6236

'77-#13-#

Geophysical, Geochemical and Geological

ASSESSMENT REPORT

on the

HOPE NO. 1 to No. 32 (inclusive) and Mineral Lease M-35
and SPRING NO. 1 to No. 3 (total 15 units)

known as the

HOPE GROUP PROJECT

situated 27 km. N. E. of HOPE, B. C.

Coquihalla River Area,

New Westminster Mining Division

Latitude 49° 30'N   Longtitude 121° 15' W

N T S 92H 6W 11W

for

LONGBAR MINERALS LTD.

6236

Report by:

D. R. Cochrane P. Eng.
D. J. Griffith B. Sc.
April 8, 1977
Delta, B. C.

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

geology
geophysics
geochemistry

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A-1 PREAMBLE

In the fall and winter of 1976-1977 an exploration crew completed approximately 31.4 km of linecutting, fluxgate magnetometer, geochemical soil sampling, and geological surveys on the HOPE claims, and 1.3 km access road construction on the HOPE and SPRING claims. This work was supervised by the authors.

This report describes the field, lab and data processing procedures, and briefly discusses the results obtained. All of the data is presented in graphic form on the several maps accompanying this report.

In keeping with recent practice, metric units have been used where possible in this report. A conversion table is appended in order to avoid possible misinterpretation.

A-2 SUMMARY & CONCLUSIONS

1. AQUARIUS RESOURCES LTD. through its wholly owned subsiduary Longbar Minerals Ltd. holds title to thirty-two (32) contiguous full size located "old mineral" claims, Mineral Lease M-35, and three (3) located "new" mineral claims totalling fifteen (15) units, situated in the Coquihalla gold belt, New Westminster Mining Division. The claims cover a former producing gold mine, the Emancipation (or Dawson) mine.

2. The claims are located just over 160 km. due east of downtown Vancouver in southern British Columbia. Access during snow free months can be made by car via the Coquihalla Road which proceeds northeasterly from the town of Hope, B. C. the local distribution centre.

3. The Claims straddle a 4 km section of the Coquihalla Gold Belt which has as a central axis the north trending Hozameen Fault which separates the Jurassic Ladner Group on the east from the Paleozoic Hozameen Group and altered basic/ultra basic complex on the west. Modest past gold production from the belt was principally from:

a) quartz veins and silicified breccia systems in Ladner Group host rocks near the Hozameen Fault and complimentary faults

b) shear zone deposits within the Hozameen Fault zone.

A recent discovery by Carolin Mines on the property adjacent to the north is a new type of occurrence which is tenatively classified as a replacement type.

4. Since September 1976, Aquarius Resources Ltd. has conducted an extensive exploration program including:

a) geological mapping @ 1:6000

b) 31.4 km. line cutting

c) 31.4 km. magnetometer survey

d) 31.4 km. soil geochemestry survey

e) soil sample test pits

f) 1.3 km. access road construction.

5. Geological mapping was completed at a scale of 1:6000. The primary target is a splay fault from the main Hozameen Fault, 300 meters north of the Emancipation Mine. This is a similar geologic setting to the McMaster Zone and Idaho Gold Zone in the property adjacent to the north.

6. The magnetometer survey quite easily distinguishes the serpentine/greenstone/sediment contact, and highlights irregularities along this contact which are prime targets for further exploration.

7. Geochemical soil sampling of the "B" soil horizon and subsequent analysis for gold was extremely useful in outlining auriferous zones and several anomalies are apparent. One

anomaly - designated anomaly "B" about 300 m north of the old Emancipation is particulary encouraging since it coincides with a magnetic anomaly. Numerous other anomalies are also present.

8. Access road construction continued up to March 9, 1977, but was halted due to heavy snowfall.

9. Further investigation of the anomalies discovered to date, and "fill in" work is required on the Hope Group Project.

Respectfully submitted

PROFES. PROVINCE OF D. R. COCHRANE BRITISH COLUMBIA ENGINEER

D.R. Cochrane P. Eng.

D.J. Griffith B.Sc.

