

5792
M3

SOVEREIGN METAL CORP. (N.P.L.)
 FORMERLY
EMPIRE METALS CORPORATION LTD. (N.P.L.)
GOLDEN GROUP
 LILLOOET M.D., B.C. 93 J 15/W

Scale 1" = 1000'

To accompany report by G. Shore & T.L. Sadlier - Brown

5792

#5792

Report on

SELF-POTENTIAL SURVEY

Golden Claim Group

50°55'N 122°40'W

Lillooet M.D., B.C. NTS 92J 15W

by

Deep Grid Analysis Ltd.

for

EMPIRE METALS CORPORATION

October 1975

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. **5792** MAP

Summary

A self-potential survey over a portion of the property has located a number of anomalous conditions, including one expression of considerable magnitude on a single line extension.

Completion of systematic self-potential survey of the entire property is recommended in order to resolve in detail the geometry and electrical characteristics of the single strong expression above mentioned, and to locate other anomalous conditions.

Follow-up examination of existing anomalies should be undertaken to determine if sulphides are present.

C O N T E N T S

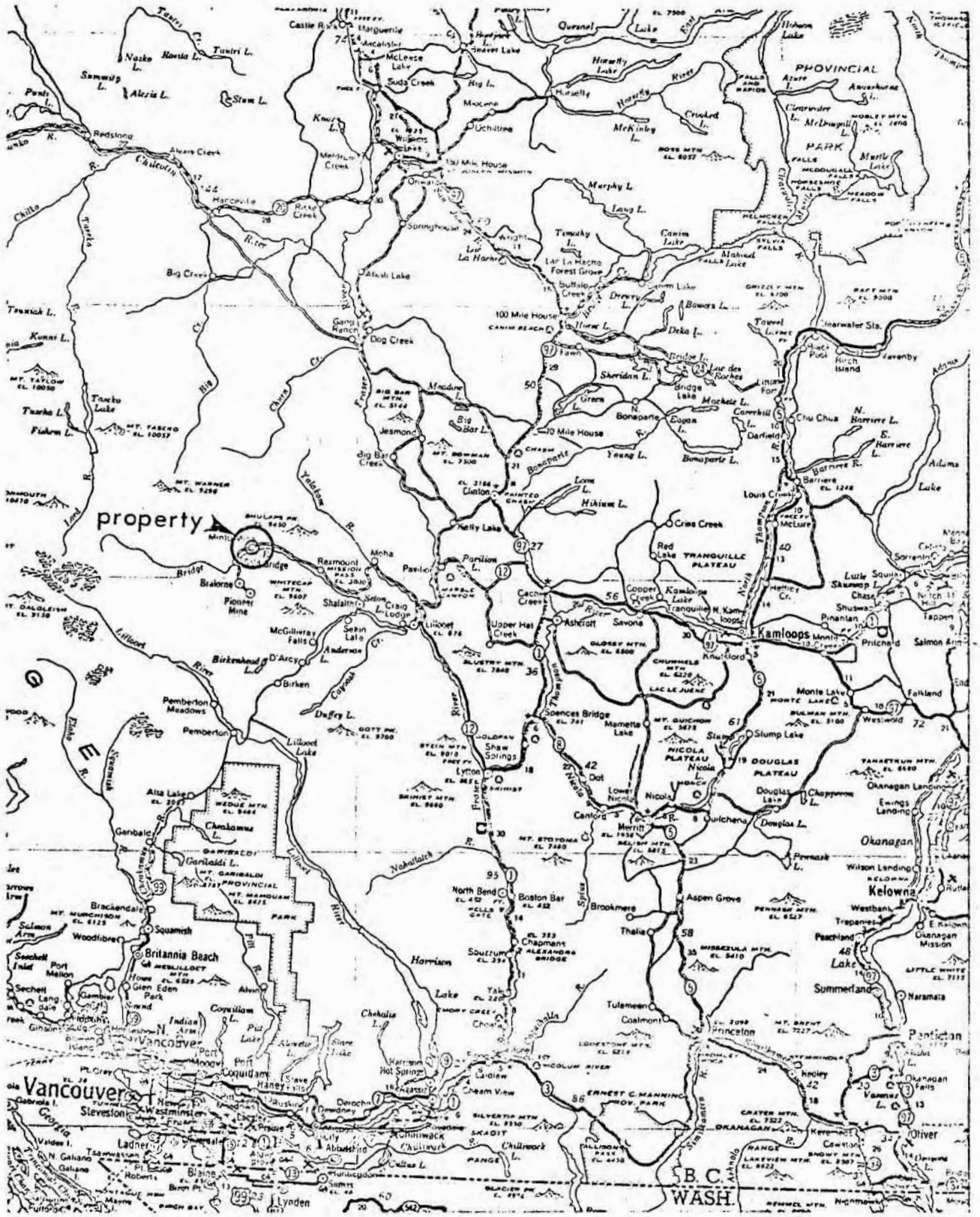
Summary	Page 1
Property location map, fig. 1	" 3
Introduction	" 4
List of Claims	" 4
Location, Access, Topography	" 4, 5
Survey Specifications	" 5
Data Discussion	" 5, 6
Conclusions and Recommendations	" 6

