

GEOPHYSICAL and GEOCHEMICAL ASSESSMENT REPORT

on the
STEM NØ1 to NØ12 CLAIMS
(Pipe Group)

Situated 20 air kilometres Northeast of the town of Hope, B.C.

New Westminster M.D.

92H/11W

N.T.S. 92 H/11 W.

STEM

Latitude 49° 32' N. Longitude 121° 18' W.

on behalf of

Longbar Minerals Limited

Field Work between August 23, and September 24, 1975.

5907

by:

D. R. Cochrane, P. Eng.,
July 9, 1976.
Delta, British Columbia.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 5907 MAP



Cochrane Consultants Limited
4882 Delta St., Delta, B.C. V4K 2T8 946-9221
Geotechnical Consulting / Exploration Services

geology
geophysics
geochemistry

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PREFACE:

Late in the summer of 1975, a field crew under the direction of Jon Stewart and Dr. W. K. Geiger completed VLF-EM, Ground Magnetometer and Geochemical Soil Sampling Surveys on the Stem Claims, located in the Coquihalla Gold Belt of southern British Columbia.

This report describes the work done, the procedures used and the results obtained. Metric units have been used exclusively in this report, and, in order to avoid possible confusion, a conversion table is appended.



PART A: SUMMARY AND CONCLUSIONS

1. Longbar Minerals Ltd. of Edmonton Alberta, hold title to twelve (12) Stem claims situated in the Coquihalla Gold Belt of southern British Columbia.

2. The claims are accessible only by pack trail or helicopter and are centered 20 air kilometers northeast of Hope.

3. During the late summer of 1975, a field crew completed a ground control (flag) grid on the Stem #1 to #8 claims, and conducted coincident VLF-EM, magnetometer and geochemical soil sampling surveys.

4. The magnetometer survey shows the area is characterized by gentle magnetic relief with northwesterly isomagnetic trends. Presumably this suggests a uniform and relatively homogeneous subsurface lithology with a northwest strike trend.

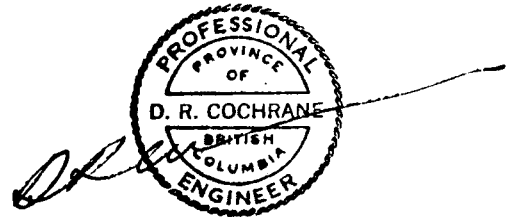
5. The VLF-EM survey showed a considerable change in subsurface conductivity. First derivative analysis indicated that many of the conductors are parallel with the geophysically indicated rock strike trend and therefore may be lithologic in nature (i.e. pyritic or graphitic horizons). A cross trend conductor feature may be due to faulting.

6. Four (4) upper B horizon soil samples contained gold in excess of 0.04 p.p.m. and two of these lie along an EM feature on which there is an old adit.



7. Investigation as to the cause of the anomalous geophysical and geochemical features is recommended.

Respectfully submitted,



D. R. Cochrane, P.Eng.,
July 9, 1976,
Delta, B.C.



PART B: SETTING

B-1 Location and Access

Land access to the Stem claims is restricted to pack trails and two such trails are available:

- (a) northerly from Carolin Mines Idaho Zone roads along the Pipestem trail for a distance of about four kilometers, or
- (b) easterly around the southern point of Spider Peak from the top part of the Hillsbar (Qualark Creek) logging roads, a distance of approximately 3 kilometers (but much steeper and no distinct trail).

The most facile access is by helicopter and a charter service is available from Hope. The air distance to the claims is 20 kilometers. The NTS code for the area is 92H/11W; the latitude is 49°32'N, and longitude 121°18'W. (see location map)

