5383

1974

GEOPHYSICAL REPORT

102I/9E

ON

THE PUP I CLAIM GROUP

(PUP CLAIMS 29-34, 65-69, 85, AND PUP FRACTIONS 1 AND 2)

LOCATED ON

NORTHERN VANCOUVER ISLAND, B.C.

IN THE

NANAIMO MINING DIVISION

APPROXIMATELY

6 MILES N OF HOLBERG

FOR

CITIES SERVICE MINERALS CORPORATION

WORK BY

MORRISON AND DE PAOLI

GEOPHYSICAL CONTRACTORS & CONSULTANTS

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ILLUSTRATIONS

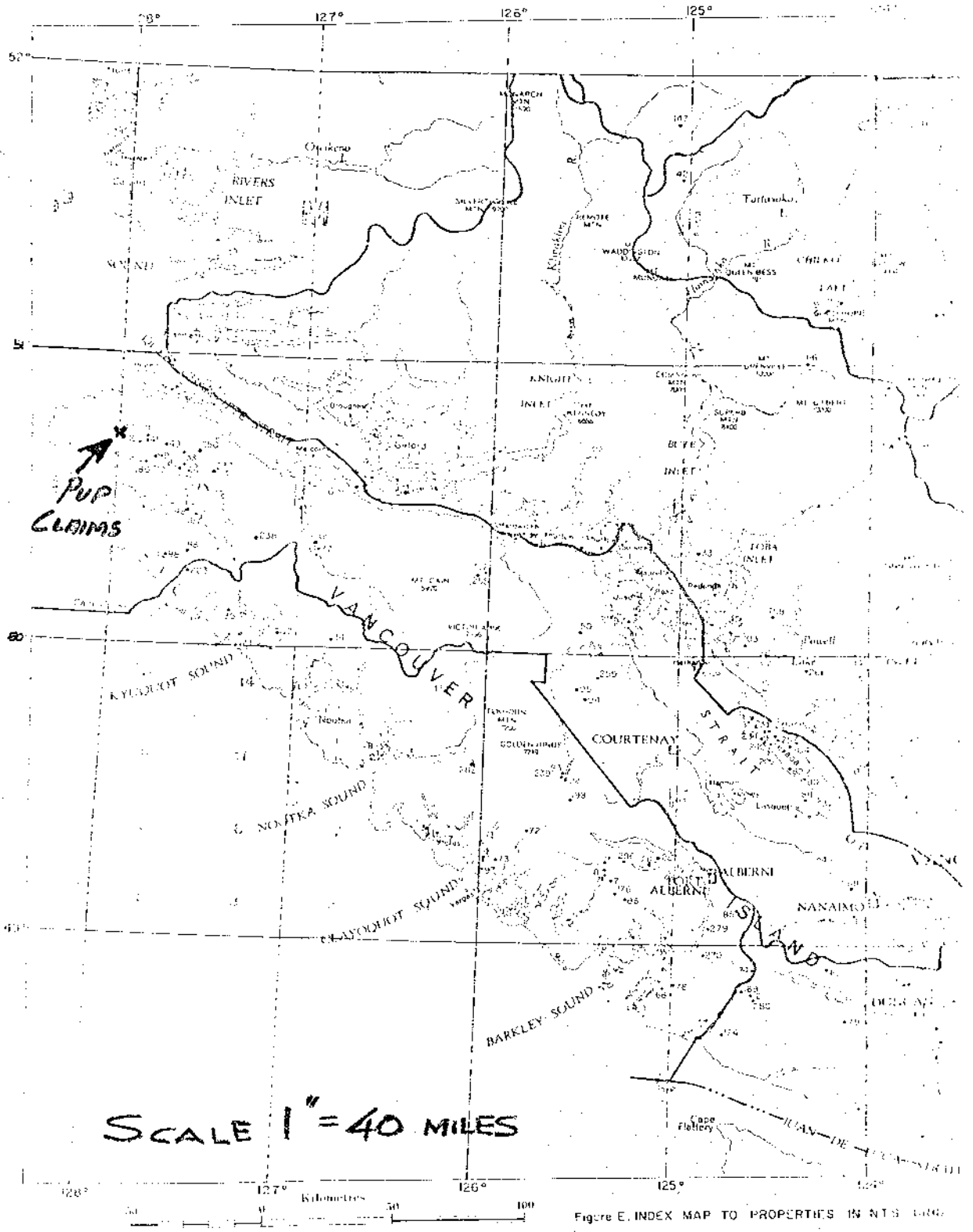


Figure E. INDEX MAP TO PROPERTIES IN NTS [illegible]

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 5383 MAP #1

5383
MAP 1

INTRODUCTION

The Pup I Claim Group is located in Northern Vancouver Island in the Province of British Columbia. The property consists of 23 mineral claims owned by Cities Service Minerals Corporation, and is currently being investigated for the possibility of a porphyry copper deposit. During the period June 21 to 27, 1974, a total of 3.7 line miles of induced polarization/resistivity surveying was completed over the property. The following reports describes the instrumentation, field procedure and results obtained from the survey.

The work was executed by Morrison and De Paoli I.P. Surveys upon the request of Cities Service Minerals Corp. and under the supervision of J. W. Murton.

LOCATION & ACCESS

The property is located on Northern Vancouver Island 6 air miles N of Holberg. (See Location Map, Figure 1) It lies within the Nanaimo Mining Division at 50°44' N. Lat., 128°00' W. Long. within NTS Block 92L 12 West. Access is available by vehicle along private logging roads. As logging operations are active in this area, permission should be obtained from Rayonier Canada Ltd. before travelling on these roads.

