCALE AS SHOWN  
SEPT. 23, 1974 FIGURE 3

MILLISECONDS / OHM-METERS



LINE 64+00 N.W.

LINE 60+00 N.W.

LINE 56+00 N.W.

LINE 52+00 N.W.

LINE 48+00 N.W.

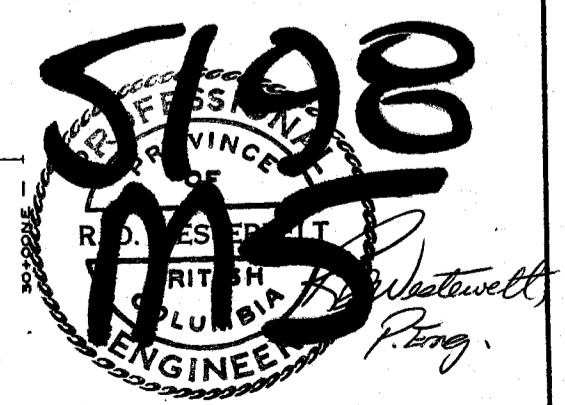
LINE 44+00 N.W.

LINE 40+00 N.W.

LEGEND  
 - - - - - READINGS USING 200' SPACINGS  
 - · - · - · READINGS USING 100' SPACINGS

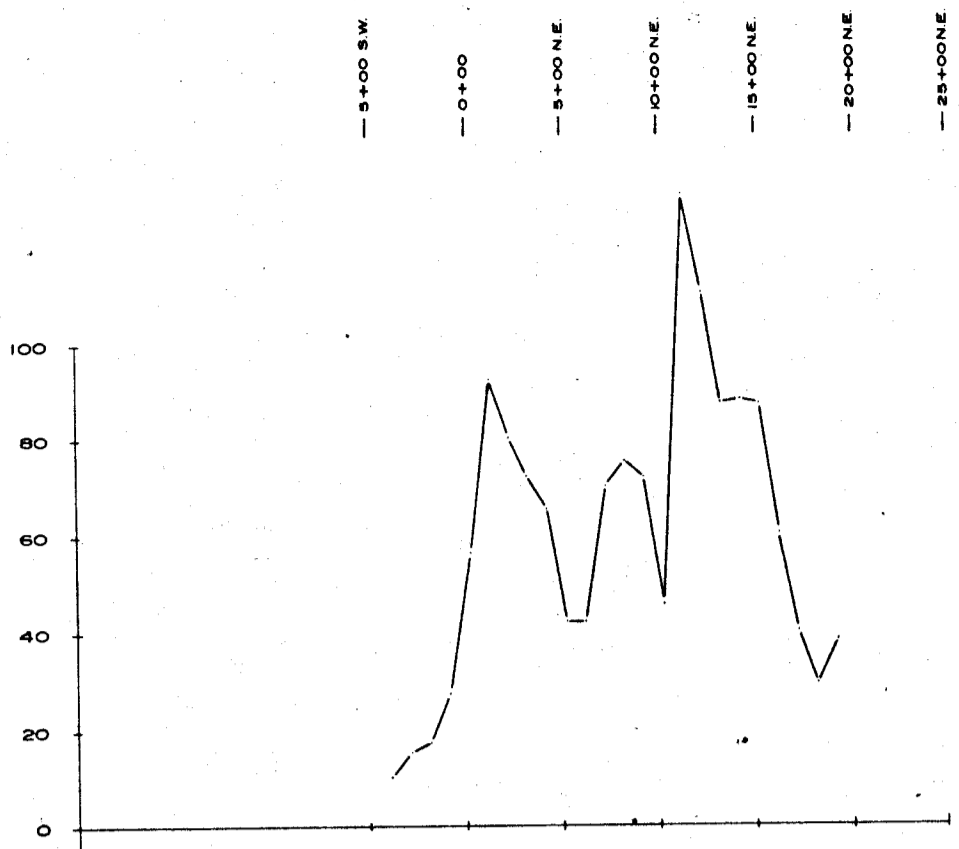
Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. **5198** MAP **#5**