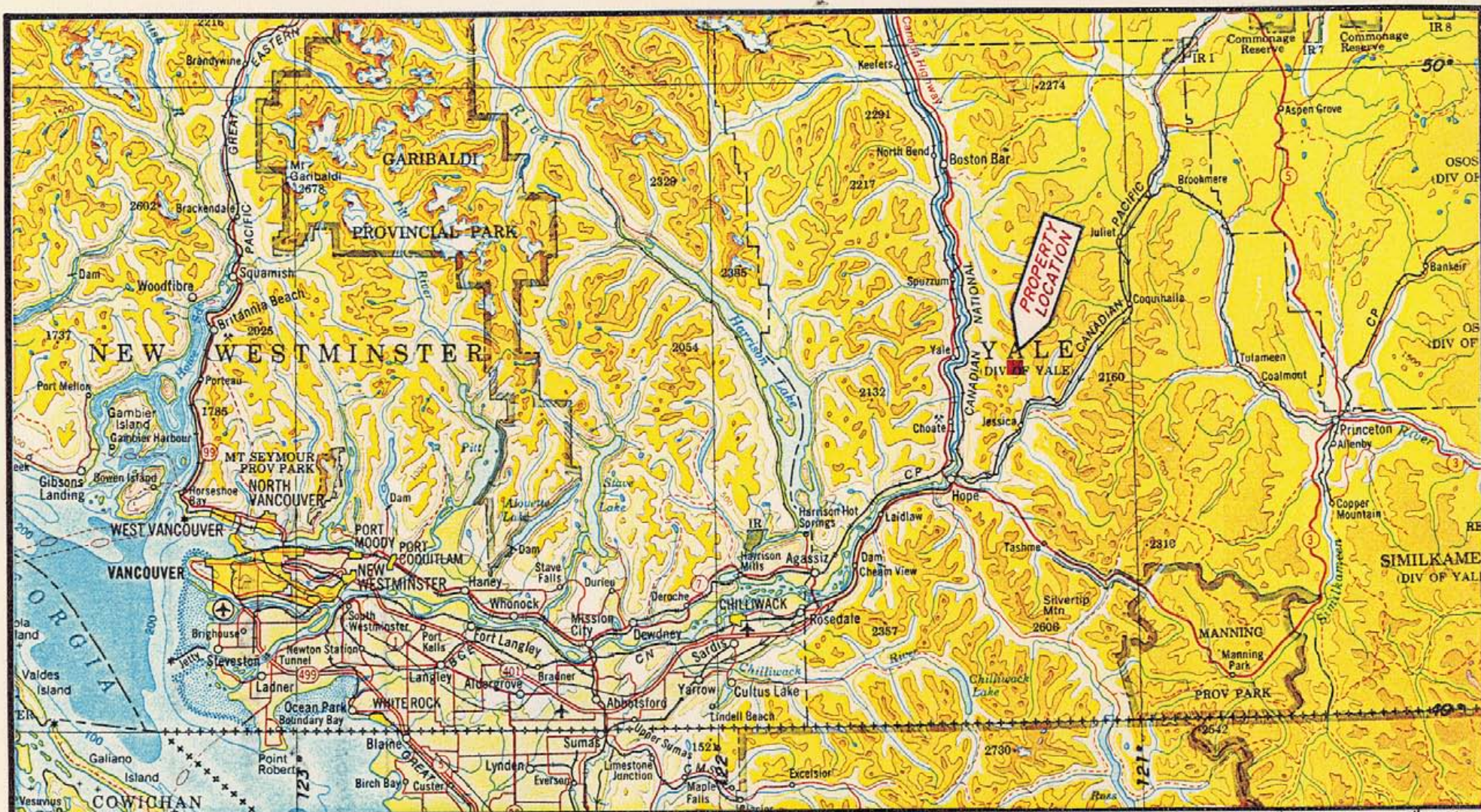
B-2 Claims and Ownership

The Stem #1 to #12 claims are owned by Longbar Minerals Ltd. of 100-10975 124th Street, Edmonton, Alberta. Their free Miners License is 151356, issued January 6, 1976.

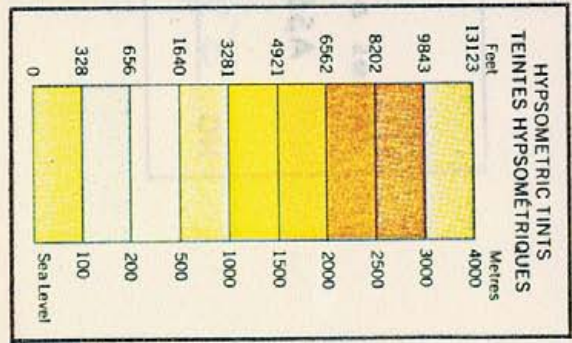
The following table lists pertinent claims information:

<u>Claim Name</u>	<u>Record No.</u>	<u>Expiry Date before A.W. Filing</u>	<u>Expiry Date applied for</u>
Stem #1 to #5 (incl.)	29356-60	July 2, 1976	July 2, 1979
Stem #6 to #12 (incl.)	29361-67	July 2, 1976	July 2, 1978





Above map is from Dept. of Energy, Mines & Resources "Vancouver NM 9/10," 1969.

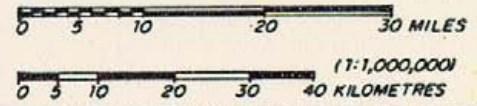


LONGBAR MINERALS LIMITED

STEM CLAIMS PROJECT
COQUIHALLA GOLD BELT AREA
NEW WESTMINSTER MINING DIVISION, B. C.

LOCATION MAP

Figure 1



1" = 15.75 MILES
DWN: B.A.C., MAR/75
Cochrane Consultants Limited
4682 Delta Street — Delta B.C.

The Stem claims form a contiguous block, two (2) old claims wide (3000 feet) by six (6) old claims long (9000 feet). The location line runs north-northwesterly. (see claims Map)

They are recorded in the New Westminster Mining Division and their approximate location is shown on B.C. Department of Mines Mineral Claims Map #92H/11 (west $\frac{1}{2}$).