GRID CONTROL

The control grid consists of 4.2 miles of cut, chained and flagged lines. The central baseline is 2000 feet long and strikes at azimuth 315°. The five perpendicular cross lines were cut at 500 foot intervals. Emplacement of the lines was done by Brunton Compass.

GENERAL GEOLOGY

The Pup I Claim Group area exposes a partial section through the Bonanza Volcanic Pile. The majority of the property consists of a massive agglomerate unit trending 120° which displays increased silicification to the south. A parallel quartz breccia unit crosscuts the middle of the property and continues northward. The western portion of the property is underlain by a series of porphyritic dacite and andesitic flows.

INDUCED POLARIZATION SURVEY

1) Introduction & Theory

Because of limited outcrop exposure induced polarization measurements were undertaken to determine the lateral and vertical distribution of sulphides within 500 feet of ground surface over the grid area. Apparent resistivity data taken concurrently is useful in inferring overburden depths, defining abrupt lithological changes and assessing the importance of any I.P. effects obtained.

The term induced polarization means the electrical separation (i.e. separation of charges) induced by an applied electric field. The cause of this polarization is changes in the mobilities of ions within a rock. At the interfaces between zones of different mobilities, excesses or deficiences of ions occur; the concentration gradients developed oppose the current flow and cause a polarizing effect. When mineral grains block the pore passages of rocks and a current is applied, a concentration of ions builds up at the electrolyte (water - metal interface while awaiting an electrochemical reaction which must occur before the electric charge can be transferred from an ion in the electrolyte to a free electron in the metal. The forces which oppose the current flow are said to polarize the interface and the added voltage necessary to drive the current across

this barrier is known as "overvoltage".

2) Instrument & Procedure

A multiple frequency McPhar induced polarization system Model P660, was employed in measuring the polarization and resistivity parameters. The transmitter is a manually variable voltage source. The output current can be selected from both polarities and varies from direct current to automatically alternating output frequencies of 0.05, 0.1, 0.3, 1.25 and 5.0 hertz.

On this survey, the low and high frequencies employed were 0.3 and 5.0 hertz. Power was obtained from a 2½ KW-400 hertz motor generator. The maximum output current for the transmitting system is 5 amp. while the maximum output voltage is 690 volts.

The receiver employed was the A.C. P660 model. This is a potentiometer type where the amplified and filtered signal is compared with a reference voltage. It is powered by six 8V alkaline transitor batteries and raws 7.5 ma. Total weight including carrying case and batteries is 5 pounds.

An in line dipole-dipole array was employed in the survey. The dipole length was 200 feet and measurements were taken to 4 separations (N=1, 2, 3, 4). Survey procedure required the preparation of a "set-up" station near the center of each line. The transmitter and its motor generator power supply remained stationary at the set-up position and wires in increasing 200 foot intervals were strung out in both directions. Care was taken to ensure that the wires were separated to prvent inductive coupling effects. The ends of the wires were connected to 4 foot stainless steel rods which had hammered into the ground. Where possible the receiving dipole also utilized the stainless steel rods for electrode connections.

Once the receiver dipole moved past the last steel rod ground connections were made via porous pots. Radio contact between the receiver and transmitter operators coordinated power "on" and "off" periods.

3) Presentation of Data

The data is plotted in five pseudosections, Figures 3(a)-(e) after page 10. The pseudosections are vertical profile plots displaying apparent resistivities in ρ a/2 ohm-feet, calculated metal factors and percent frequency effect values. Contoured plan maps of the second separation (N=2), apparent resistivity and percent frequency effect data have also been prepared in Figures 4 and 5 respectively. An interpretation of the data is presented in Figure 6.

RESULTS & INTERPRETATION

An induced polarization anomaly was obtained in the northeastern portion of the grid area. The anomaly is open on both ends and is most intense on line 70+00E. The general trend of the anomaly is at azimuth 130°. It is associated with intermediate to low apparent resistivity values ranging from 200 to 75 ρ a/2 ohm-feet. Rock exposed in a small quarry at the end of the logging road near 75+00E; 115+00N is well mineralized with pyrite. Percent frequency effect values within the anomaly are interpreted to reflect 1.5 - 3.0% total sulphides by volume and the boundaries of the anomaly are marked in Figure 6.

A pronounced resistivity low occurs at coordinates 80+00E, 100+00 N on the baseline. This low is not accompanied by an increase in frequency effect values. Increased fracturing and/or a lithological change may be the cause of this low.

1.0% - 2.0% total sulphides by volume are interpreted to be the source of the anomaly.

A resistivity low parallels line 170 + 00N in the southwestern portion of the grid. Possible faulting has been indicated in this area, however, the low may also be indicative of a lithological change.

CONCLUSIONS

The main anomaly is attributed to fine grained pyrite within a tongue of Karmutzen volcanics. Faulting may have been a factor in the emplacement of the volcanics and the pronounced resistivity low would indicate increased facturing. The interpreted fault is shown because of the correlation of the resistivity low, polarizable high and coincidence of local stream drainage.

The northwestern anomaly, although indicative of lower sulphides is of some interest because of the suggested zonation pattern. The immediate source of the anomaly would also appear to be pyrite, however, overburden cover is heavy in this area.

RECOMMENDATIONS

Results of a previous geochemical soil sampling survey should be reviewed. Any correlation of anomalous copper values with induced polarization anomalies would warrant detailed and intensive prospecting of both I.P. anomalies. Attention should be focused specifically on the northwestern anomaly for the possibility of mineral zoning.

Without further geological or geochemical support drill testing of the induced polarization anomalies obtained is not recommended.

Respectfully Submitted:

Garry De Paoli

G. M. De Paoli
Geophysicist, B.Sc.

July 8, 1974
Vancouver, B.C.