To accompany a Geophysical, Geochemical Report on the  
 Cedar Creek Group, Cariboo MD, by R.D. Westervelt, P. Eng.  
 Dated October 4, 1974

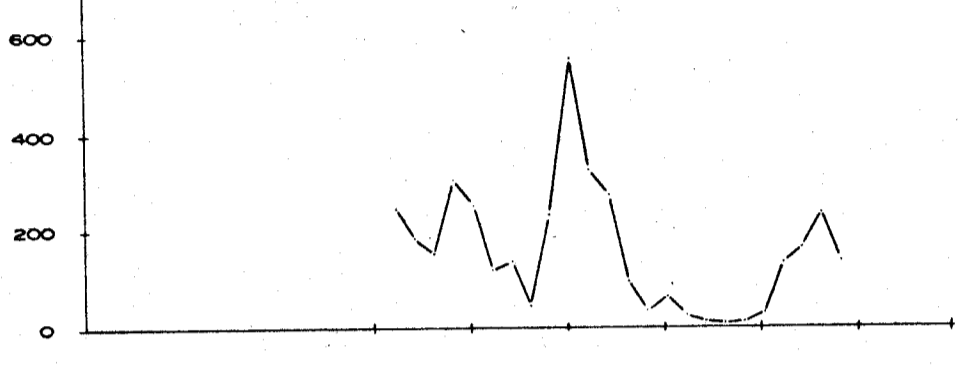


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 CEDAR CREEK GROUP  
 INDUCED POLARIZATION SURVEY  
**METAL FACTOR PROFILES**  
 SCALE AS SHOWN  
 SEPT. 23, 1974