Drawings

fig. 2. Grid map showing data profiles.

Appendices

1. Manufacturer's specifications, survey instrument.
2. SP Data worksheets.



EMPIRE METALS CORP. LTD. (n.p.l.)

5792
M-1

location map
GOLDEN & MINTO properties

scale 1 in. = 31 miles

2972

Introduction

At the request of the company, G. Shore of Deep Grid Analysis Limited undertook on October 16 - 18, 1975 a reconnaissance self-potential (SP) survey of a portion of the Golden claim group, near Goldbridge, B.C.

This report will describe the survey operation and present an evaluation of the results.

List of Claims

The following claims are included in the "Golden" group:

Helm (Lot No. 6328)	Record No. 37048	Recorded Feb.18, 1974.
Golden 1 Fraction	" " 37049	" " 21, 1974.
Golden 2 Fraction	" " 37050	" " " "
Golden 3 Fraction	" " 37051	" " " "

Title to the above claims has been assigned to Empire Metals Corporation Ltd. (N.P.L.).

Location, Access, Topography

The claims are located on the north shore of Carpenter Lake in the Bridge River Valley of southwestern British Columbia at approximately 50°55'N, 122°40'W.

Access is by good gravel road from Lillooet, B.C., a distance of some 55 miles. This road passes through the south boundary of the group.

Topography/

Topography on the group is moderate to the north, with steep bluffs along the southern portion. Drainage is generally good.

Survey Specifications.

A total of 1.3 kilometres of survey line was examined, using a measurement interval of 20 feet on lines spaced 100 feet apart. A plan of the grid is shown in figure 2.

Measurements were made relative to a fixed base electrode at 1+20S/1+80E. The raw and datum-adjusted measurements are recorded on work sheets included in appendix 2.

Porous pot electrodes with CuSO_4 electrolyte were used; the measurement instrument was a Hewlett-Packard 970A digital voltmeter, with auto-ranging, auto-polarity direct readout, and 10 megohms input impedance. Full specifications recorded in appendix 1.

Data Discussion.

The SP approach is being applied as an indirect means of locating gold ore, of the type found and previously mined on the adjacent Minto property. The ore of the Minto vein is characterized by substantial amounts of sulphide mineralization in veins, stringers and replacements in the gangue (C. K. Ikona, P. Eng.- Geological and Geochemical Report on the Golden and Minto Claim Groups, January 1975; Mason and Dolmage, 1945). These massive sulphides may be expected to give rise to self-potential effects, particularly in the favourable groundwater and climatic conditions present on the properties.

Since/

Since the SP effect is being used strictly as a guide to potentially gold ore bearing structure, weak anomalies which would possibly not merit consideration in an economic sulphide exploration program must be examined carefully, particularly if directionally favourable trends can be discerned. The trend which crosses lines 2S, 3S, and 4S near baseline (figure 2) is an example which requires follow-up to determine if sulphide mineralization is present.

Anomaly "A" (figure 2) centered at 3+40E on the extension of line 0 is of a magnitude (48 millivolts peak/peak) consistent with responses observed previously by the operator over a known vein mineralization similar to that sought in the present survey. Little can be interpreted until further SP survey on the flanks of the anomaly delineates the full strike length and magnitude of the anomaly. That the anomaly expression occurs less than 1000 feet from the Minto vein to the east is of interest.