C E R T I F I C A T I O N

I, GARRY M. DEPAOLI, of the City of Burnaby, in the Province of British Columbia, hereby certify as follows:

1. That I am a graduate of the University of British Columbia, Vancouver, British Columbia with a Bachelor of Science Degree in combined honours, Geophysics and Geology (1969).
2. That I have practiced my profession as a Geophysicist continuously for the past 5 years in Northern Ontario, Quebec, Manitoba, Western U.S.A., Yukon Territoritoes and British Columbia.
3. That I am a member in good standing of the Society of Exploration Geophysicists, The Geological Association of Canada, The Canadian Institute of Mining and Metallurgy, and the B.C. Society of Exploration Geophysicists.
4. That I have no interest directly or indirectly in the Deer Claim Group nor do I expect to receive any.
5. That the information contained herein was compiled as a result of an Induced Polarization Survey conducted during the period May 30 to June 7, 1974.

Garry DePaoli

G. M. DePaoli
Geophysicist, B. Sc.

Holberg, B.C.
26 June 1974

C E R T I F I C A T I O N

I, DENNIS F. MORRISON, of the City of Gravenhurst, in the Province of Ontario, hereby certify as follows:

1. That I have First Year University credits at the University of Waterloo, Waterloo Ontario.
2. That I was employed as an electronic technician during 1962-1966 for the Bell Telephone Company of Canada in Toronto.
3. That I was employed by McPhar Geophysics as an Induced Polarization Operator and Crew Chief during the period 1967-1971.
4. That I have been self-employed as an independent Induced Polarization Contractor from 1971-1974.
5. That I have comprehensive induced polarization operating experience in Newfoundland, Nova Scotia, Quebec, Ontario, Manitoba, B.C., Yukon Territories and Northwest Territories and Panama.
6. That I have no interest directly or indirectly in the Deer Claim Group nor do I expect to receive any.

D. F. MORRISON

Holberg, B.C.
26 June 1974

CERTIFICATION

I, J. W. Murton, of North Vancouver, British Columbia, do hereby certify that:

I am a member of the Association of Professional Engineers of the Province of British Columbia, registered in 1972, No. 8324.

I am a graduate of the University of Manitoba with a B.Sc. in Geology.

I have been a practising Engineer and Geologist since 1960 in Manitoba, Saskatchewan, British Columbia, South Western U.S.A. and Alaska.

Vancouver, B.C.

July 4, 1974

J. W. Murton, P. Eng.

CLAIM LIST - JANUARY 1975

PUP # I GROUP

		Record #	Expiry Date	Grouping Date
Pup	25	36591	March 8/75	December 28/73
	26	92	" "	" "
	27	93	" "	" "
	28	94	" "	" "
	29	95	" 1976	" "
	30	96	" 1975	" "
	31	97	" 1977	" "
	32	98	" "	" "
	33	99	" 1976	" "
	34	36600	" "	" "
	36	02	" 1975	" "
	38	04	" "	" "
	65	31	" "	" "
	66	32	" "	" "
	67	33	" 1976	" "
	68	34	" "	" "
	69	35	" "	" "
	71	37	" "	" "
	73	39	" 1975	" "
	75	41	" "	" "
	85	51	" "	" "
	21			

Pup	1	FR	37631	June 25/75	_____
Pup	2	FR	37632	June 25/75	_____
	23				

STATEMENT OF EXPENDITURES INCURRED FOR ASSESSMENT PURPOSES ON THE PUP #1 GROUP OF MINERAL CLAIMS, NANAIMO M.D. - JUNE 8-29/74

Supervision	
G. Hawkins - Geologist, 21 days @ $43.20/day	$ 907.20
B. Day - Field Assistant, 4 days @$36.40/day	145.60
W. Murton - Office & Supervision 2 days @$73.80/day	147.60
Linecutting Contract - 4.2 miles @$282.35/line mile	1,185.87
I. P. Survey	
Morrison & DePaoli I.P. Surveys - 9 days	1,575.00
K. Ronneseth - Geophysical Assistant 9 days @$28.00/day	252.00
R. Yorke - Geophysical Assistant 9 days @$28.40/day	255.60
Camp Costs	
63 man days @$15.20/ man day	957.60
Transportation	
Vancouver to Holberg & Return	120.00
Truck Rentals: 2 trucks @$500/month ($1000 x 9/30)	300.00
1 truck @$380/month ($380 x 21/30)	266.00
Gas & Oil	67.00
Miscellaneous	480.00
Total	$6,659.47