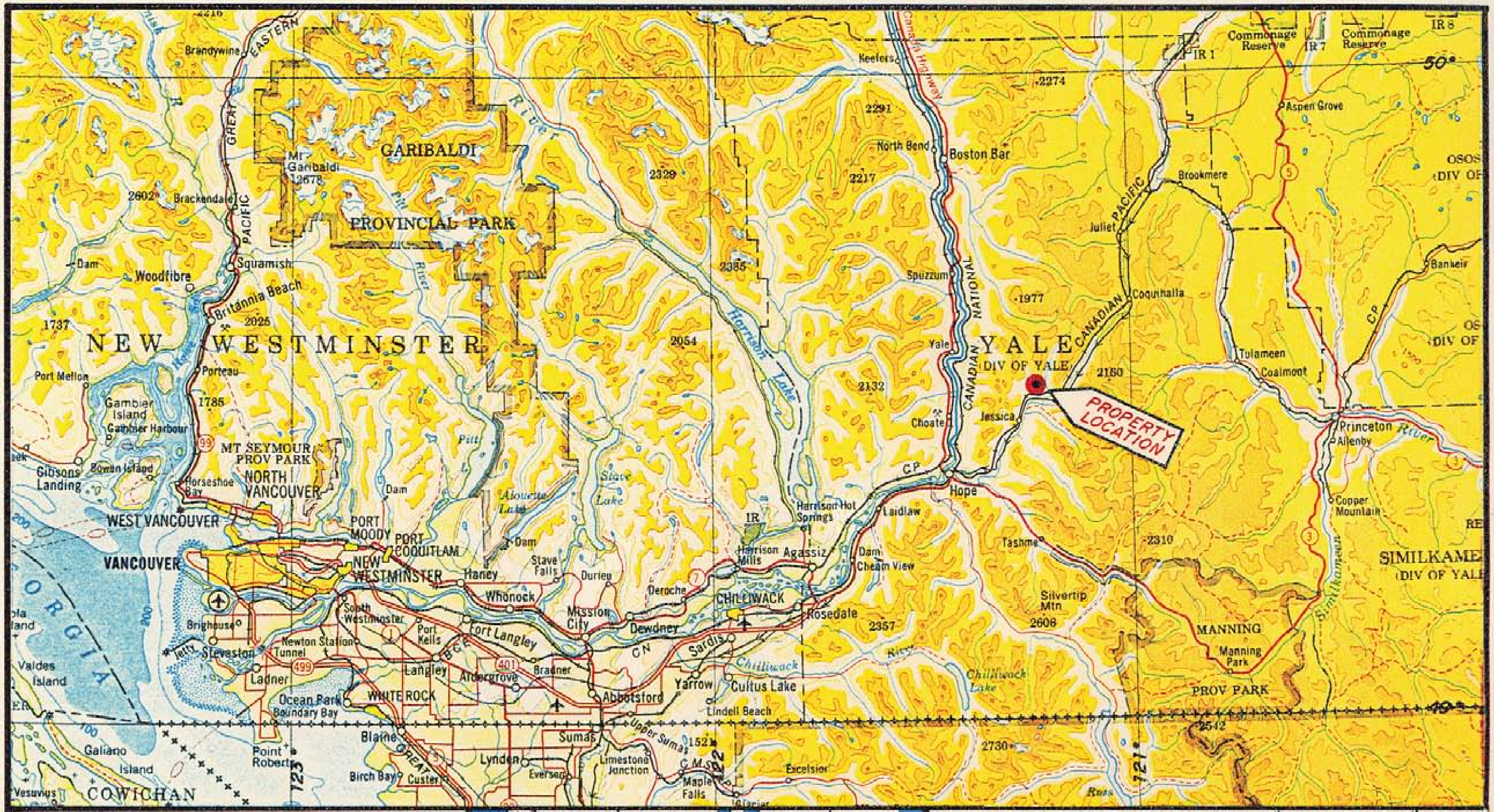
Delta, B.C.

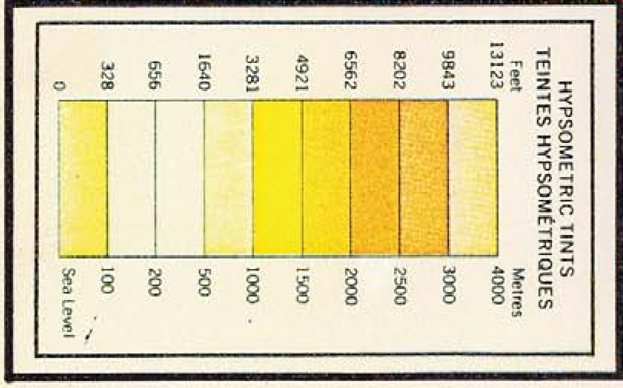
April 8, 1977.

PART B SETTING

B-1 LOCATION AND ACCESS

The HOPE CLAIMS are favorably located and during snowfree months are easily reached by car, being just over 160 km. due east of Vancouver, in southern British Columbia. Normal access is north-easterly from Vancouver on highway # 1 to the town of Hope, then through downtown Hope, past Kawkawa Lake, and onto the Coquihalla road. The Coquihalla Road is built, for most part, on the abandoned West Kettle railway grade. This gravel road proceeds north-easterly, following the Coquihalla River to the southern portion of the HOPE GROUP CLAIMS, and these are situated at mile sixteen (27 km.) along the road from Hope. The claims lie on the south and east facing ridge lying immediately west of LADNER CREEK.





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

AQUARIUS RESOURCES LTD.

HOPE GROUP PROJECT — NEW WESTMINSTER M. D.
BRITISH COLUMBIA — CANADA

LOCATION MAP — *Figure 1*

0 5 10 20 30 MILES (1" = 15.75 MILES)
DWN: B.A.C., FEB/77
(1:1,000,000)
0 5 10 20 30 40 KILOMETRES

Cochrane Consultants Limited
4882 Delta Street — Delta B.C.

#6236

The National Topography System (N.T.S.) code for the area is 92H/6W and 11 W. The center of the claims block lies at latitude 49° 30' North and longitude 121° 15' West.

B-2 CLAIMS INFORMATION

The HOPE GROUP comprises a total of thirty-two (32) contiguous (old) located mineral claims, fifteen (15) new units and MINERAL LEASE M-35 (lot 1299, the Raymond: and lot 1300, the Sunshine). They are registered in the New Westminster Mining Division, District of Yale. (see table on following page).

The following table lists pertinent claims information.