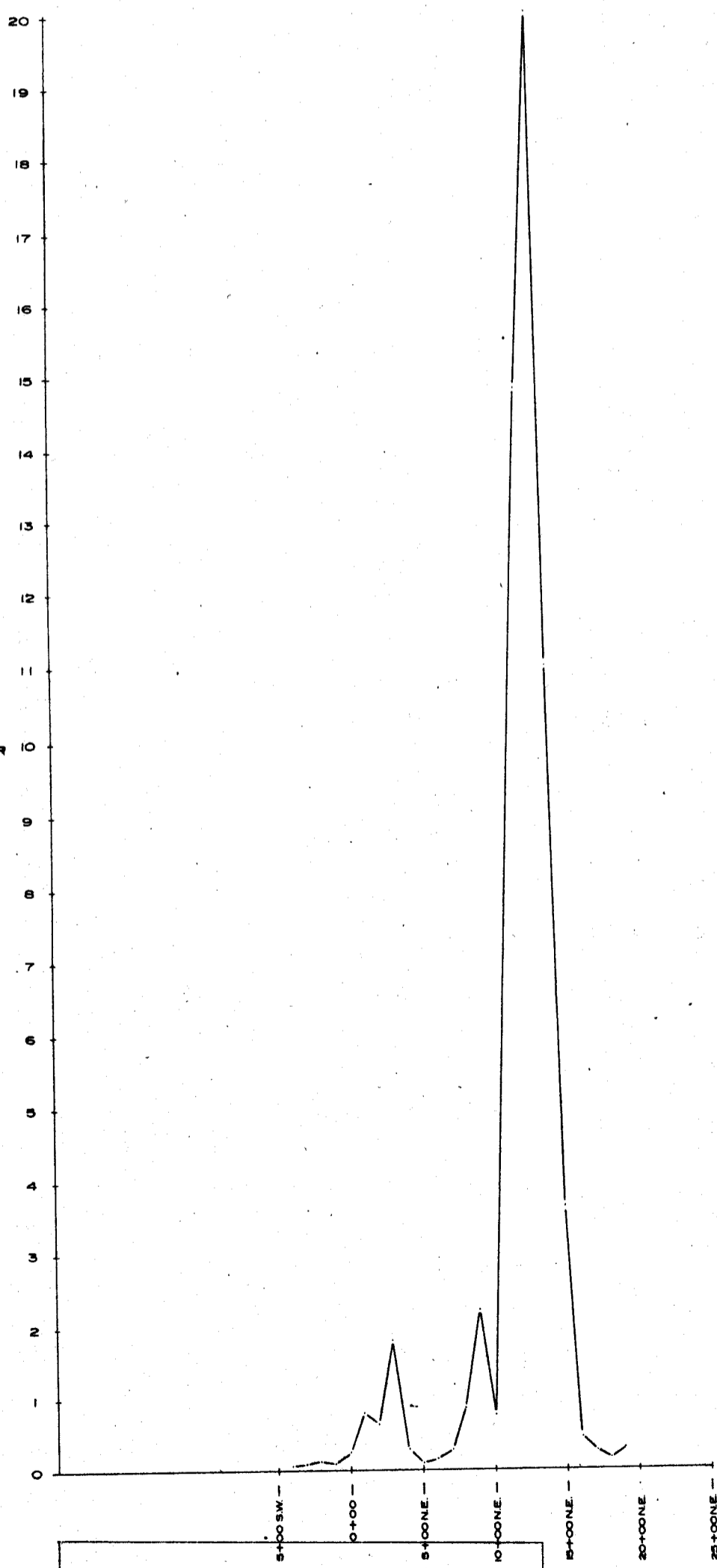
CHARGEABILITY  
MILLISECONDS



RESISTIVITY  
OHMMETERS



METAL FACTOR  
MILLISECONDS / OHMMETER



Department of  
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ASSESSMENT REPORT