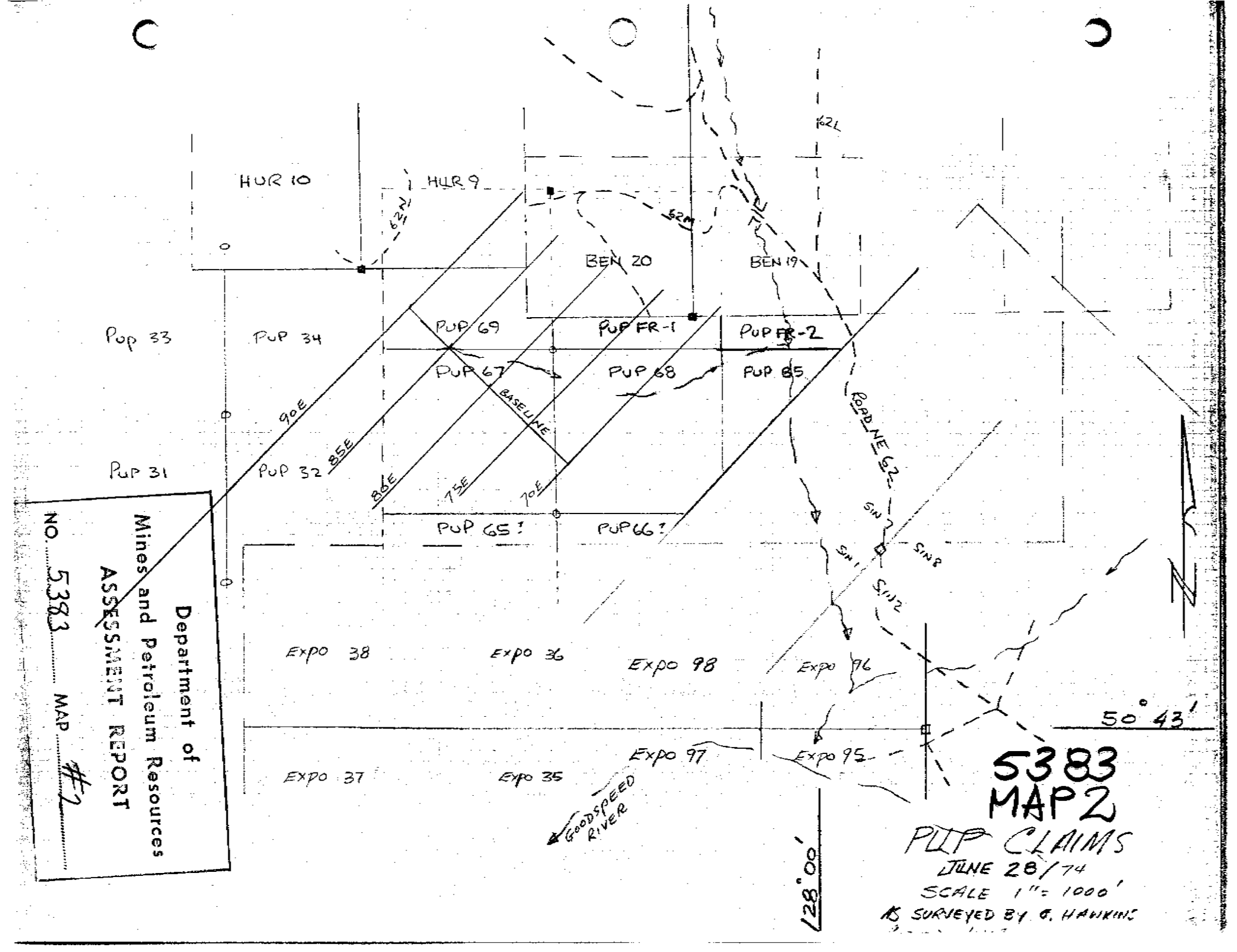
Declared before me in the _____

of _____, B.C., this _____

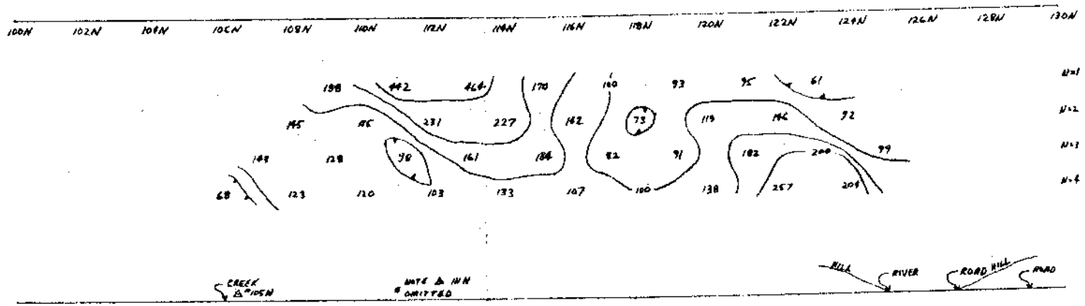
day of _____, 1975 A.D.

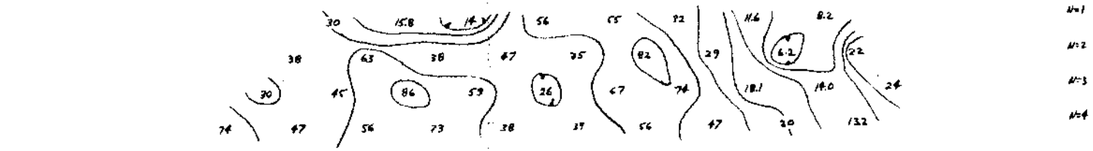
J. W. Murton, P. Eng.

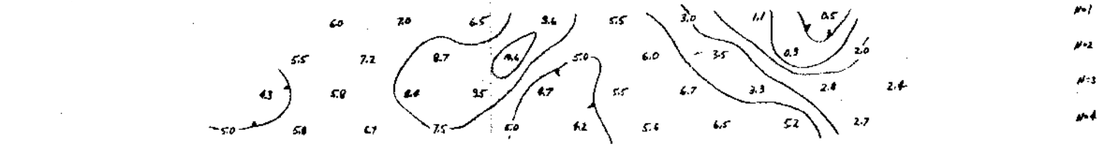
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J.W. MURTON ENGINEER


HUR 10
HLR 9
62N
62M
62L
BEN 20
BEN 19
PUP 33
PUP 34
PUP 69
PUP FR-1
PUP FR-2
PUP 67
PUP 68
PUP 65
BASE LINE
90E
85E
86E
7 5E
70E
PUP 31
PUP 32
PUP 65?
PUP 66?
ROAD NE 62
SIN
SIN R
SIN 2
Expo 38
Expo 36
Expo 98
Expo 96
Expo 97
Expo 95
Expo 37
Expo 35
GOODSPEED RIVER
50° 43'
128° 00'
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5383 MAP #2
5383
MAP 2
PUP CLAIMS
JUNE 28/74
SCALE 1" = 1000'
SURVEYED BY G. HAWKINS