Conclusions and Recommendations

The results of this preliminary survey appear to confirm the usefulness of the method as a reconnaissance tool. It is recommended that the survey coverage be extended over the entire property for the purpose of:

- A. detailed delineation of anomaly expression "A",
- B. resolution of possible weak anomaly trends apparent at the edges of the present grid, and,
- C. location and resolution of other self-potential anomalies on ground not yet surveyed.

Limited/

Limited investigation of anomalies "A" and (trend)"B" as located on figure 2 to determine if sulphides are present could be undertaken before or during the additional SP survey work; potentially useful interpretive information may thus be gained at minimal cost. Detailed follow-up procedures should await a final interpretation of the data from the whole property.

Respectfully submitted,

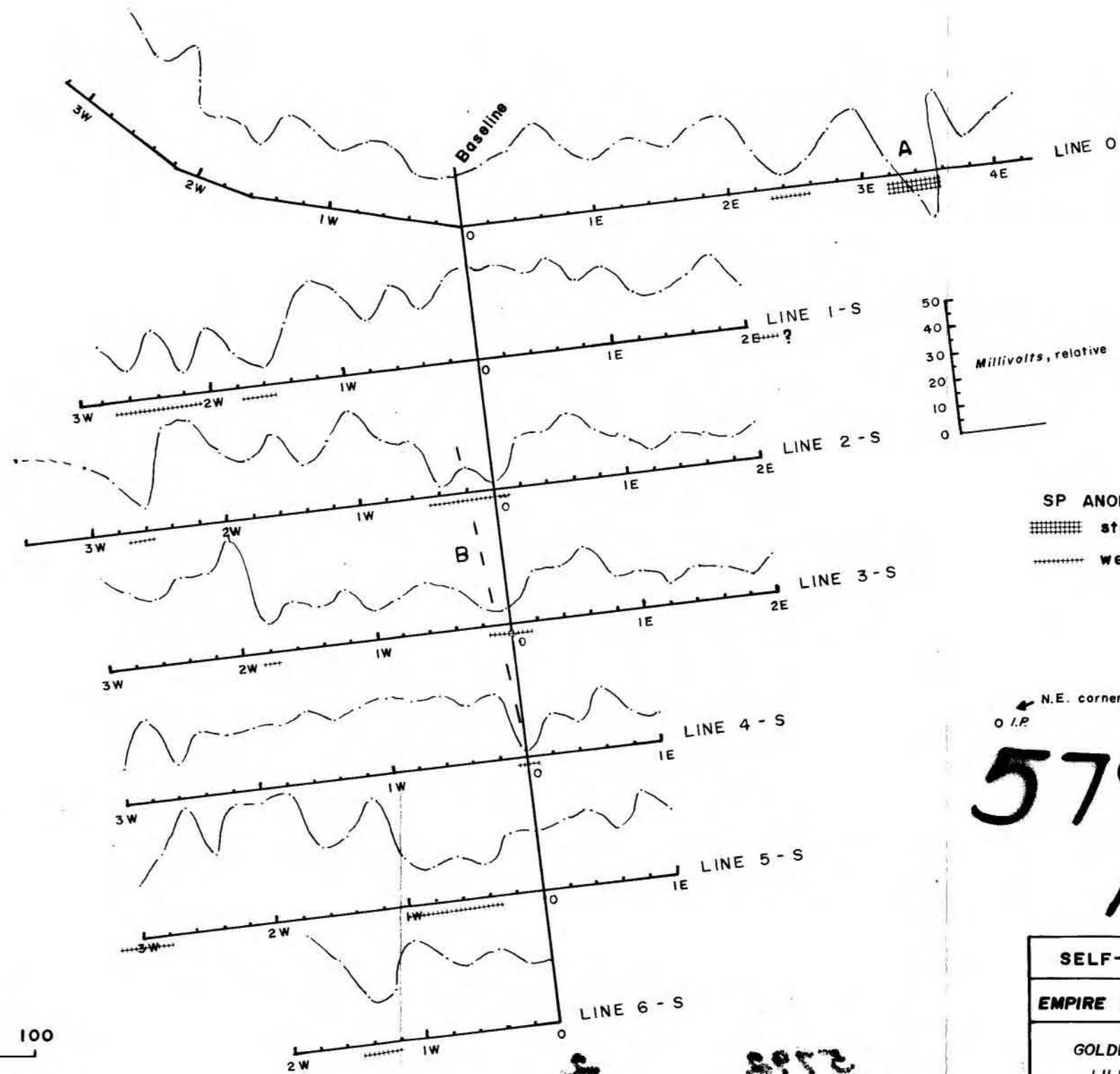
A handwritten signature in black ink, appearing to read 'G. A. Shore', written in a cursive style.