NO. **5198** MAP # **6**

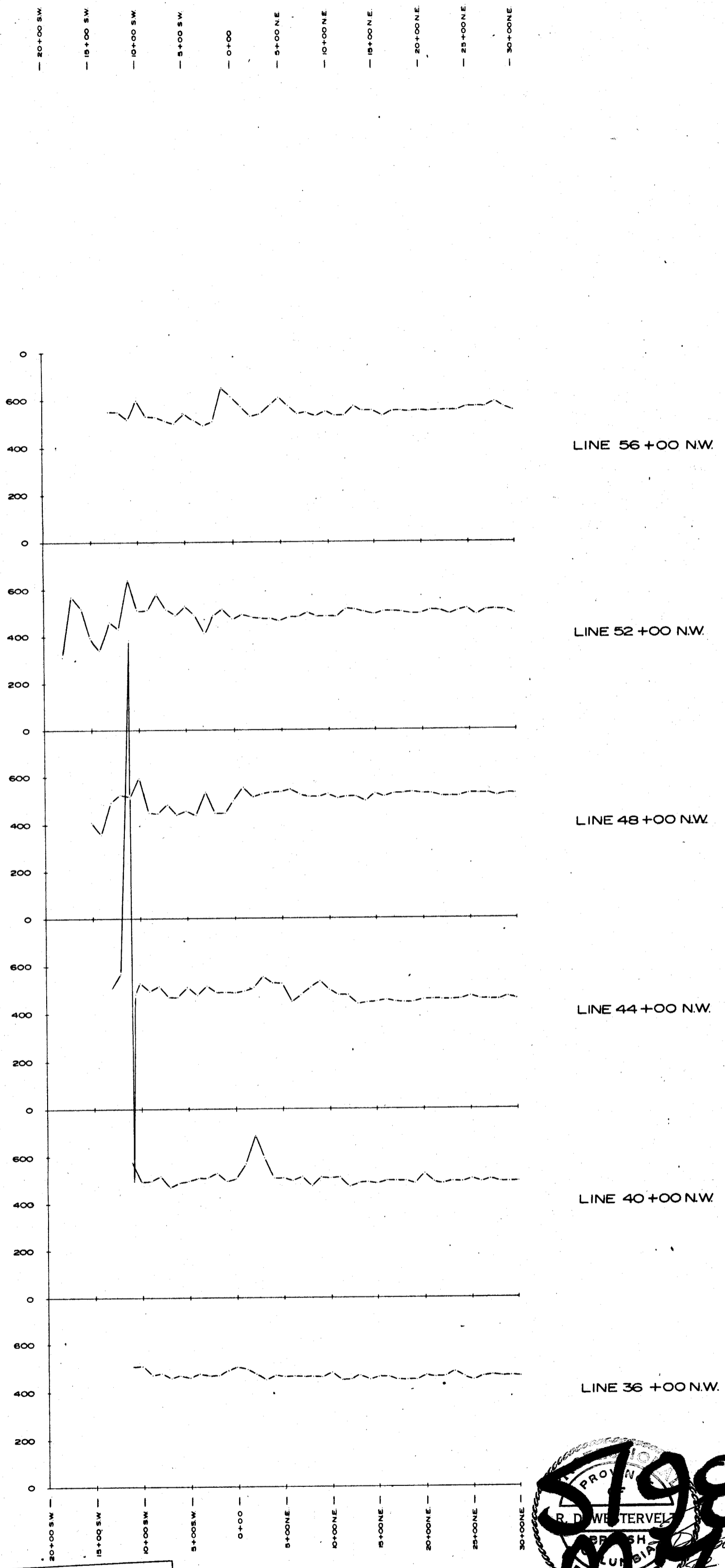
To accompany a Geophysical, Geochemical Report on the  
Cedar Creek Group, Cariboo M.D., by R.D. Westervelt, P. Eng.  
Dated October 4, 1974