LINE 70E





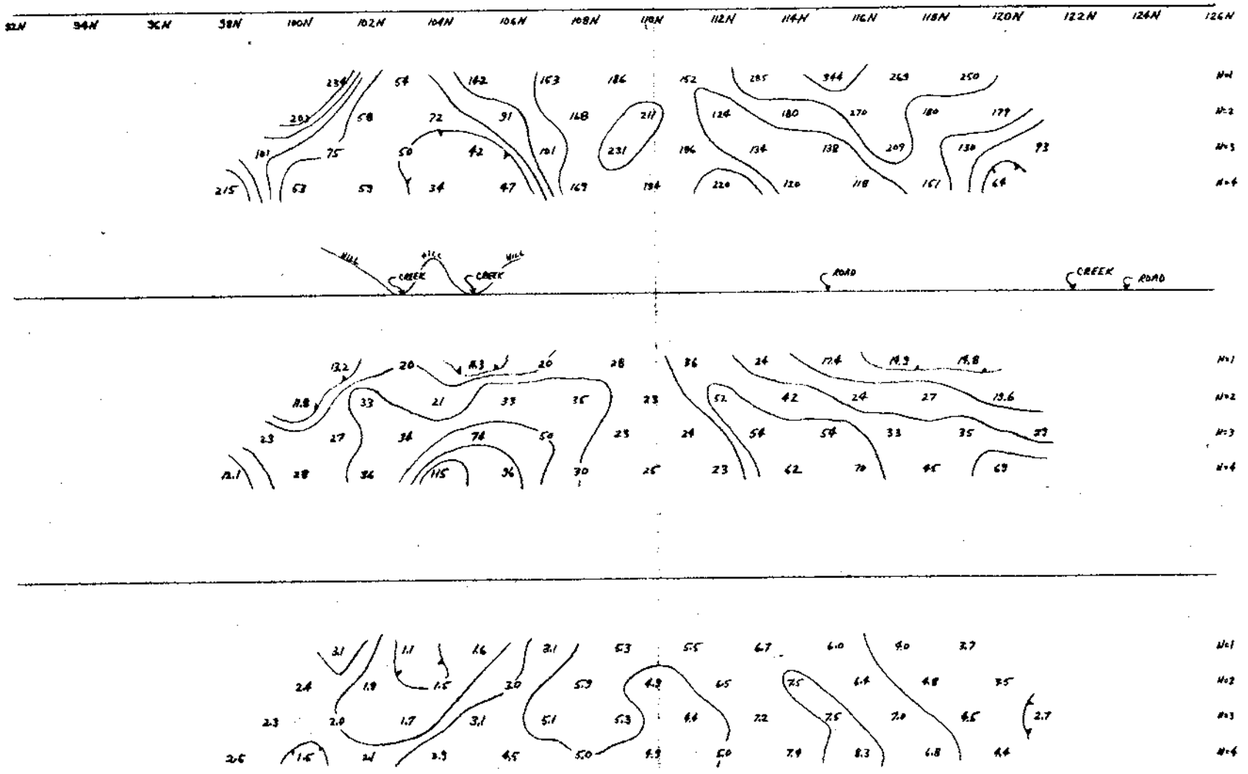


CITIES SERVICE MINERALS CORP.
NORTHERN VANCOUVER ISLAND, B.C.
PUP I CLAIM GROUP
HIGH POWER I.P.
DIPOLE - DIPOLE ARRAY
FREQ: 5.0 + 0.3 HZ
DATE: JUNE 25, 1974
OPERATORS: MORRISON + DEPAOLI

LINE 70E

FIGURE 3(a)

LINE 75 E



$f_{(a)}/2\pi$

M.F.

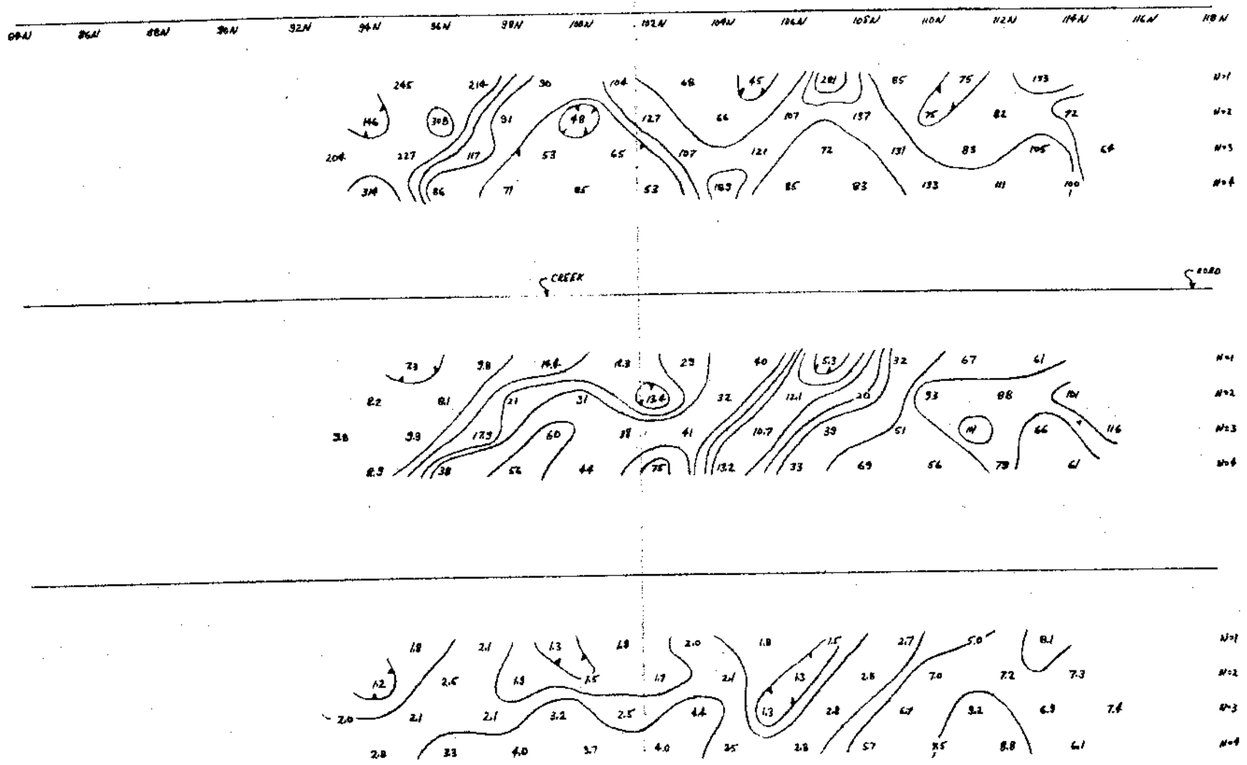
F.E.