CLAIM NAME	RECORD NUMBER	*EXPIRY DATE
Hope 1 to 9 incl.	25391 to 99	April 20/78
Hope 10	27779	May 19/78
Hope 11 to 13 incl.	28472 to 74	May 17/78
Hope 14 to 18 incl.	28475 to 79	May 17/78
Hope 19	28529	June 19/78
Hope 20 to 28 incl.	26578 to 86	June 21/78
Hope 29 to 32 incl.	28530 to 33	June 19/78
Mineral Lease 35	Lots 1299 & 1300	-----
Spring 1 (6 units)	Pending	Feb. 22/78
Spring 2 (1 unit)	"	"
Spring 3 (8 units)	"	"

Title to the claims listed above is held by Longbar Minerals Ltd., a wholly owned subsiduary of Aquarius Resources Ltd.

* as of March 15, 1977

B-3 GENERAL SETTING

The Hope Claims lie within the northern portion of the Cascade Mountains, a physiographic region characterized by rugged peaks, deeply incised creek valleys, and a dense forest cover. Elevations in the area range from 30 metres above sea level at Hope, B.C. (the confluence of the Fraser and Coquihalla Rivers), to peaks in excess of 1,800 metres. The town of Hope, B.C. is a major local distribution centre with a variety of services and an excellent, experienced, labour pool.

The northwest trending ridge covered by the Hope Claims climbs from the Coquihalla Valley to an elevation of just over 1,200 metres above sea level, through a horizontal distance of approximately 850 metres. Portions of the claim group are "logged off" and logging operations are numerous in the area. The forest cover consists of well developed stands of douglas fir, red cedar, and hemlock at lower elevations, to balsam, hemlock, and yellow cedar at higher elevations. The climate is a modified wet coastal one with mild, damp, summers: and damp, snowy, winters interspersed with above zero, freshet spells.

Freshets rapidly create swollen rivers and streams, and access roads are occasionally washed out and otherwise damaged.

The soil cover is widespread but fairly thin at higher elevations consisting of transported glacial overburden and hybrid soils (various mixtures of residual and transported types).

B-4 HISTORY

The first lode gold prospecting was on outgrowth of the placer gold mining along the Fraser River but very little was accomplished until the turn of the century. In 1906 William Teague discovered gold in quartz veins near Ladner Creek and by the fall of 1907 he had staked several claims and had unknowingly discovered what is now called the COQUIHALLA GOLD BELT (named by Dr. Cairnes of the Geological Society of Canada in the 1920's and compared with the mother lode gold belt of California.)

In 1913, three prospectors named Merrick, Thompson and Beach staked what is now called the Emancipation, or Dawson Gold Mines, and covered by the HOPE GROUP claims. The Emancipation produced 2,897 ounces of gold and 605 ounces of silver between 1916 and 1941 (B.C. Dept. of Mines Records). Four additional properties produced small amounts of gold from along the belt in the early 30's and 40's but total production from all properties is quite modest at just under 4,000 troy ounces. New life was given to the camp in 1973 when the price of gold increased from the government controlled and fixed $35.00 per ounce level that had prevailed since 1933 to an average yearly level of $128.00 per ounce in 1976. Recent exploration to the north of the HOPE GROUP, on ground held by Carolin Mines, has resulted in the discovery of a large tonnage gold deposit scheduled for underground work this upcoming spring.

In 1971 most of the claims now collectively called the HOPE GROUP were staked by Mr. J. Stewart and Dr. K. Warren Geiger and since that time there has been exploration work conducted on the claims each year. In the spring of 1976, Cochrane Consultants were engaged by Longbar Minerals Ltd. to review the results of the work to that date and to make recommendations.

The results of this study are contained in a report dated March 5, 1976, within which a two phase exploration work program was recommended.

During the latter part of 1976 and early 1977 the part "A" portion of the March 1976 recommended work has been completed under the direction of the authors.

B-5 1976-77 EXPLORATION PROGRAM

1. Line cutting and ground fluxgate magnetometer surveying/total of 31.4 line km.
2. Geochemical orientation work with the excavation of four (4) trenches by bulldozer and the analysis of various soil horizons for their content in several metals.
3. Geological mapping and sampling. Mapping on a 1"=500' scale.
4. Geochemical soil sampling and the collection of over 2,000 samples and their analysis for gold content.
5. Staking of fifteen (15) additional units.
6. Drafting and interpretation of geological, geophysical and geochemical data.

The total expended to date is over $40,000 and a portion of this expenditure has been scheduled to obtain assessment work credits on all located claims.

PART C GEOLOGY

C-1 GENERAL

Most of the claims area has been mapped at a scale of 1:6,000, and the bedrock geology is plotted on Fig. 24 which accompanies this report.

The claims straddle the Hozameen Fault which has been traced by the Geological Survey of Canada over ninety(90) kilometres along strike. The Fault is between the Lower-Mid Jurassic Ladner Group to the east and the Paleozoic Hozameen Group to the west Over most of the known strike length of the fault, an alpine ultramafic known as the Coquihalla Serpentine Belt is present immediately west of the fault. This Serpentine Belt varies from non existant to over 1.2 km. in width.

In the claims area all rock units trend approximately $130^{\circ}/75^{\circ}$ SW.

C-2 DESCRIPTION OF ROCK UNITS (from West to East)

UNIT F---Ribbon chert, minor phyllite, minor aphanitic andesite

UNIT F is part of the Paleozoic Hozameen Group, and has been mapped by the author from the Coquihalla River North as far as Alexandra Bridge.

UNIT A---Serpentine, altered diabase dikes, serpentinized diabase.