**5198**  
**MTD**  
PROFESSIONAL  
ENGINEER  
BRITISH COLUMBIA  
R.D. WESTERVELT  
P. Eng.

WESTERVELT ENGINEERING LTD.  
UNION CARBIDE EXPLORATION  
CEDAR CREEK GROUP  
INDUCED POLARIZATION SURVEY  
LINE 56 + 00 NW  
PROFILES OF DIPOLE-DIPOLE DATA  
(n = 2)  
SCALE AS SHOWN  
SEPT. 23, 1974

FIGURE 6

GAMMAS



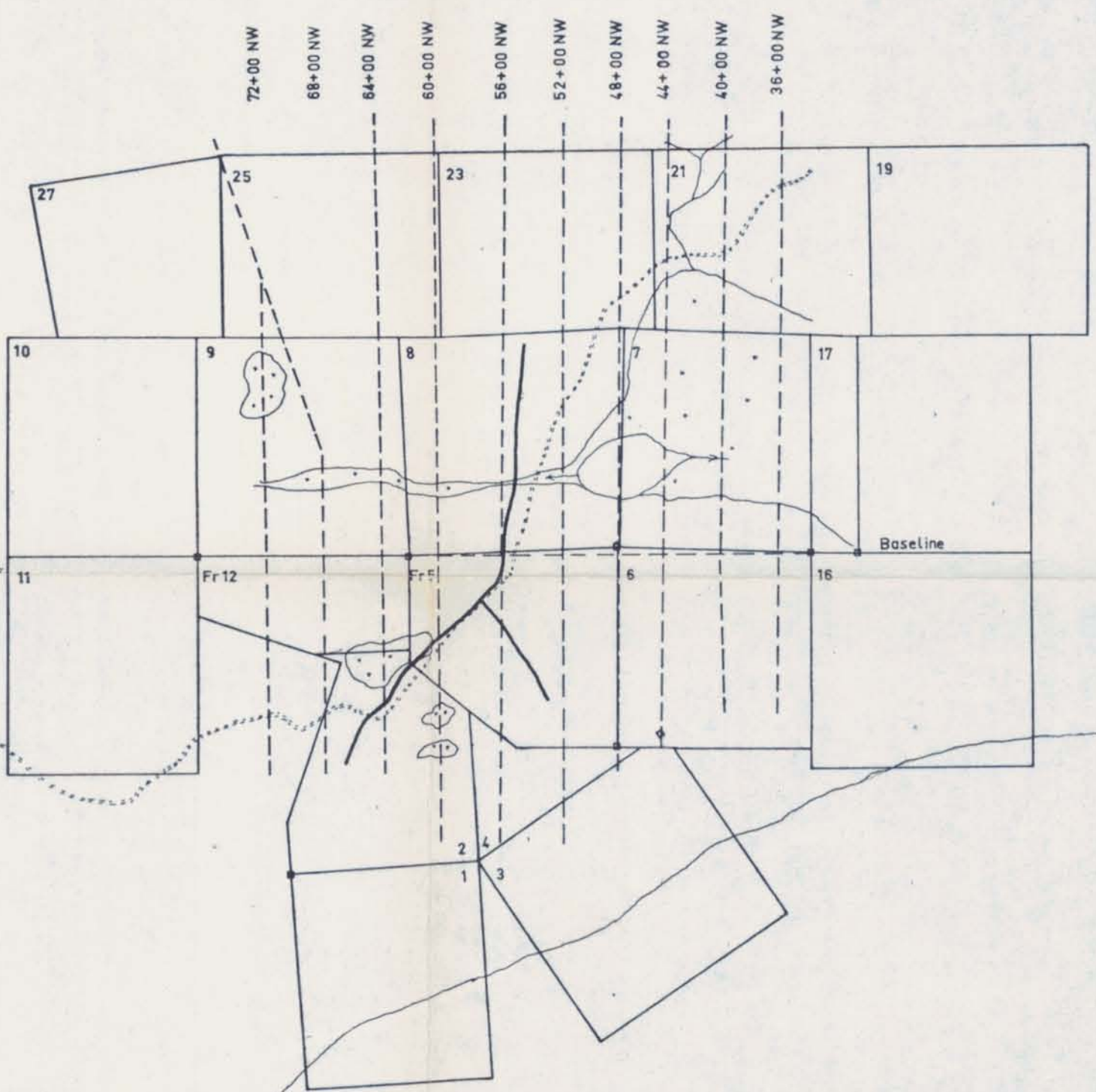
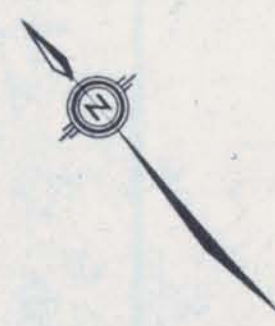
5198  
 R. D. WESTVELT  
 ENGINEER  
 STEWELL

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 5198 MAP #7

NOTE: INSTRUMENT USED SHARPE VERTICAL  
 FIELD FLUXGATE MAGNETOMETER  
 To accompany a Geophysical, Geochemical Report on the  
 Cedar Creek Group, Cariboo M.D., by R.D. Westervelt, P. Eng  
 Dated October 4, 1974

WESTERVELT ENGINEERING LTD.  
 UNION CARBIDE EXPLORATION  
 CEDAR CREEK GROUP  
**MAGNETIC PROFILES**  
 SCALE AS SHOWN  
 SEPT. 23, 1974  
 FIGURE 7