CITIES SERVICE MINERALS CORP.
NORTHERN VANCOUVER ISLAND, B.C.
PUP I CLAIM GROUP
HIGH POWER I.P.
DIPOLE – DIPOLE ARRAY
FREQ: 5.0 ± 0.3 HZ
DATE: JUNE 25, 1974
OPERATORS: MORRISON & DEPAOLI

LINE 75 E

FIGURE 3(b)

LINE 80E



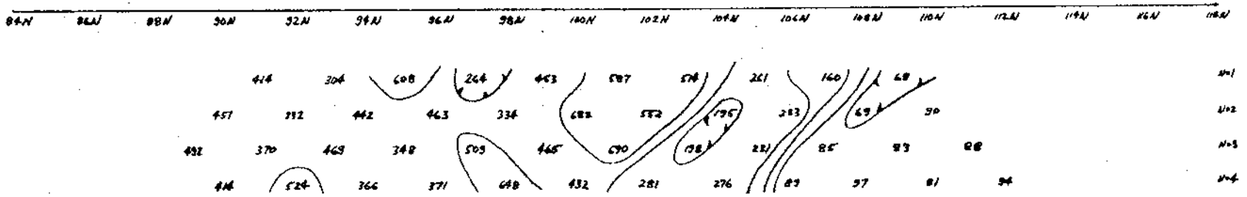
$\phi_{(a)}/2\pi$

CITIES SERVICE MINERALS CORP.
NORTHERN VANCOUVER ISLAND, B.C.
PUP I CLAIM GROUP
HIGH POWER I.P.
DIPOLE - DIPOLE ARRAY
FREQ: 5.0 + 0.3 HZ
DATE: JUNE 24, 1974
OPERATORS: MORRISON + DEPAOLI

LINE 80 E

FIGURE 3(c)

LINE 85 E

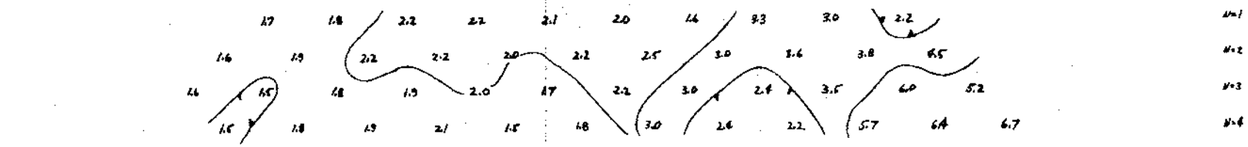


$f_{(\omega)}/2\pi$

CITIES SERVICE MINERALS CORP.
NORTHERN VANCOUVER ISLAND, B.C.
PUP I CLAIM GROUP
HIGH POWER I.P.
DIPOLE - DIPOLE ARRAY
FREQ: 5.0 ± 0.3 HZ.
DATE: JUNE 24, 1974
OPERATORS: MORRISON & DEPAOLI

M.F.