UNIT A is the Coquihalla Serpentine Belt, an alpine ultramafic over seventy (70) km. in length. The serpentine is a massive dark green to black rock with increased shearing in the vicinity of both east and west contacts. Previous thin section work (Cairnes, 1929) indicates that this serpentine was derived from a peridotite, due to relict crystals of olivine and possible pyroxene. Even in occasional hand specimens it is possible to tenatively identify relict olivine crystals. Minor occurrences of veinlets of carbonates, chrysoltile, and talc shears are sometimes found within the serpentine. In the past occassional spectacular samples of free gold in the talc have been reported.

Within the serpentine belt two modes of occurrences of diabase are found: although to differentiate them it is necessary to be able to view the contact relationship with the serpentine. In one type of occurrence the diabase is clearly intrusive into the serpentine, with chilled margins up to 1.0 m. in width. In the other type of occurence the diabase has a gradational contact with the serpentine, with both progressive whole rock serpentization of the diabase and developement of serpentine along fractures in the diabase. No chilled margins have been observed in this last node of occurrence of the diabase.

UNIT G---Fine grained diabase

UNIT G is a grey-green fine grained - very fine grained diabase with occassional composition banding and gneissic texture. The mafics have all been chloritized. No thin section work has been done on this unit, nor have its contact relationships been established with any of the other units.

UNIT B---very fine grained extrusive greenstone (meta andesite) tuffaceous argillite and wacke.

UNIT B forms a discontinuous belt between the Serpentine Belt and the Ladner Group sediments. In a very few outcrops definite pillow structures have been identified, suggesting subaqueous volcanism.

UNIT C---lithic wacke, green wacke and argillite

UNIT C is a discontinuous zone of greater than 10% lithic wacke and is the western most exposure of the Ladner Group. The lithic fragments are similar to various argillites which appear throughout the sedimentary sequence and appear to have been only semi-consolidated at the time of deposition. This appears to be an intraformational wacke or breccia. In a hand specimen these rocks appear to be lithic tuffs, but thin section work confirms that the "lapilli" are indeed argillite fragments (Montgomery, 1974). Repeated graded bedding is sometimes observed in these lithic wackes but gives conflicting evidence as to "tops".

UNIT D---argillite, slate, wacke

UNIT D is the bulk of the Jurassic Ladner Group. It is composed of dark grey-green grey thinly interbedded argillite and very fine grained wackes which have been metamorphosed into phyllites and slates. The argillites and wackes sometimes exhibit strong soft sediment deformation and are considered to be flysh deposits. Bedding where observed, and fissility and/or slaty cleavage are all subparralled, although careful examination of selected specimens north of the property has revealed at least three, and possibly four deformations.

C-3 CONTACT AND AGE RELATIONSHIPS

UNIT A is clearly fault bounded. Increased shearing within the serpentine near both contacts and developement of a strong talc-carbonate shear along the Hozameen Fault are evidence for this. As the Serpentine Belt is in contact with all other units, it was therefore the last unit to be emplaced in its present position, with the possible exception of UNIT G, which is not understood at this time.

UNIT D and UNIT C are conformable. Work done by others, (Cairnes 1924, McTaggart 1970, Monger, 1969) indicates that the western limit of UNIT C is the base of the Ladner Group, with an unconformity existing between UNIT C and UNIT B.

In all exposures seen to date by the author, including underground workings along the contact between UNIT C and UNIT B, the greenstone and the sediments are at least structually conformable, with the bedding altitudes in the sediments being essentially parallel to the contact. Some shearing and quartz veining has taken place along the contact, and in the past considerable drifting has been done on this contact, both at the Emancipation Mine (Boulder Vein) and at the Aurum Mine (#3 adit) just North of the claim group.

UNIT B and the Serpentine Belt were considered to be a basic and ultra basic member of the Hozameen Group by Cairnes (1924) and Monger (1969), the very definite fault contact between the serpentine and meta andesite (UNIT B) in the claims area suggest UNIT B is more likely conformable to the Ladner Group, and any unconformity that exists would be occupied by the Serpentine Belt itself.

A very tenative short history of events is listed below.

TIME	EVENT	
Paleozoic	quiet marine deposition of ribbon chert, minor volcanism	Hozameen Group
	HIATUS	
JURASSIC	short period of submarine volcanism	UNIT B
	short period of rapid deposition of flysh deposits	UNIT C
	long period of deposition-flysh	UNIT D
	HIATUS	
	faulting along unconformity between UNIT B and UNIT A	Hozameen Fault

	Intrusion of peridotite and diabase sills into fault zones	
	Serpentization of peridotite, minor serpentization of diabase	Coquihalla Serpentine Belt
	Intrussion of diabase sills into Serpentine Belt	
	Further Faulting along both contacts of serpentine belt, with extensive shearing and splay faulting on eastern contact.	
	Mineralization along fractures or fracture systems	

PART D MAGNETOMETER SURVEY

D-1 PROCEDURE

Due to lack of control, all previous magnetometer surveying was discarded.

A main base station in a "magnetically quiet" but easily accessable area was established and tied in to Carolin Mines main base station, which gave it a relative value of $\overline{400}\ \gamma$. At this new main base station a Scintrex MF-2 fluxgate magnetometer was coupled to an Esterline - Angus continuous chart recorder in order to record the diurnal variation in the earth's magnetic field.

McPhar M-700 fluxgate magnetometers were used by the field crew to take readings along pre-cut lines 100 ft (30m) apart at 50 ft (15m) intervals. Three readings were taken whenever the baseline was crossed, and the main base station was checked into at the beginning and end of each working day.