21080  
13000

QUESNEL  
LAKE

CEDAR  
CREEK



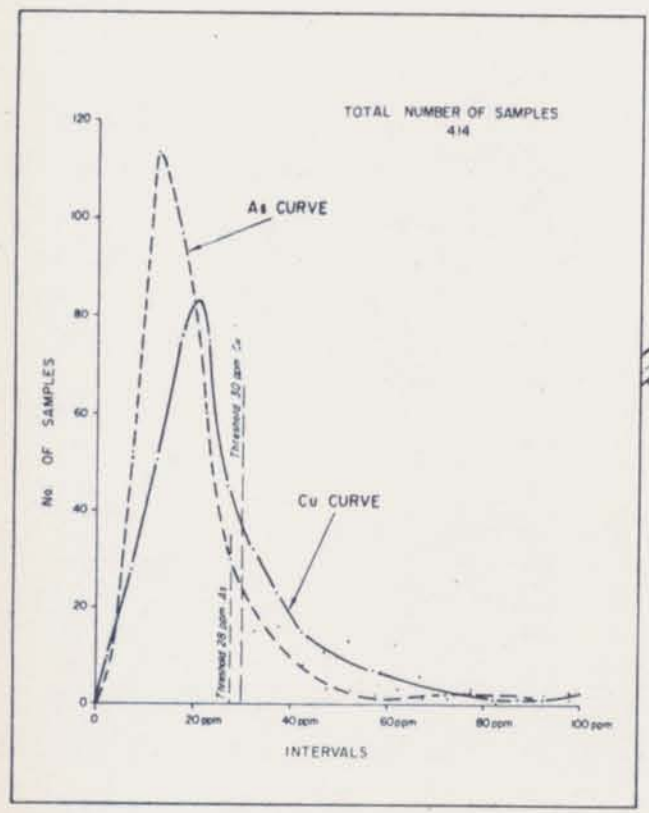
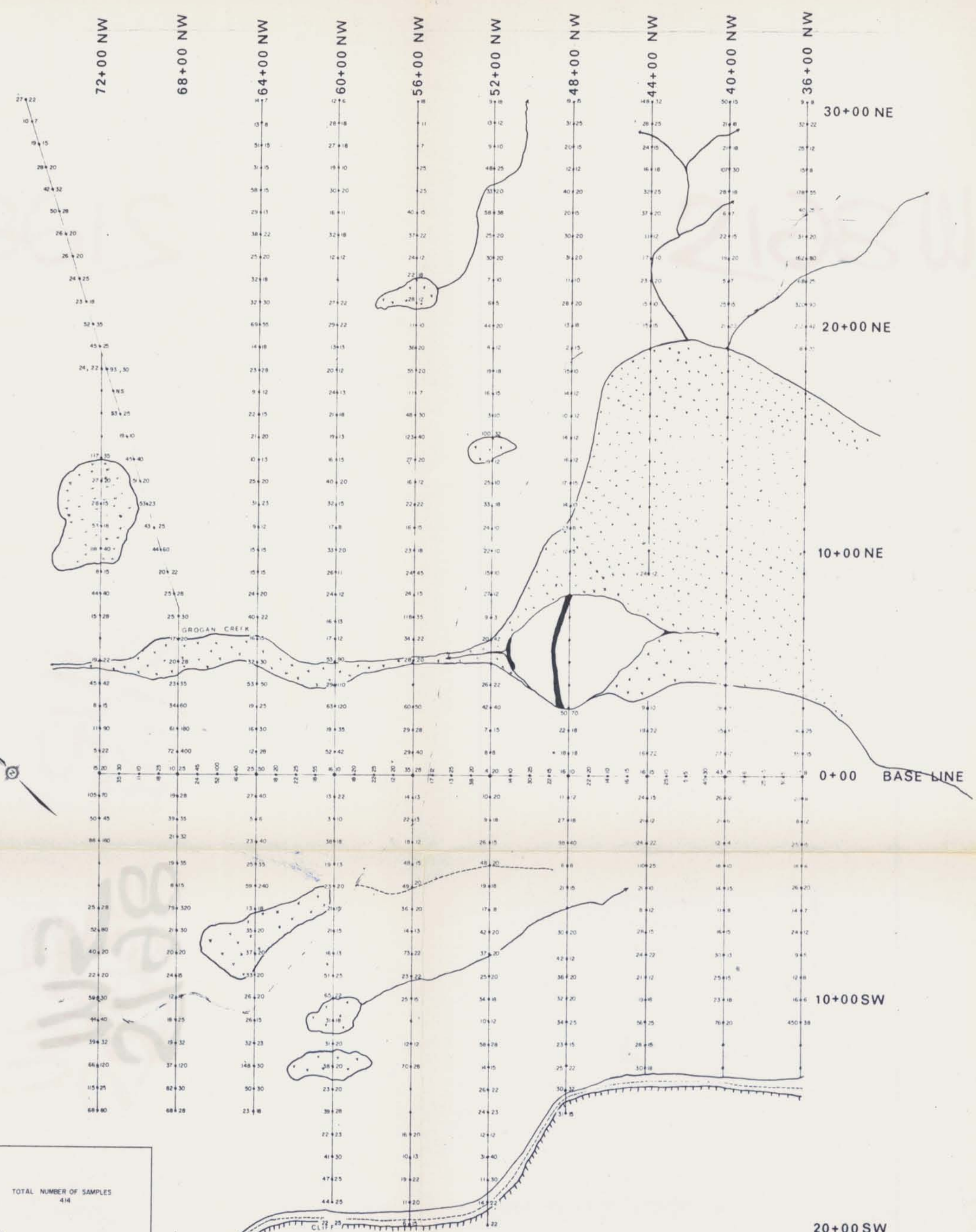
*R. D. Westervelt, P. Eng.*