G. A. Shore
DEEP GRID ANALYSIS, LIMITED.

No 1 Post, Golden 2 B 3 Fr's.
 ← 280'



0 10 25 50 75 100
 HORIZONTAL SCALE - METRES



50
40
30
20
10
0
Millivolts, relative

SP ANOMALY
 ■■■■ strong
 weak

N.E. corner, Golden 1 Fr.
 O.I.P.
5792
M-2

2972

F. J. Halliburton

SELF-POTENTIAL (SP) SURVEY		
EMPIRE METALS CORP. LTD. (N.P.L.)		
GOLDEN	CLAIM	GROUP
LILLOOET M.D.	92 J - 15W	
by DEEP GRID ANALYSIS, LTD.		
Oct. 1975	Fig. 2	

HP 970A SPECIFICATIONS

TECHNICAL DATA 1 APR 74

DC VOLTMETER

Ranges: 0.1V, 1V, 10V, 100V, 1000V, (500V max input).

Accuracy (20°C to 30°C):
±(0.7% of reading + 0.2% of range).

Input resistance: 10 MΩ, ±5%.

Input protection: ≤750V peak.

Temperature coefficient: ±(0.05% of reading + 0.02% of range) / °C.

AC VOLTMETER

Ranges: 0.1V, 1V, 10V, 100V, 1000V (500V rms sine wave max input).

Accuracy (20°C to 30°C):

Ranges	45 Hz to 1 kHz	1 kHz to 3.5 kHz
1V to 1000V	±(2% of reading + 0.5% of range)	±(3% of reading + 0.5% of range)
0.1V (>3mV)	±(2% of reading + 0.5% of range)	±(5% of reading + 0.5% of range)

Input resistance: 10 MΩ, ±5%.

Input capacitance: <30 pF.

Input protection: ≤750V peak.

Temperature coefficient: ±(0.05% of reading + 0.05% of range) / °C.

OHMMETER

Ranges: 1kΩ, 10 kΩ, 100 kΩ, 1000 kΩ, 10,000 kΩ.

Accuracy (20°C to 30°C): ±(1.5% of reading + 0.2% of range).

Input voltage protection (resistor fused - clip mounted):
≤115V rms for up to 1 minute. ≤250V rms for up to 10 seconds.

Temperature coefficient: ±(0.05% of reading + 0.02% of range) / °C.

GENERAL

Ranging: automatic

Sample rate: 3/second.

Overrange: 10%

Calibration cycle: 1 year

Calibration adjustments: one

Operating environmental conditions:

Temperature range: 0°C to 40°C.

Humidity: ≤95% RH

Power: rechargeable batteries.

Typical operating time using fully charged battery: 2.5 hours continuous at 25°C.

Typical battery charging time: 14 hours at 25°C. (Indefinite charging will not damage battery.)

Weight (with Battery Pack)

Net: 7 oz. (200 g).

Shipping: 4 lb. (1,8 kg.)

Dimensions: 6½" long, 1¾" wide, 1¼" deep
(165 × 45 × 30mm)

PRICES: HP 970A (*DOMESTIC USA PRICES ONLY)

Quantity

1-9: \$310.00 EA.*

10-24: \$304.00 EA.*

25-99: \$295.00 EA.*

100 or more: contact your local HP Sales Office.

ACCESSORIES:

HP 97001A Extra Rechargeable Battery Pack

Price: \$26.00 EA.*

HP 97002A AC / DC Current Shunt / Bench Cradle

DC AMMETER

Ranges: .1 mA, 1 mA, 10 mA, .1A, 1A f.s.

Accuracy (20°C to 30°C):

±(2.5% of reading + 0.2% of range)

AC AMMETER

Ranges: .1 mA, 1 mA, 10 mA, .1A, 1A f.s.

Accuracy (20°C to 30°C, > 3% of range):

45 Hz to 1 kHz; ±(4% of reading + 0.5% of range)

1kHz to 3.5 kHz; ±(7% of reading + 0.5% of range)

DCV, ACV, OHMS: same as 970A specifications

GENERAL

Full Range Insertion Voltage: < 0.25V.

Input Protection: 2 Amp Fast Acting Fuse.