Readings were corrected for diurnal variation and instrument drift, and the results plotted in FIG. 19.

D-2 RESULTS

Fig. 19 and 21 show the results obtained at a scale of 1:1200.

The results show considerable range, with erratic values ranging from as low as $\overline{30,440}\,\gamma$ to a high of $20,770\,\gamma$. A frequency histogram of a sample of over 200 values plotted in Fig. 21 shows a multimodal distribution, with the primary mode ranging from $\overline{1,100}\,\gamma$ to $\overline{500}\,\gamma$ with the median approximately $\overline{100}\,\gamma$. A secondary mode is also readily discernable in the $1,300\,\gamma$ to $2,700\,\gamma$ range. The two families of magnetic values in general reflect two rock types, the primary mode reflects the magnetic response of the Ladner Group sediments, with the secondary mode reflects magnetic responses of the serpentine.

The Isomagnetic Plan (Fig. 21) clearly delineates the eastern contact of the serpentine belt, outlined by the steepest magnetic gradiant (highest first derivative). Three apparent splay faults are outlined by the magnetometer survey, in the areas of B.L. 49S, B.L. 60S, and B.L. 74S. In the past these splay faults have proved to be prime prospecting targets for gold.

Superanomlous magnetic values within the serpentine belt are probably due to concentrations of magnetite and should be trenched.

E-2 RESULTS

The content of the gold in the "B" horizon soil samples ranges from less than 5 ppb to a high of 6,250 ppb (excluding extremely high samples from the old dumps).

NOTE: 1,000 ppb≡1 ppm (part per million) ≡1 gram per tonne (metric ton) ≡ 0.029 troy ounces per short ton.

A frequency histogram of over 200 random values is plotted in Fig. 22 and shows that statistically, background is less than 20 ppb. For clarity in presentation, the values were log contoured at 15 ppb, 45 ppb, 105 ppb, 225 ppb, 465 ppb and 945 ppb in Fig. 22, with any value over 105 ppb considered to be strongly anomalous.

The coverage to date has outlined two larger areas that are moderately to strongly anomolous - anomaly A being on and around the old Emancipation Mine, and anomaly B some 300 m to the North. Many other smaller scale anomalies are present, and all require more detailed investigation.

Care must be taken in interpretation of the soil values, as soil type and thickness varies considerably. Four test pits were dug with a bulldozer in the relatively flat area on top where problems were expected to occur. Although there was no indication on the undisturbed surface, bedrock varied in depth from less than 1.0m to greater than 3.5 m. A persistent thick layer of impervious boulder clay or hardpan was present in all test pits, and this could effectively prevent the metal content of the "B" soil horizon from reflecting the metal content of the bedrock. Soil geochemistry profiles were taken, and samples analysed for Au, Ag, Cu, Hg, As, Pb, Zn, with no consistent advantage shown for any element tested. The results are shown in Fig. 15 through 18.

PART F PHYSICAL WORK

F-1 Soil Sample Test Pits

TEST PIT	LOCATION	DIMENSION(m)		
		length	width	depth
1	39.25S 1.0W	6.0 m	4.2 m	2.2 m
2	38.0S 3.5E	9.0 m	4.2 m	3.5 m
3	43.9S 3.2E	9.0 m	4.2 m	1.1 m
4	40.0S 1.0E	9.0 m	4.2 m	0.9 m

These pits were all dug with a Caterpillar D-7 F crawler tractor, and locations are plotted on Fig. 20 & 22.

F-2 ACCESS ROAD

0.3 km of 4m wide access road was constructed on the Hope 12 mineral claim during January, 1977, and 1.0 km of 4m wide access road was constructed on the Hope 22 & 24 mineral claims between Feb. 25, 1977 and March 10, 1977. These new roads are plotted on Fig. 2c, and were constructed using a Caterpiller D-7 crawler tractor.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
D. R. COCHRANE

D. R. Cochrane P. Eng.

D. J. Griffith B. Sc.

April 8, 1977

Delta, B. C.

APPENDIX 1

ASSESSMENT WORK DETAILS

PROJECT:	HOPE GROUP PROJECT
LOCATION:	17km. N.E. of Hope, B.C.
OWNER:	Longbar Minerals Ltd.
SUMMARY OF WORK:	line cutting, soil sampling, magnetometer surveying, geological mapping, soil sample test pitting, access road construction.
WORK CONTRACTED BY:	Cochrane Consultants Ltd., Min-En Labs Ltd., Numan's Enterprises Ltd.
a) linecutting:	31.4 km. blaze & flag compass line station every 50 ft. (15m)
b) soil sampling:	approx.2,000 soil samples @ 50 ft. (15m) intervals along 31.4 km. of grid lines. Samples analysed for Au.

APPENDIX 1 (cont.)

c) Magnetometer Survey:	approx. 2,000 readings @ 50 ft. (15m) intervals along 31.4 km. of grid lines. Scintrex MF - 2 & McPhar M-700 fluxgate vertical field instruments used.
d) Geological Mappings:	part of claims area mapped at 1:6000
e) Test Pits:	4 soil sample test pits dug with D-7 F
f) Access Road Const.	1.3 km x 4m access road construction with D-7 F
g) Data Processing:	base map preparation, drafting, report preparation.