To accompany a Geophysical-Geochemical  
Report on the Cedar Creek Group, Cariboo MD  
by R. D. Westervelt, P. Eng. dated Oct 4/74

5198  
M2  
Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 5198 MAP #2

UNION CARBIDE EXPLORATION CO
CEDAR CLAIM GROUP
CLAIM MAP SHOWING 1974 GRID
DATE Sept. 1974

Figure 2



Department of  
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NO. **5198** MAP #8

**5198 M8**



LEGEND	
	SWAMP
	LAKE & DAM
	CREEK
	ROAD
	PATH
	CUT LINE
	BASE STATION
	SAMPLE STATION



WESTERVELT ENGINEERING LTD.  
UNION CARBIDE EXPLORATION  
CEDAR CREEK GROUP

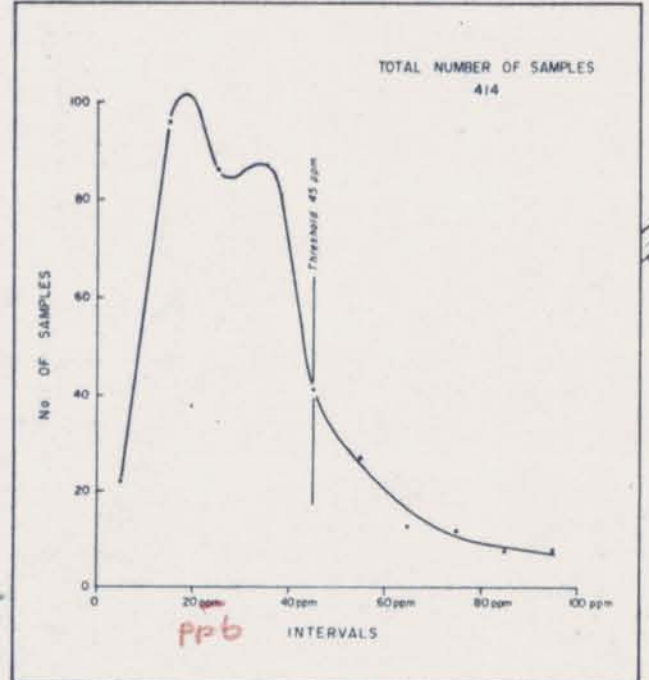
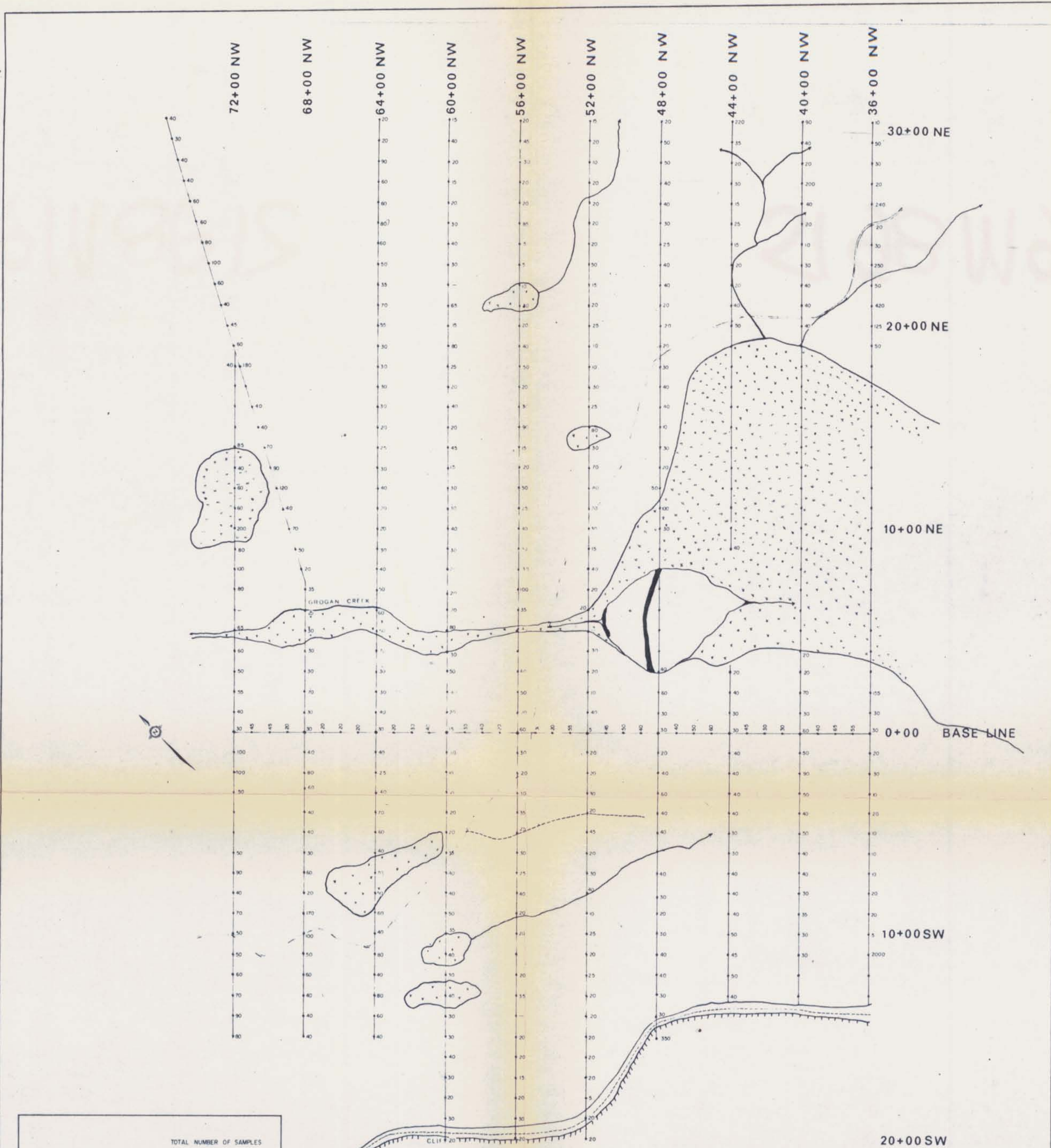
*Cu, As SOIL GEOCHEM.*

SCALE  
FEET 200 0 200 400 600 FEET

SEPT 23, 1974

To accompany a Geophysical, Geochemical Report on the Cedar Creek Group, Carlsbad M.D., by R.D. Westervelt, P.Eng. (dated October 4/74)

FIGURE 8



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. **5198 #9** MAP

**5198 M9**

PROFESSIONAL  
ENGINEER  
R. D. WESTERVELT  
COLUMBIA UNIVERSITY

LEGEND	
	SWAMP
	LAKE & DAM
	CREEK
	ROAD
	PATH
	CUT LINE
	BASE STATION
	SAMPLE STATION

WESTERVELT ENGINEERING LTD.  
UNION CARBIDE EXPLORATION  
CEDAR CREEK GROUP

**Hg SOIL GEOCHEM.**

SCALE  
FEET 200 0 200 400 600 FEET

SEPT 23, 1974

In company a Geophysical, Geochemical Report on the Cedar Creek Group, Corboe M.D., by R.D. Westervelt, P.Eng. Dated October 4, 74.

FIGURE 9