B-3 General Setting

The Stem claims lie along the Coquihalla Gold Belt, an unusual north-northwest metalogenic zone situated in the north Cascade Mountain Range. The country is an impressive portion of British Columbia, characterized by high mountain peaks, deeply incised stream valleys and a luxurious sub-coastal forest cover.

The claims lie along an unnamed ridge immediately east of and parallel to the Spider Peak Ridge. Elevations vary from just over 1300 meters at the south end of the property to approximately 800 meters above sea level at the north end of the property. The area is drained by the south fork of Siwash Creek, a tributary of the Fraser River.

The Stem claims lie east of the Coquihalla Serpentine Band, and entirely within the Jurassic Ladner Slate sequence, a thick sedimentary pile of argillites, greywackes and slates. The Ladner slates are host rocks to replacement type gold deposits such as Carolin Mines, McMaster and Idaho Gold zones.



PART C: PROCEDURES

A "flag" ground control grid was laid out, and ties into the north end of Carolin Mines Grid. Station 5 + 40N on the Base Line of the Stem Grid corresponds to Carolin's 140 + 00N, 16 + 00E. The base line trends $N30^{\circ}W$ and cross lines were flagged at 122 meter (400 foot) intervals, with stations at 7.6 meter (25 foot) intervals along all lines.

The magnetometer survey was completed with McPhar M-700 ground fluxgate magnetometer unit and was operated by Mr. D. Murphy. The survey was conducted on a "loop into base line" method, and all readings on the accompanying map are corrected for diurnal variation. Corrections were completed by Longbar personnel.

The VLF-Electromagnetic (EM) survey was completed with a Scintrex VLF-EM unit, using station NPG, Jim Creek, Washington (18.6 KHz), located at latitude $48^{\circ}12'N$; longitude $121^{\circ}55'W$. The unit was operated by Mr. M. Lee, and first derivatives were calculated by Longbar personnel by a method described by Dr. B. Wittles. (Prospecting with VLF-EM in mountainous regions, Western Miner, Vol. 42, #2, 1969).

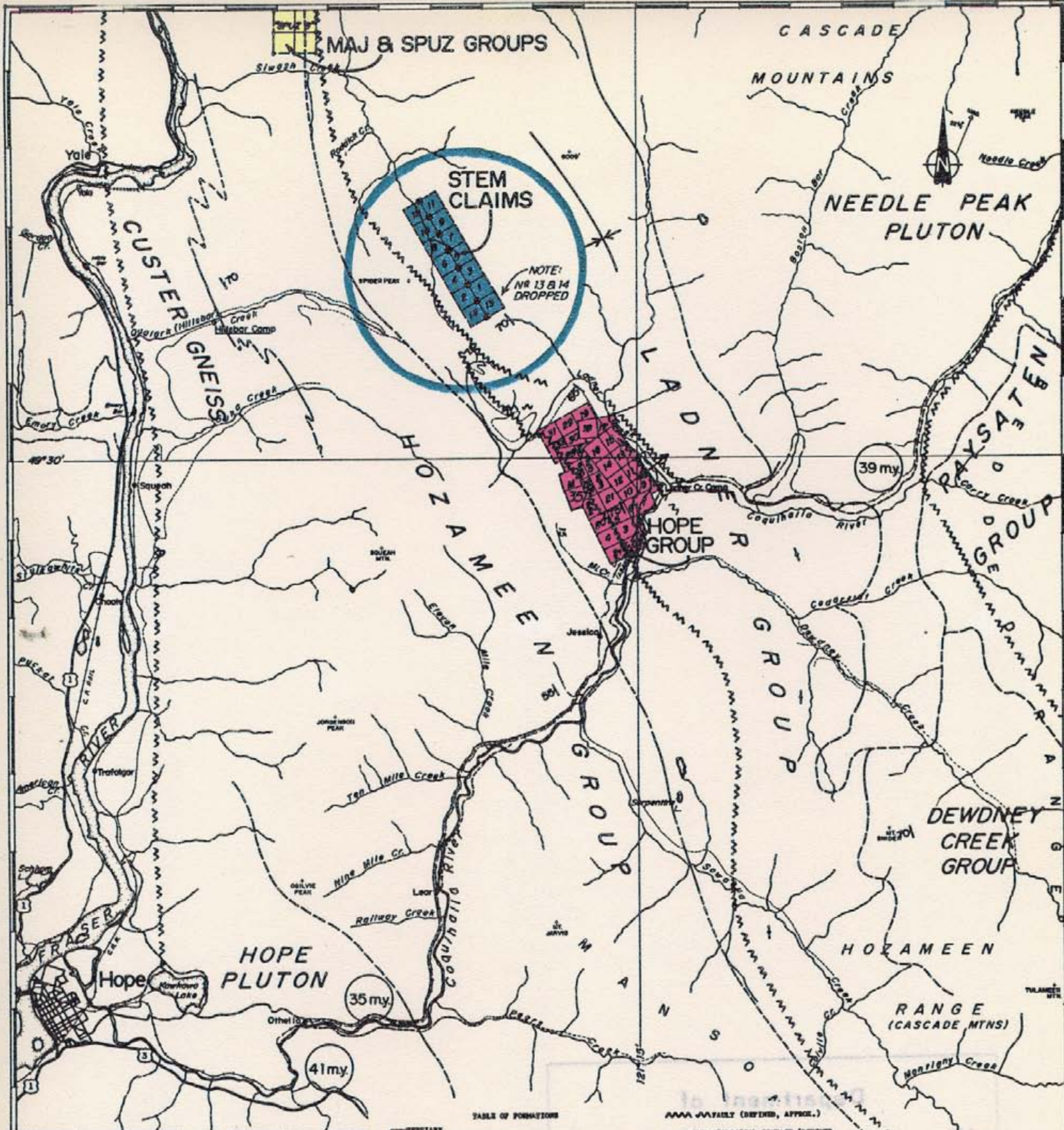
Soil samples were collected along the "flagged" lines at 15 meter (50 foot) intervals and "B" horizon soils were collected. These were placed in grid numbered kraft paper bags,