Field Work Periods	Sept. 15-30	1976
	Nov. 27-Dec.22	1976
	Jan.23-30	1977
	Feb.7-Feb.10	1977
	Feb.23-Mar.10	1977

APPENDIX 11

PERSONNEL AND DATES WORKED

David Griffith Geologist	Sept. 15 - Oct. 5,	1976	10¼ days
	Nov. 8 - Dec 23,	1976	8¼ days
	Jan.6 - 31	1977	11¼ days
	Feb. 4 - Feb. 23	1977	11½ days
	Feb. 28 - Mar. 30	1977	13 days
Charles Brinkley casual labour	Dec. 10-11	1976	1½ days
Paul Wilson Prospector	Nov. 27 - Dec. 22	1976	14-3/4 days
Bill Chase Prospector	Nov. 27 - Dec. 22	1976	19½ days
Dave Murphy Prospector	Nov. 27 - Dec. 22	1976	19 days
Dave Heino Prospector	Nov. 27 - Dec. 22	1976	19 days
Dave Heino Prospector	March 1 - Mar. 9	1977	6½ days
D.R. Cochrane P. Eng.	Dec. 6 - Jan. 6		1½ days
	Feb. 19 - 22		1 day
	Mar. 10 - Mar. 31		1 day
B. Cochrane Cartographer			250 hours

APPENDIX 111

CERTICICATE:

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 Street, Delta, British Columbia. V4K 2T8

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 and while being employed by such companies as Noranda Exploration Co. Ltd., Quebec Cartier Mines, and Meridian Explorations Syndicate. I have been in private independent practice since 1969.

4. I have no interest, either direct or indirect, in the properties or securities of Longbar Minerals Ltd., or Aquarius Resources Ltd., nor do I expect to acquire 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 Provinces of Ontario, Saskatchewan, and the Yukon Territories.

April, 1977
Delta, B.C.

(signed) D. R. Cochrane p. Eng.

APPENDIX 111

CERTIFICATE:

I, David Julius Griffith, of the City of Vancouver, British Columbia, do hereby certify that:

1. I am a geologist with an office at 4882 Delta Street, Delta, British Columbia, V4K 2T8

2. I am a graduate of Queen's University (1970) with a degree in English (B.A.) and a graduate of the University of British Columbia (1973) with a degree in Geology (B.Sc. Hon.)

3. I have practiced my profession continuously since graduation while being employed by such companies as Carolin Mines Ltd., Precambrian Shield Resources Ltd., and Cochrane Consultants Ltd.

4. I have no interest, either direct or indirect, in the properties or securities of Aquarius Resources Ltd, or Longbar Minerals Ltd, nor do I expect to aquire any such interest.

(signed) D.J. Griffith, B. Sc.

April, 1977
Delta, B.C.

APPENDIX 1V

COST SUMMARY

Cochrane Consultants, Min En Labs, Stewart Contracting and Numan's Enterprises all worked on a contractual basis on the Hope Group Project. Cost summary prepared from Cochrane Consultants records.

1)	Cochrane Consultants Nov. 3rd. 1976 invoice (geological mapping)	$ 1,536.42
2)	Cochrane Consultants Feb. 7th. 1977 invoice (line cutting, soil sampling, mag. survey)	13,568.06
3)	Wages paid to Longbar prospector, Mr. Dave Murphy. (line cutting, soil sampling, mag. survey)	1,547.00
4)	Stewart contracting (digging test holes)	910.00
5)	Cochrane Consultants, to Mar. 9, 1977 (mag. survey, data processing)	4,644.59
6)	Min En Labs (analyze 2085 soil samples for Au)	8,027.25
7)	Numan's Enterprises (road building)	6,518.68

APPENDIX 1V (cont.)

8)	Numan's Enterprises (road building	$ 935.30
9)	Cochrane Consultants to March 31, 1977 (data processing, work supervision, report preparation)	3,200.00
	TOTAL	$40,887.30

Cost appropriation:

HOPE GROUP	$ 19,771.76
SPRING GROUP	$ 21,115.54

NOTE: Sufficient expenditures relating to field work done after the location of the Spring claims have been made to qualify for the assessment work credits claimed.

Aquarius Resources Ltd. - 2 - November 3, 1976

Sub-Total from previous page pd. $ (1,[illegible]5.0[illegible]) $ 1,[illegible]5.0[illegible]

Re: [illegible] Group Project to Oct. 31, 1976

1. D. Griffith

Sept. 15	Locate old grid	[illegible] day
[illegible]	Map surface	1 day
[illegible]	"	1 day
[illegible]	"	1 day
[illegible]	"	1 day
[illegible]	" , plot rough map	1 day
21	"	1 day
23	"	[illegible] day
[illegible]	Review maps with Jon Stewart	[illegible] day
[illegible]	Go through [illegible] with J. Stewart	1 day
[illegible]	Examine surface drawings with J. Stewart	[illegible] day
Oct. 1	Review maps with J. Stewart	3/4 day
[illegible]	Plot 1" = [illegible]' geology	[illegible] days
[illegible]	"	3/4 day
	Total	10 [illegible] days

10[illegible] days @ $110.00/day $ 1,1[illegible].[illegible]0

2. Disbursements

6 days 4 x 4 Rental @ $[illegible]0.00/day $ [illegible]0.00

Expenses (see receipts) [illegible]

$ [illegible] [illegible].[illegible]0

$ 1,496.40

Less Advance from Aquarius [illegible].00

$ [illegible].40 $[illegible].40

3. Drafting - 3.3 hours @ $9.55 = $ 31.51

Reproduction [illegible].[illegible]1

$ [illegible].02 50.02 50.0[illegible]

Total Owing $ 2,[illegible]
- 1,[illegible]5.0[illegible]
$ 1,036.[illegible]

FP Dec 23/76
& CQP

D. R. [illegible], [illegible]

February 7, 1977.