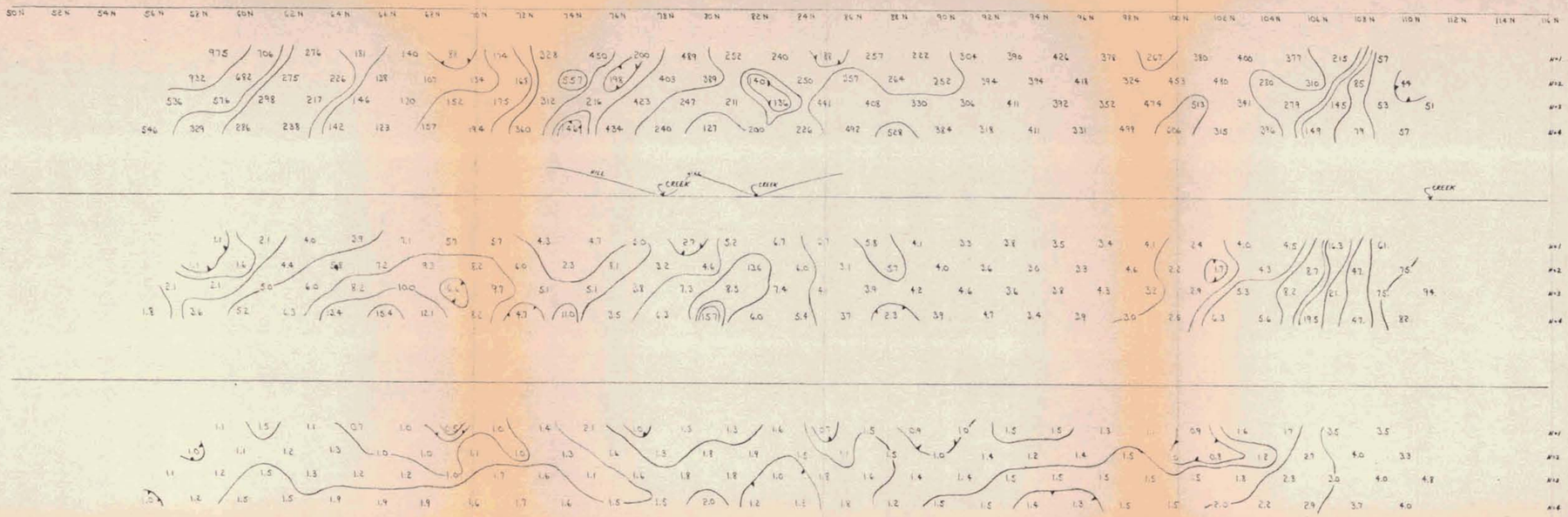
LINE 85 E



F.E.

FIGURE 3(d)

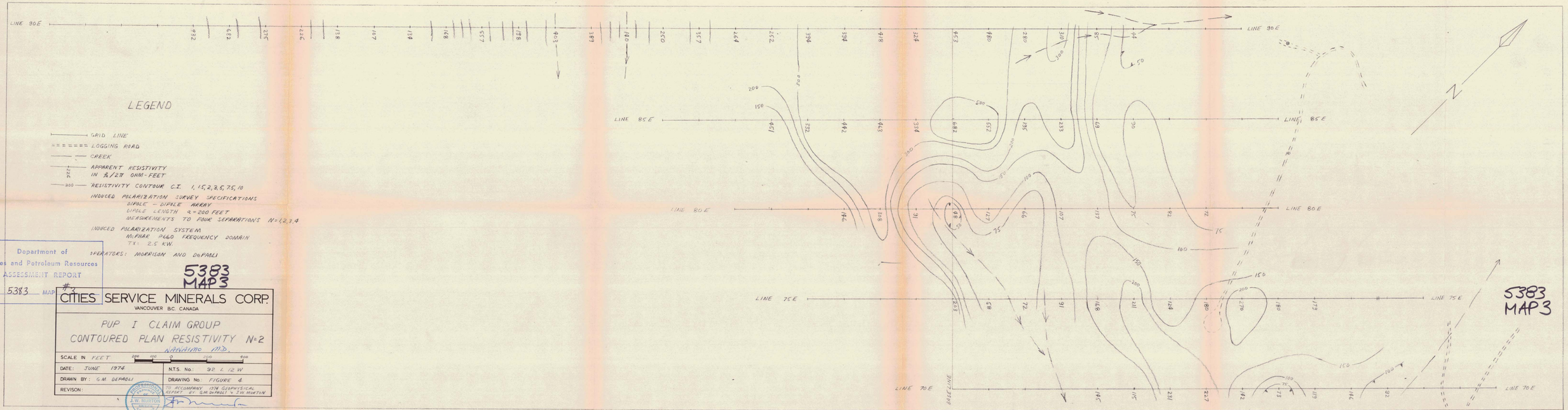
LINE 90E

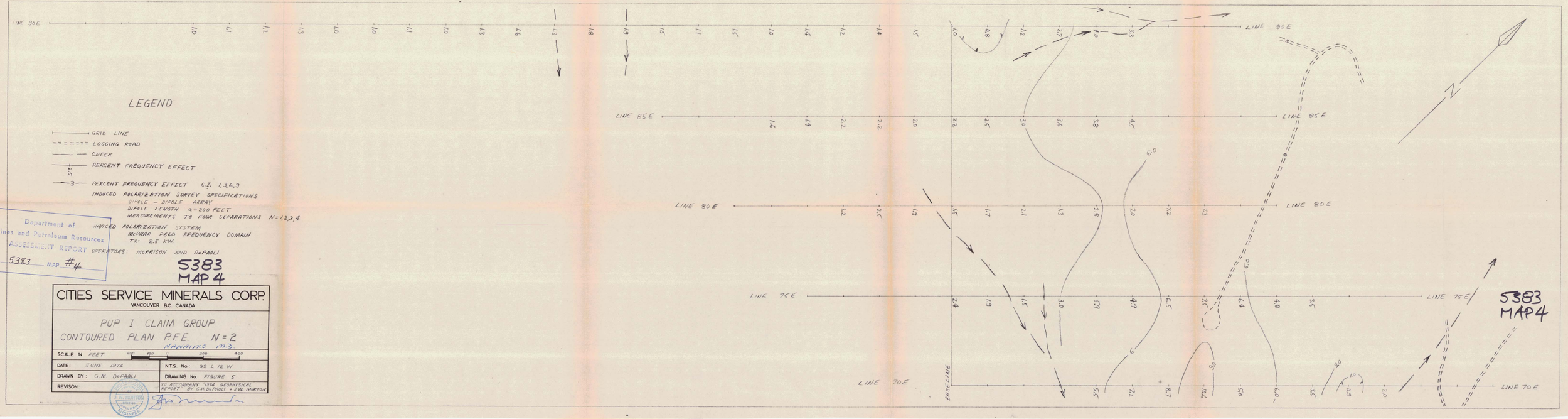


CITIES SERVICE MINERALS CORP.
NORTHERN VANCOUVER ISLAND, B.C.
PUP I CLAIM GROUP
HIGH POWER I.P.
DIPOLE – DIPOLE ARRAY
FREQ: 5.0 + 0.3 HZ.
DATE: JUNE 21, 23, 1974
OPERATORS: MORRISON + DEPAOLI

LINE 90E

FIGURE 3(e)