air dried, packaged in cardboard boxes and transported to North Vancouver where they were analyzed by Min-En Labs for their content in gold.

Maps were drafted in the Delta office of Cochrane Consultants Ltd. under the supervision of D. R. Cochrane, P.Eng.





Longbar Minerals Ltd.

STEM CLAIMS PROJECT
 COQUIHALLA GOLD BELT
 HOPE AREA, BRITISH COLUMBIA.
 NEW WESTMINSTER MINING DIVISION.
 N.T.S.: 92H/6E. & W, 92H/11E. & W.

GENERAL GEOLOGY AND CLAIMS MAP Fig. 2

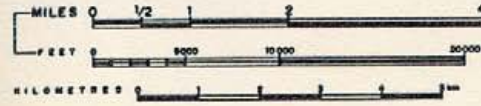


TABLE OF FORMATIONS

TRIARTY	ACIDIC INTRUSIVES (GRANODIORITE, QUARTZ DIORITE)
LATE CRETACEOUS/EARLY TERTIARY	CUSTER GNEISS (MIGMATIZED HOZAMEEN ROCKS)
LOWER CRETACEOUS	PAYMATHEN GROUP (SANDSTONE, CONGLOMERATE)
UPPER JURASSIC	DEWDNEY CREEK GROUP (SANDSTONE, SLATE/TUFF)
LOWER AND MIDDLE JURASSIC	LADNER CREEK GROUP (ARGILLITE, GNEISS, SLATE, ETC.)
UPPER PALAEZOIC	HOZAMEEN GROUP (CHERT, ARGILLACEOUS SLIPTS, METACONGLOMERATE, MIRROR LIGHTSTONE)
PALAEZOIC	COQUIHALLA SERPENTINE BELT (INCLUDES SERPENTINE, METACONGLOMERATE, TALC, SCHIST, MISC. BASIC INTRUSIVES)

--- UNCONFORMITY (SHOWN, APPROX.)
 --- GEOLOGICAL CONTACT (SHOWN, APPROX.)
 --- BEDDING ATTITUDE
 --- ANTIFORM, SYNFORM
 m.y. AGE DATE (MILLION YEARS BEFORE PRESENT)
 See Fig. 2 BETWEEN 1916 AND 1942 FIVE (5) PROPERTIES PRODUCED 3,912 oz. Au FROM 3,105 TONS. (AVERAGE OF 1.3 oz. Au/TON)

- GEOLOGY MODIFIED FROM:
1. GAINES, C.E. (1924) GEOLOGICAL MAP, COQUIHALLA RIVER AREA, G.S.C.
 2. HONGER, J.V.H. (1969) G.S.C. PAPER 69-47, HOPE SHEET, WEST HALF.
 3. HUTAGONY, R.G. & THOMPSON, R.H. (1947) GEOLOGY OF PART OF THE NORTHERN CASCADES, CAN. JOUR. EARTH SCIENCES, VOL. 4.
 4. GRIFFITH, D.J. PERSONAL COMMUNICATIONS.
 5. HORTON, J.M. (1975) GEOLOGY OF HELLBAR GROUP (PRIVATE REPORT FOR GASLIFE MINES LIMITED)
 6. COCHRANE, D.R. VARIOUS PROPERTY EXAMINATIONS, COQUIHALLA GOLD BELT.
 7. STEPHENS, G.C. GEOLOGY OF THE HOPE CLAIMS.
 8. STEWART, J. GEOLOGY OF THE HOPE CLAIMS

PART D: DISCUSSION OF RESULTS

D-1 Magnetometer

Corrected ground magnetometer readings are all relative to a base station at 0 + 00 on the base line, where an arbitrary value of -25 gammas was set. Values range from a low of -85 to a high of +240 gammas, and the majority fall in the 0 to 150 gamma range.