Weight:

Net: 6 oz. (170 g.)

Shipping: 4 lb. (1, 8 kg.)

Dimension: 3¾" long, 3¾" wide, 2" deep (95 × 95 × 51 mm)

Price HP 97002A: \$47.00 ea.*

Regional HP Sales Offices: East (201) 265-5000 • Midwest (312) 677-0400 • South (404) 436-6181 • West (213) 877-1282. Or, write: Hewlett-Packard, 1501 Page Mill Road, Palo Alto, California 94304. In Canada, 50 Galaxy Blvd., Unite No. 8, Rexdale, Ontario, Canada. In Europe, P.O. Box 85, CH-1217 Meyrin 2, Geneva, Switzerland. In Japan, YHP, 1-59-1, Yoyogi, Shibuya-Ku; Tokyo, 151.

line:
BASELINE

SELF-POTENTIAL (SP) SURVEY

1 of 9 shts.

DGA GEOPHYSICS / Deep Grid Analysis, Ltd.

base/roving pole moving dipole	dipole	orientations	instrument	operator	job	grid	data source	date	
			H-P970A	G.S.	0675	GOLDEN	NEWSURVEY-SA	Dec 2-1-75	
Base Co-ords	Sta.	Reading	Ref. Point	Millivolts	Ref. Point	Millivolts	Ref. Point	Millivolts	Topo. & Obs.
A.	0+00	-11	+30	19					
	20s	X	↓						NOT TAKEN G.S. ERROR
	40	-10		20					
	60	-11		19					
	80	-15		15					
	1+00s	+4+6+5		35					
	20	+1		31					
	40	-4		19					
	60	-8		22					
	80	-7		23					
	2+00s	-18-28-27		2					
	20	-18		12					
	40	-9		21					
	60	-13		17					
	80	-18		12					
	3+00s	-23-23-25		6					
	20	-15		15					
	40	-10		20					IN TRENCH
	60	-4		26					
	80	-8		22					
	4+00s	-27-27-30		2					
	20	-8		22					
	40	-6		24					
	60	-11		19					
	80	-8		22					
	5+00s	-8-8-7-9		22					
	20	-10		20					
	40	-20		10					
	60	-22		8					
	80	-14		16					
	6+00s	-6.		24.					

END.

line: 0+005

SELF-POTENTIAL (SP) SURVEY

2 of 9 shts.

DGA GEOPHYSICS / Deep Grid Analysis, Ltd.

base / roving pole	dipole	orientations	instrument	operator	job	grid	data source	date	
roving dipole			H-P 970A	G.S.	0675	GOLDEN	NEW SURVEY - SP	ECL 17-18/75	
Base Co-ords	Sta.	Reading	Ref. Point	Millivolts	Ref. Point	Millivolts	Ref. Point	Millivolts	Topo. & Obs.
A.									
	B.L.								
	20E	-8	+30	22					} ON BULLDOZED BENCH
	40	-4	↓	26					
	60	+5		35					
	80	-4		26					
	1+00E	-11		19					↓ UP SLOPE
	20	-6		24					
	40	-6		24					
	60	-10		20					
	80	-3		27					
	2+00E	-1		29					
	20	-15		15					
	40	-25		5					NO O/C
	60	-21		9					
	80	-10		20					
	3+00E	-4		26					
	20	-24		6					NO O/C AVAILABLE
	40	-39		-9					
	50	-43		-18					
	60	0		30					NOTE 3TSD DETAIL READING
	80	-18		12					
	4+00E	-11		19					
	20	-5		25					

line: 0+005
WEST ALONG ROAD.

SELF-POTENTIAL (SP) SURVEY

3 of 9 sheets.

DGA GEOPHYSICS / Deep Grid Analysis, Ltd.

base/roving pole roving dipole	dipole	orientations	instrument H-P970A	operator G.S.	job 0675	grid GOLDEN	data source NEW SURVEY - SP	date 09/17/97
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Base Co-ords	Sta.	Reading	Ref. Point	Millivolts	Ref. Point	Millivolts	Ref. Point	Millivolts	Topo. & Obs.
A.									
	0+005 B.L.	-15	+30	15					
	20	-13	↓	17					
	40	-13		17					
	60	-4		26					
	80	-4		26					
	1+00	-8		22					
	20	-2		28					
	40	+2		32					
	60	-10 -8		21					"SHOWING"
	80	-6		24					
	2+00	-6		24					
	20	-6		24					
	40	+1		31					
	60	+10		40					
	80	-2		28					
	3+00	+3		33					
	20	+6		36					
	40	+3		33					
	60	+2		32					
	80	+7		37					
	4+00	-7		23					

line:
1+005

SELF-POTENTIAL (SP) SURVEY

4 of 9 shts.