Dr. W. Geiger,
Aquarius Resources Ltd.,
12225 [illegible] Avenue,
EDMONTON, Alberta,
T5M [illegible].

INVOICE

Re: Hope Group

1. D. R. Cochrane, P.Eng.
   Dec. 6 – ½ day
   Dec. 14 – ½ day
   Dec. 21 – ½ day
   Jan. 6 – ½ day
   [illegible] days @ $200.00 = $ [illegible]

2. D. Griffith
   1976 – Nov. 8 – Dec. 1 – 5½ days @ $110.00 = $605.00
   Dec. 2 – Dec. 23 – 8¼ days @ $110.00 = $907.50
   1977 – Jan. 6 – Jan. 31 – 11¼ days @ $110.00 = [illegible]
   $ 2750.00 — 2750.00

   Expenses – see attached copies
   to Dec. 1 — $ 1,118.50
   to Dec. 23 — 590.45
   to Jan. 31 — [illegible]
   Rental – 4 x 4 – 4 3/4 days @ $20.00 — 95.00
   771 mi. @ .20/mi. — 154.20
   Serv. charge on past due acct. — [illegible]
   $ 2,557.02 — 2557.02

3. Payroll
   Charles Brinkley – 2.5 day — $ 100.00
   Paul Wilson – 16 3/4 days @ $60. — [illegible]
   Dave Haines – 19½ days @ $70. — [illegible]
   Bill Chase – 19 days @ $70.00 — [illegible]
   [illegible]
   Plus ISI — [illegible]
   [illegible] — Sub Total $ [illegible]

Aquarius Resources Ltd.
(Revision)

Feb. 7, 1977

	Balance Forward	$ 9330.02

4. Office Expenses

Photocopies - 15 x .15	$ 2.25	
Reproduction - in excess on original billing	[illegible]	
Drafting - 73.5 hours @ $9.00	[illegible]	
Computer Controls - Inv. for Chase Res.	[illegible]	
Accounting - 5 days @ $25.00	[illegible]	
Telephone calls - $100.02 + 1.5% ($1.52)	[illegible]	
Maps - $5,000 @ 1.5%	75.00	
	$1150.67	1150.67

5. Invoices Paid

Western Parcel	$ 6.20	
Dobbin Equipment Ltd.	56.05	
Gordon Johnston	197.50	
Chamber Lodge	050.65	
Lincoln Lake	65.00	
" "	920.00	
Phoenix Geophysics	150.00	
Bohack Rentals	201.00	
Columbia Geophysical	40.00	
	$2205.59	2205.59

6. Bush Expenses

Supplies Used - 7 rolls flagging @ $1.10	7.70	
L 17 - Ring - 6 days @ $10.50/day	63.00	
500 soil sample bags @ [illegible] ea.	37.00	
12 Alkaline "D" cells @ $1.25 ea.	15.00	
16 Alkaline "C" cells @ $1.25 ea.	20.00	
Gas - $55.65 + 1.5% ($1.10)	[illegible]	
Bill Chase's expenses	[illegible]	
	$[illegible]	[illegible]
		$ 12500.06

Advance - $15,000.00
[illegible]
[illegible]

D. H. Cochrane, P.Eng.

STATEMENT Phone 858-6037

O. T. STEWART CONTRACTING

BOX 147, SARDIS, B.C. V0X 1Y0

Dec 1976

M Longbar Minerals Ltd
Box 129 Vananda B.C.

DATE	DESCRIPTION	PRICE	
Nov 30	Rd Repair 6 hr @ 41.00		
Dec 1, 2	Test Holes 14 "	820	00
	Rental on 4x4 30.00 per day	90	00
		910	00

Jim

O.K. Hope

Yours Stewart

SALES & TIME SLIP Phone 858-6037

O. T. STEWART CONTRACTING

Box 147, Sardis, B.C. V0X 1Y0

Dec 1976

M Longbar Minerals Ltd
Box 129 Vananda B.C.

DATE	DESCRIPTION	HOURS
Nov 30	Rd Repair	6
Dec 1	Test Holes	7
" 2		7
	TOTAL	20

№ 23

March 9, 1977.

Mr. D. Gilmore,
Aquarius Resources Ltd.,
12225 [illegible] Avenue,
Edmonton, Alberta,
[illegible]

INVOICE - [illegible] Group

1. D. R. Cochrane, P.Eng.,
Feb. 19 - mag data - ½ day
Feb. 22 - business - ½ day
1 day @ $220.00 — $ 220.00

2. D. [illegible]
Feb. 4 - Review program costs - 1 day
Feb. 5 - mobilize mags, invoicing - 1 day
Feb. 6 - cut grid - 3/4 day
Feb. 7 - set up mag base station - 1 day
Feb. 8 - mag 2 line miles - 1 day
Feb. 9 " - 1 day
Feb. 10 - mag 1 line mile, [illegible] - 1 day
Feb. 11 - finish mag corrections - 3/4 day
Feb. 12 - organize for staking - ½ day
Feb. 14 - stake Spring claims - 1 day
Feb. 15 - stake Spring claims - 1 day
Feb. 16 - stake " ", [illegible] - 1 day
Feb. 17 - type out claim records - 1 day
Feb. 18 - rough plot mag. - 1 day
Feb. 19 - finish contour[illegible] - 3/4 day
Feb. 21 - [illegible] 1"=100' mag & [illegible] - ½ day
Feb. 22 - review program with [illegible], [illegible], & [illegible] - 1 day
(record & transfer claims)
Feb. 23 - [illegible] proposed cut access - 1 day