The isomagnetic plan shows that the survey area is characterized by gentle magnetic relief, with no sharp changes in direction or amplitude. The overall trends are northwest, and this presumably indicates the strike attitude of the underlying bedrock. The magnetic response suggests the survey area is underlain by a single fairly homogeneous lithologic unit, presumably the Ladner Slate group.

D-2 VLF-EM Results

The survey area is in relatively steep terrain and therefore unprocessed EM data will contain topographic effects. The first derivative profiles aid in the detection of subsurface conductors and from Figures 4 and 5, a simplified conductor plan was completed (see Figure 7, Compilation). These conductors are predominantly northwest trending and parallel to the magnetometer



trends, suggesting that they are predominantly lithologic in nature (i.e. a pyritic or graphitic horizon). However, a conductor situated in the northeast survey sector has a cross cutting trend and this feature may indicate the presence of a cross cutting shear zone.

D-3 Geochemical Soil Sampling Results

Upper "B" soil horizon samples ranged in gold content from less than the detection limit (0.01 p.p.m. or 10 p.p.b.) to 0.31 parts per million. Values in excess of 0.04 p.p.m. are considered anomalous, and four samples exceed this threshold. They are shown in Figure #6 (in map pocket).

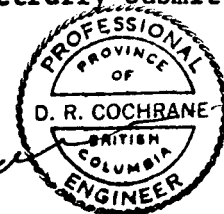
D-4 Compilation

The important Mag, EM and gold in soil features are combined on Figure #7.

The most important coincident event is a northwest trending EM conductor on which there are two geochemical highs and on which there are old workings.

Investigation as to the cause of this anomaly, and the other two above threshold geochemical values is recommended.

Respectfully submitted,



APPENDIX II

Bibliography:

1. CAIRNS, C. E. (1929) The Serpentine Belt of Coquihalla Region, Yale District, B.C., G.S.C. Summary Report 1929-A.
2. CAIRNS, C. E. (1924) Coquihalla Area, British Columbia, G.S.C. Memoir 139.
3. COCHRANE, D.R. Various property examinations and private reports, Coquihalla Gold Belt, B.C.
4. MONGER, J. W. H. (1969) G.S.C. Paper 69-47, Hope Sheet (west half)
5. McTAGGART, K. C., and THOMPSON, R. M., (1967) Geology of Part of the Northern Cascades, Canadian Journal of Earth Sciences, vol. 4
6. STEVENSON, J. S. Lode Gold Deposits, Southwestern British Columbia, B. C. Department of Mines Bulletin 20, part IV.
7. FRAZER, D. C. (1969) Contouring of VLF-EM Data, Geophysics, Vol. 34, No. 6, pp. 958-967.
8. WITTLES, Bryce, (1969) Prospecting with radio frequency EM-16 in Mountainous Regions - Western Miner, Vol. 42 No. 2



APPENDIX III
Conversion Tables

A. Length

Metric	<u>Centimeters</u>	<u>Meters</u>	<u>Inches</u>	<u>Feet</u>	<u>Miles</u>
1 Angstrom	10 ⁻⁸	10 ⁻¹⁰	3.9370x10 ⁻⁹	3.2808x10 ⁻¹⁰	—
1 millimicron	10 ⁻⁷	10 ⁻⁹	3.9370x10 ⁻⁸	3.2808x10 ⁻⁹	—
1 micron	10 ⁻⁴	10 ⁻⁶	3.9370x10 ⁻⁵	3.2808x10 ⁻⁶	—
1 millimeter	0.1	0.001	0.03937	3.2808x10 ⁻³	—
1 centimeter	1	0.01	0.3937	0.032808	—
1 meter	100	1	39.37	3.2808	.0006
1 kilometer	100,000	1000	39,370	3280.8	.6214
<u>English</u>					
1 inch	2.5400	0.0254	1	0.08333	—
1 foot (12 in.)	30.480	0.3048	12	1	.000189
1 yard	91.440	0.9144	36	3	.0005618
1 mile (statute)	160,940	1609.4	63,360	5280	1