DGA GEOPHYSICS / Deep Grid Analysis, Ltd.

base/roving pole roving dipole	dipole L.	orientations	instrument H.P. 970A	operator G. S.	job 0675	grid GOLDEN	data source NEW SURVEY - SP	date 09/17-18/75	
Base Co-ords	Sta.	Reading	Ref. Point	Millivolts	Ref. Point	Millivolts	Ref. Point	Millivolts	Topo. & Obs.
A.	1+00E	-1	+30	29					
	80	-5	↓	25					
	60	+4		34					
	40	0		30					
	20E	+4		34					
	B.L.	+5+6		35					
	20W	0		30					
	40	-9		21					START UP SLOPE
	60	+1		31					UP
	80	-11		19					"
	100	+1		31					"
	20	6		36					"
	40	-8		22					"
	60	-24		6					"
	80	-17		13					" IN TRENCH
	2+00	-7		23					"
	20	-22		8					"
	40	-5		25					" TRENCHES ABOVE & BELOW
	60	-19		11					"
	2+80W	-9		21					
	3+00W 0+755	-16							ON SHOWING
	"	-16							2ND POSITION
	1+20E	-12		18					DISPLACED 20'S
	40	-13		17					
	60	-8		22					IN BANK, EDGE ROAD CUT
	80	-2		28					
	2+00E	-14		16					

line:
2+005

SELF-POTENTIAL (SP) SURVEY

5 of 9 shts.

DGA GEOPHYSICS / Deep Grid Analysis, Ltd.

base/roving pole roving dipole	dipole	orientations	instrument H.P.970A	operator G.S.	job 0675	grid GOLDEN	data source NEW SURVEY-SP	date OCT 17-18/75
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Base Co-ords	Sta.	Reading	Ref. Point	Millivolts	Ref. Point	Millivolts	Ref. Point	Millivolts	Topo. & Obs.
4.	2+00E	-16	+30	14					DOWN
	80	-21	↓	9					↓
	60	-18		12					↓
	40	-17		13					↓
	20	-22		8					UP
	1+00E	-16		14					↓
	80	-17		13					↓
	60	-5		25					↓
	40	-11		19					DOWN
	20E	-12		18					↓
	B.L.	-26-28		3					↓ LEVEL
	20W	-21		9					↓
	40	-27		3					UP SLOPE
	60	-8		22					↓
	80	-7		23					↓
	1+00W	+5		35					↓
	20	-5		25					↓
	40	-13		17					VERY STEEP
	60	0		30					↓
	80	-8		22					↓
	2+00W	-4		26					TOP OF SLOPE
	20	+9		39					↓
	40	+7		37					IN TRENCH - TR AT 90°
	60	-22		8					↓
	80	-11		19					↓
	3+00W	-4		26					↓
	3+50W	+2		32					IN ROAD.

line: 3+005

SELF-POTENTIAL (SP) SURVEY

6 of 9 shts.

DGA GEOPHYSICS / Deep Grid Analysis, Ltd.

base/roving pole roving dipole	dipole	orientations	instrument	operator	job	grid	data source	date	
			H.P. 970A	G. S.	0675	GOLDEN	NEW SURVEY - SP	09/17-18/75	
Base Co-ords	Sta.	Reading	Ref. Point	Millivolts	Ref. Point	Millivolts	Ref. Point	Millivolts	Topo. & Obs.
A.									
	1+00E	-17	+30	13					
	80	-8	↓	27					
	60	-1		29					
	40	-26		4					
	20E	-7		23					
	B.L.	-23		7					
	20W	-23		7					
	40	-14		16					
	60	-11		19					
	80	-16		14					
	1+00	-19		11					
	20	-10		20					BANK, EDGE OF ROAD
	40	-15		15					"
	60	-12		18					"
	80	-19		11					"
	2+00	+15		45					OFF ROAD - ON-LINE
	20	+2		32					BELOW O/C
	40	+2		32					
	60	-5		25					ROAD
	80	-2 ± 1		28					TRENCH TO NORTH
	3+00	+5		35					

line:
5+005

SELF-POTENTIAL (SP) SURVEY

8 of 9 shts.