LINE 90E
LINE 85E
LINE 80E
LINE 75E
LINE 70E
LINE 90E
LINE 85E
LINE 80E
LINE 75E
LINE 70E
BASE LINE
LEGEND
GRID LINE
LOGGING ROAD
CREEK
APPARENT RESISTIVITY IN ρ/2π OHM-FEET
RESISTIVITY CONTOUR C.I. 1, 15, 2, 3, 5, 7.5, 10
INDUCED POLARIZATION SURVEY SPECIFICATIONS
DIPOLE - DIPOLE ARRAY
DIPOLE LENGTH a = 200 FEET
MEASUREMENTS TO FOUR SEPARATIONS N = 1, 2, 3, 4
INDUCED POLARIZATION SYSTEM
McPHAR P660 FREQUENCY DOMAIN
TX: 2.5 K.W.
OPERATORS: MORRISON AND DEPAOLI
CITIES SERVICE MINERALS CORP.
VANCOUVER B.C. CANADA
PUP I CLAIM GROUP
CONTOURED PLAN RESISTIVITY N=2
NANAIMO M.D.
SCALE IN FEET 200 100 0 200 400
DATE: JUNE 1974
N.T.S. No.: 92 L 12 W
DRAWN BY: G.M. DEPAOLI
DRAWING No.: FIGURE 4
REVISON:
TO ACCOMPANY 1974 GEOPHYSICAL REPORT BY G.M. DEPAOLI & J.W. MORTON
J.W. MORTON
Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5383 MAP #3
5383
MAP3
5383
MAP3



LEGEND

- GRID LINE
- LOGGING ROAD
- CREEK
- PERCENT FREQUENCY EFFECT
- PERCENT FREQUENCY EFFECT C.I. 1,3,6,9

INDUCED POLARIZATION SURVEY SPECIFICATIONS
DIPOLE – DIPOLE ARRAY
DIPOLE LENGTH a=200 FEET
MEASUREMENTS TO FOUR SEPARATIONS N=1,2,3,4

INDUCED POLARIZATION SYSTEM
McPHAR P61D FREQUENCY DOMAIN
TX: 2.5 KW.

OPERATORS: MORRISON AND DePAOLI

5383
MAP 4

CITIES SERVICE MINERALS CORP.

VANCOUVER B.C. CANADA

PUP I CLAIM GROUP
CONTOURED PLAN P.F.E. N=2

NANAIMO MIN. D.

SCALE IN FEET 200 100 0 200 400

DATE: JUNE 1974	N.T.S. No.: 92 L 12 W
DRAWN BY: G.M. DePAOLI	DRAWING No.: FIGURE 5
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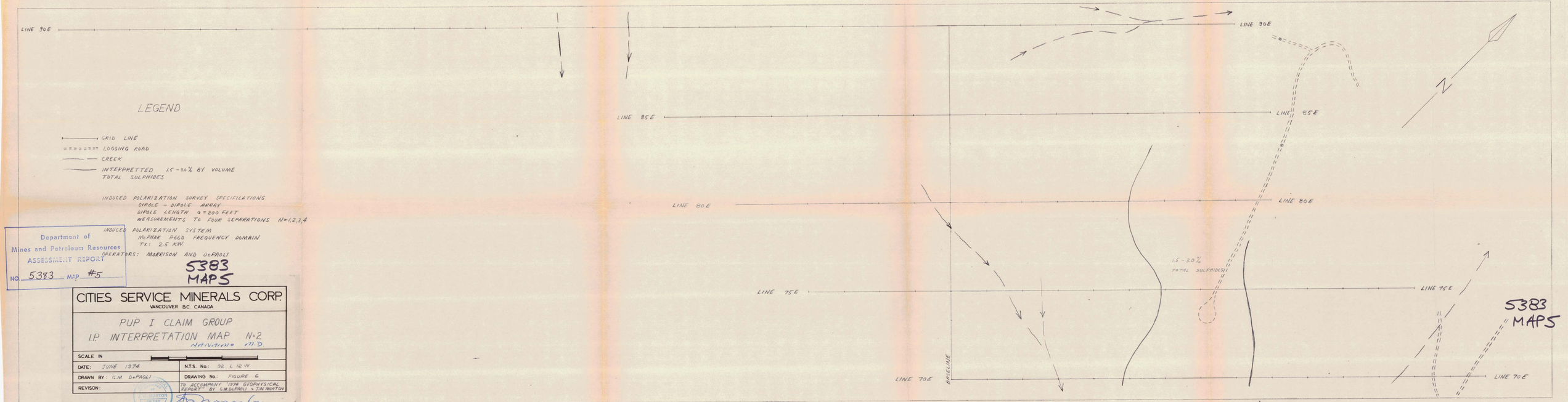
5383
MAP 4



LEGEND

- GRID LINE
- LOGGING ROAD
- CREEK
- INTERPRETTED 1.5 - 3.0 % BY VOLUME TOTAL SULPHIDES

INDUCED POLARIZATION SURVEY SPECIFICATIONS
DIPOLE - DIPOLE ARRAY
DIPOLE LENGTH a = 200 FEET
MEASUREMENTS TO FOUR SEPARATIONS N=1,2,3,4

INDUCED POLARIZATION SYSTEM
McPHAR P660 FREQUENCY DOMAIN
TX: 2.5 KW

OPERATORS: MORRISON AND DePAOLI

5383
MAPS

CITIES SERVICE MINERALS CORP.
VANCOUVER B.C. CANADA

PUP I CLAIM GROUP
I.P. INTERPRETATION MAP N=2
NANAIMO M.D.

SCALE IN	
DATE: JUNE 1974	N.T.S. No.: 92 L 12 W
DRAWN BY: G.M. DePAOLI	DRAWING No.: FIGURE 6
REVISON:	TO ACCOMPANY "1974 GEOPHYSICAL REPORT" BY G.M. DePAOLI + J.W. MORTON

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MAPS