B. Weight

Metric	<u>Grams</u>	<u>Kilograms</u>	<u>Oz. Troy</u>	<u>Avoirdupois</u> ^{Lb}	<u>Short Tons</u>
1 milligram	0.001	10 ⁻⁶	3.215x10 ⁻⁵	2.205x10 ⁻⁶	—
1 gram (1000 mg.)	1	0.001	0.032151	0.002205	—
1 kilogram (1000 g.)	1000	1	32.1507	2.2046223	0.0011023
1 metric ton	10 ⁶	1000	32,151	2204.6223	1.1023
<u>Troy</u>					
1 grain*	0.064799	6.480x10 ⁻⁵	0.0020833	1/7000	7.134x10 ⁻⁸
1 pennyweight (24 grains)	1.55517	0.001555	0.05	.00342857	1.71426x10 ⁻⁶
1 ounce (20 dwt.)	31.10348	0.0311035	1	0.0685714	3.4286x10 ⁻⁵
1 pound	373.24	0.37324	12	0.8228569	0.000411428

*1 grain troy = 1 grain apothecary's weight = 1 grain Avoirdupois

C. Assay Values

	<u>Per Cent</u>	<u>*Grams per Metric Ton</u>	<u>Oz. Troy per Short Ton</u>
1 per cent	1	10,000	291.667
*1 gram per metric ton	0.0001	1	0.0291667
1 kg per metric ton	0.1	1,000	29.1667
1 dwt per short ton	0.00017143	1.71426	0.0500
1 dwt per long ton	0.00015306	1.53061	0.0446428
1 oz troy per short ton	.00342857	34.2857	1
1 oz troy per long ton	.00306122	30.6122	0.892859

* or parts per million

D. Mesh Sizes (Us Standard Sieves)

<u>Mesh NBS</u>	<u>Mesh (Tyler)</u>	<u>Opening</u>	
		<u>Microns</u>	<u>Inches</u>
10	9	2000	0.0787
100	100	149	0.0059
325	325	44	0.0017



APPENDIX IV

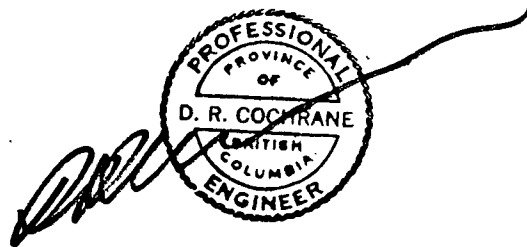
Certificate:

I, Donald Robert Cochrane, of the Municipality of Delta, British Columbia, do hereby certify that:

1. I am a consulting geological engineer with an office at 4882 Delta St., Delta, B. C.
2. I am a graduate of the University of Toronto (1962) with a degree in Applied Geology (B.A. Sc.) and a graduate of Queen's University (1964) with a degree in Economic Geology (M. Sc., Eng.)
3. I have practiced my profession continuously since graduation while being employed by such companies as Noranda Exploration Co. Ltd., Quebec Cartier Mines, and Meridian Explorations Syndicate. I have been in private independant practice since 1969.
4. I have no interest, either direct or indirect in the properties or securities of Longbar Minerals Limited, nor do I expect to aquire any such interest.
5. I am a member in good standing of the Association of Professional Engineers (A.P.E.) of the Province of British Columbia, and also a member of the A.P.E. in the Province of Ontario, Saskatchewan, and the Yukon Territories.

July 9, 1976
Delta, B. C.

(signed) D. R. Cochrane, P. Eng.



STEM 8

STEM 7

STEM 5

-L28N

-L24N

-L20N

-L16N

-L12N

-L8N

-L4N

-0

-14E

-12E

-10E

-8E

-6E

-4E

-2E

-0

-2W

-4W

-6W

-8W

-10W

-12W

-14W

STEM 6

STEM 3

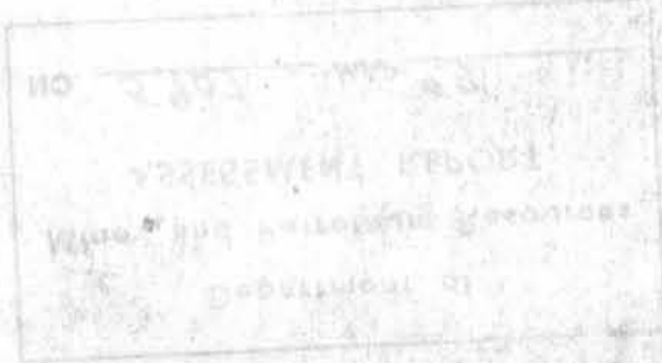
STEM 4

STEM 1

STEM 2

STEM 13

STEM 14



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5907 MAP #3

LEGEND:

H MAG HIGH

POSITIVE VALUES

NEGATIVE VALUES

POST

CLAIM BOUNDARY

LINE (CUT & FLAGGED)

Longbar Minerals Limited

Stem Claims Project
New Westminster Mining Division
British Columbia 92H/11W.

0 100 200 400 800 FT.

1" = 200'

0 50 100 200 m



Cochrane Consultants Limited
4882 Delta Street Delta B.C.