DGA GEOPHYSICS / Deep Grid Analysis, Ltd.

base/roving pole roving dipole	dipole	orientations	instrument H-P 970A	operator G.S.	job 0675	grid GOLDEN	data source NEW SURVEY - SP	date OCT 17-18/75
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Base Co-ords	Sta.	Reading	Ref. Point	Millivolts	Ref. Point	Millivolts	Ref. Point	Millivolts	Topo. & Obs.
A.									
	1+00E	-5	+30	25					ROCK BLUFF - DOWN
	80	+3	↓	33					
	60	-10		20					
	40	-2		28					
	20E	-4		26					
	B.1.	-9 -8		22					
	20W	-8		22					
	40	-18		12					
	60	-14		16					TRENCH
	80	-16		14					
	1+00W	-12		18					
	20	+12		42					
	40	-1		29					
	60	-4		26					
	80	+17		47					
	2+00W	+15		45					
	20	+15		45					
	40	-2		28					
	60	+17		47					
	80	0		30					
	3+00W	-10		20					TRENCH

Certificate of Qualification

I, G. A. Shore, of 101-1139 Lonsdale Avenue, North Vancouver, B.C., hereby state that:

1. I am a graduate at technologist level of Radio College of Canada, Toronto, Ontario, in General Electronics, of the RCA Institute, Montreal, Quebec, in Automation Electronics and Industrial Electronics, and of the Provincial Institute of Automotive and Allied Trades, Toronto, Ontario, in Industrial Engines and Power Transmission Systems.

2. I have been employed in geophysical exploration survey work as senior operator and/or project geophysical manager on varied programs in Europe, Africa and North America for the past ten years, and have been directly involved in design, development and field testing of various geophysical instrumentation systems during this period.



G. A. Shore

February 2, 1976.

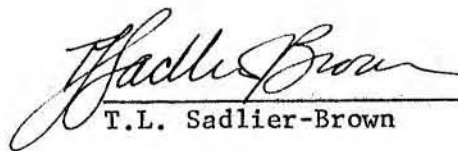
QUALIFICATION OF SUPERVISOR

I, T.L. Sadlier-Brown of 1102 - 1307 Harwood Street,
Vancouver, B.C. hereby declare that:

I was educated in geology at Carleton University,
Ottawa, Ontario.

I am a partner in the firm of Nevin Sadlier-Brown
Goodbrand Ltd., Consulting Geologists, with offices
at 134 Abbott Street, 5th Floor, Vancouver, B.C.

I have been active as an exploration geologist full
time since 1964 and have directed exploration projects
throughout Western Canada as well as in the United
States and Maritime Provinces.


T.L. Sadlier-Brown

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
To Wit:

In the Matter of

A GEOPHYSICAL SURVEY CONDUCTED BETWEEN OCTOBER 16TH, AND 18TH, 1976 ON MINERAL CLAIMS NO. 37048 TO 37051 INCLUSIVE LOGATED IN THE LILLOOET MINING DIVISION.

I. HAROLD S. AIKINS

of 376 East 4th Street, North Vancouver, B.C.

in the Province of British Columbia, do solemnly declare that

Personnel employed and costs incurred in a Geophysical Survey and prospecting on the Helm and Golden claims, Lillooet, M.D. were as follows:-

Deep Grid Analysis Ltd.	
G.A. Shore, Geophysical Technician	
- Oct. 16-18; 3 field/days @ \$100/Day	\$300.
- Report preparation, equipment & rental disbursements	<u>80.</u>
	\$ 380.00
T.L. Sadlier-Brown, Geologist	
- Oct. 16-18; 3 days - nominal fee	1.00
H.S. Aikins, Sr. Technician, C.E.T.	
- Oct 16-19; field, travel, drafting and data reduction applicable portion of salary	400.00
Meals & Accommodation	254.72
Travel & Ground Transportation	<u>130.67</u>
	<u>TOTAL</u>
	<u>\$1,166.39</u>

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City
of Vancouver, in the
Province of British Columbia, this 20
day of February 1976, A.D.

H.S. Aikins

John J. J. J.
A Commissioner for taking Affidavits for British Columbia or
A Notary Public in and for the Province of British Columbia.

Sub - mining Records