To accompany a report by D.R. COCHRANE, P. Eng., on the "Stem Claims" dated July 9, 1976. Drawn by B.A.C.
Base map from Company "Physical Features Map" Drawn by M.L. November 1975
Revisions:



FIGURE 3
MAGNETOMER PLAN (gammas)

M-3
5907

STEM 8

STEM 7

STEM 5

-L28N

-L24N

-L20N

-L16N

-L12N

-L8N

-L4N

0

-14E

-12E

-10E

-8E

-6E

-4E

-2E

0

-2W

-4W

-6W

-8W

-10W

-12W

-14W

(L140N)

(L136N)

(L132N)

STEM 6

STEM 3

STEM 4

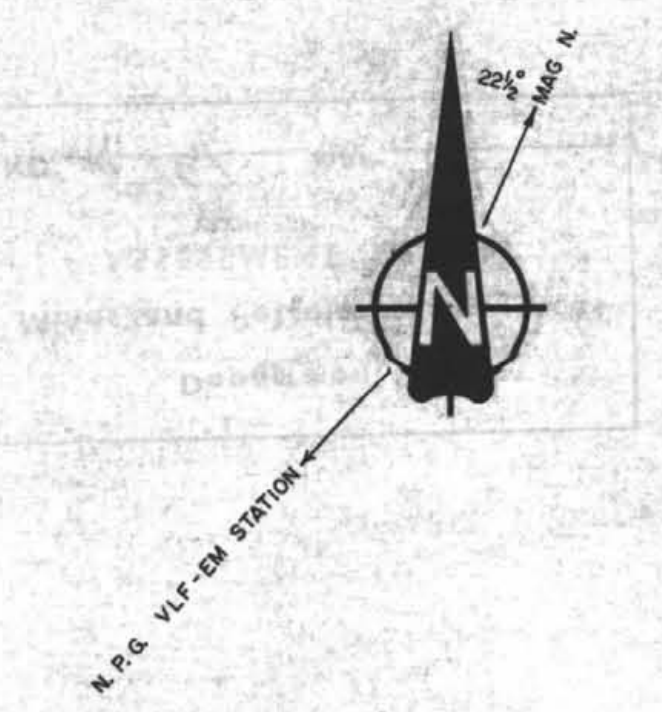
STEM 1

STEM 2

STEM 13

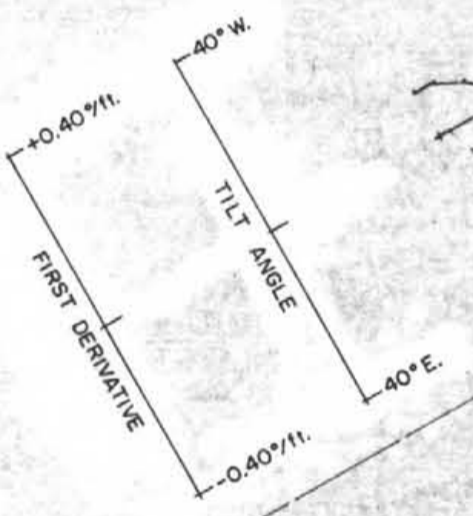
STEM 14

Approx. Claims Boundary



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ASSESSMENT REPORT
NO. 5907 MAP #4

LEGEND:
TILT ANGLE
FIRST DERIVATIVE
POST
CLAIM BOUNDARY
LINE (CUT & FLAGGED)



Longbar Minerals Limited

Stem Claims Project
New Westminster Mining Division
British Columbia 92H/11W.

0 100 200 400 800 FT.

1" = 200'

0 50 100 200 m

1:2400



Cochrane Consultants Limited
4882 Delta Street Delta B.C.

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Revisions:

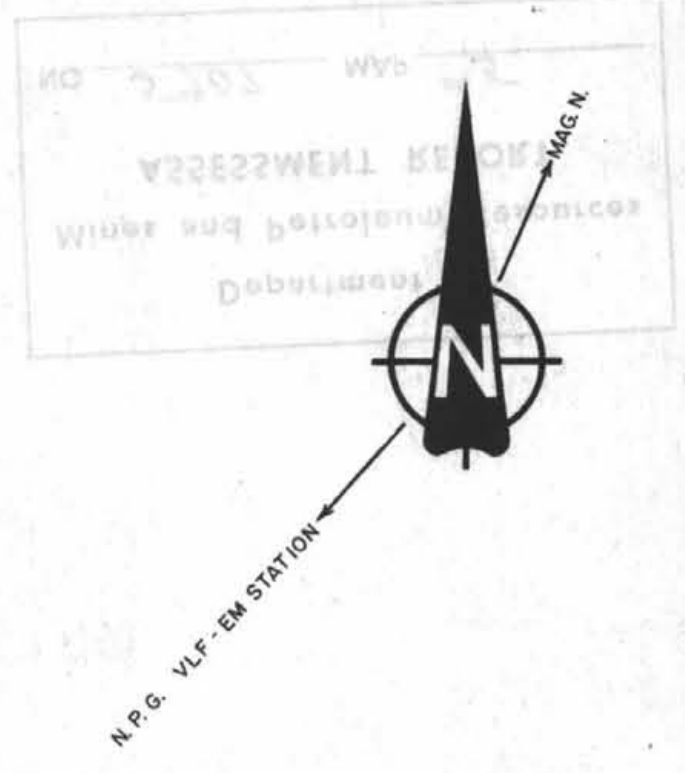


FIGURE 4

VLF-EM TILT ANGLE & FIRST DERIVATIVE PROFILES

AM TOP 2

5907 M-4

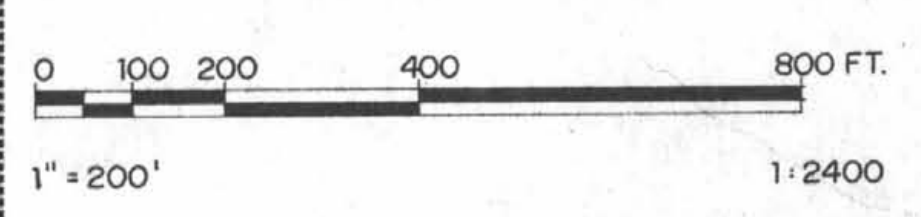


Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5907 MAP # 5

LEGEND:
 ○ POSITIVE VALUES □ POST
 ⊖ NEGATIVE VALUES --- CLAIM BOUNDARY - - - LINE (CUT & FLAGGED)

Longbar Minerals Limited

Stem Claims Project
New Westminster Mining Division
British Columbia 92H/11W.




Cochrane Consultants Limited
4892 Delta Street Delta B.C.

To accompany a report by D. R. COCHRANE, P. Eng., on the "Stem Claims" dated July 9, 1976. Drawn by B.A.C.
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Revisions:



FIGURE 5
VLF-EM FIRST DERIVATIVE VALUES
(DEGREES PER FOOT)

5907 M-5

STEM 8

STEM 7

STEM 5

-L 28 N

-L 24 N

-L 20 N

-L 16 N

-L 12 N

-L 8 N

-L 4 N

0

-14 E

-12 E

-10 E

-8 E

-6 E

-4 E

-2 E

0

-2 W

-4 W

-6 W

-8 W

-10 W

-12 W

-14 W



5907 M-6

5907 M-6

STEM 6

STEM 3

STEM 4

STEM 1

STEM 2

STEM 13

STEM 14

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5907 MAP # 6

LEGEND:
0.04
0.10
CONTOUR INTERVAL □ POST
CLAIM BOUNDARY LINE CUT & FLAGGED

Longbar Minerals Limited

Stem Claims Project
New Westminster Mining Division
British Columbia 92H/11W.

0 100 200 400 800 FT.

1" = 200' 1:2400

0 50 100 200 m



Cochrane Consultants Limited
4882 Delta Street Delta B.C.

To accompany a report by D.R. COCHRANE, P. Eng., on the "Stem Claims" dated July 9, 1976. Drawn by B.A.C.
Base map from Company "Physical Features Map" Drawn by M.L. November 1975
Revisions:



FIGURE 6
GEOCHEMICAL PLAN (Au - p.p.m.)

STEM 8

STEM 7

STEM 5

-L 28 N

-L 24 N

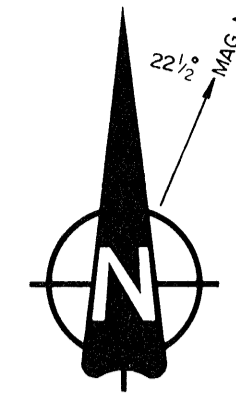
-L 20 N

-L 16 N

-L 12 N

-L 8 N

-L 4 N



STEM 6

SERIES of WEAK CONDUCTORS

MAG LOW

STEM 4

STEM 3

OLD WORKINGS

STEM 1

(L 140 N)

(L 136 N)

(L 132 N)

STEM 2

-14 E

-12 E

-10 E

-8 E

-6 E

-4 E

-2 E

L B

-2 W

-4 W

-6 W

-8 W

-10 W

-12 W

-14 W

STEM 13

STEM 14

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5907 MAP # 7

LEGEND:



EM CONDUCTOR

POST

POSSIBLE FAULT

CLAIM BOUNDARY

SOIL ANOMALY (Au)
LINE (CUT & FLAGGED)

Longbar Minerals Limited

Stem Claims Project
New Westminster Mining Division
British Columbia 92H/11W.

0 100 200 400 800 FT.

1" = 200'

0 50 100 200 m

1:2400



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Base map from Company "Physical Features Map". Drawn by M.L. November 1975
Revisions:



5907 M-7

FIGURE 7
GEOCHEMICAL / GEOPHYSICAL COMPILATION PLAN