13 3/4 days @ $[illegible] — 2,[illegible]

Expenses - see attached — [illegible] 897.12
4 x 4 Rental - 9 days @ $20.00/day — [illegible]
10[illegible] mi. @ $0.20/mile — [illegible]

$ [illegible]
3,230.62

Hope Group

Sub Total Forward $ 3,230.62

3. Office Expenses
Postage - 15 @ $.12 $ 1.80
Telephone Calls 100.27
Accounting - 2 days @ $45.00 90.00
Drafting - 96 hours @ $10.00 960.00
Reproduction Costs 48.65
$1200.72 1,200.72

4. Invoices Paid on Your Behalf
Columbia Geophysical Supplies $ 40.00
Tournigan Mining Explorations Ltd. 225.00
Carolin Mines Ltd. 500.00
Min-En Labs 6027.25
$6792.25 6,792.25

5. Bush Expenses
Supplies used from Cochrane Consultants Stock
10 Alkaline "D" cells @ $1.25 ea. $ 12.50
7 Alkaline "C" cells @ $1.25 ea. 8.75
5 rolls flagging @ $1.10 ea. 5.50

4 days MF-2 Magnetometer Rental
@ $10.00/day 40.00
$ 66.75 66.75

Total This Invoice $ 11,290.34

D. R. Cochrane, P.Eng.

INVOICE

MIN-EN LABORATORIES LTD.
705 WEST 15TH STREET
NORTH VANCOUVER, B.C.
Phone: 980-5814

№ 2933

DATE Feb 14/77

YOUR ORDER NO.

TO Cochrane Consultants,
4882 Delta St.,
Delta, B.C.

Hope Group

OUR ORDER NO.		TERMS	F.O.B.	D. Griffith
4004				

QUANTITY	STOCK NUMBER/DESCRIPTION	UNIT PRICE	AMOUNT
2085	soil geochem - Au	3 50	7297 50
2085	soil sample preparation	35	729 75
	TOTAL		8027 25

PAID
MAR 8 REC'D
77-18

THESE ARE PROFESSIONAL SERVICES AND PAYABEL WHEN RENDERED.

Structural Steel Work
Bolt and Pipe Threading
Shed Builders' Hardware
Portable Welding

RENTALS OF:

Portable
Air Compressors
(85—600 c.f.m.)
Air Tracks
Portable Welders
Drills
Jackhammers
Water Pumps
Sand Blasting Equipment
Bulldozers - Crane Service

M. NUMAN

INVOICE

Telephone 48[illegible]

487-9

NUMAN'S ENTERPRISES LTD.

MACHINE SHOP :: EQUIPMENT RENTALS
BULLDOZING :: ROAD BUILDING :: LOGGING

RR1, Box 9 Powell River, B.C., ...197..

In Account With

AQUARIUS RES. LTD.
c/o Cochrane Consultants
4882 Delta St.

Bulldozed as Required 121 hrs @ $46.00 — $5,566.
Expences as Per Invoices ——— $ 277.
Lowbed Move In ——— $ 675.

$6,518.

Less deductions for Fuel & Repairs — $ 263.

Total $ 6,255.

OK

Nº 1203

5% Prov. Room Tax Incl.

Thank You

NAME ....

ADDRESS ....

CITY .... PROV./STATE ....

SIGNATURE ....

Structural Steel Work
Bolt and Pipe Threading
Sled Builders' Hardware
Portable Welding

RENTALS OF:

Portable
Air Compressors
(85—600 c.f.m.)
Air Tracks
Portable Welders
Drills
Jackhammers
Water Pumps
Sand Blasting Equipment
Bulldozers - Crane Service

M. NUMAN

INVOICE

Telephone 487-9088

NUMAN'S ENTERPRISES LTD.

MACHINE SHOP :: EQUIPMENT RENTALS
BULLDOZING :: ROAD BUILDING :: LOGGING

RR1, Box 9 ~~6162 Lois Street,~~ Powell River, B.C., March 1977

In Account With

Alvarez Resources Ltd

Finished Move Out by
Range Transport — $ 923.50
+ Enclosed meal Invoices — $ 11.85
which were misplaced and not
charged for
Total $ 935.30

No 1204

Thank You,
M. Numan

APPENDIX V1

BIBLIOGRAPHY

Cairnes, C.E. (1924) Memoir 139	Coquihalla Area, B.C. G.S.C.
(1929)	The Serpentine Belt of Coquihalla Region, Yale District, B.C. G.S.C Summary Report 1929 - A
McTaggart, K.C. (1970)	Tectonic History of the Northern Cascades Mountains, in J.O. Wheeler, (ed.) Structure of the Southern Canadian Cordillera; G.A.C. Sp. Paper 6 - pp 137-148
Montgomery, J.H. (1974)	Petrographic Report on Diamond Drill Core from Idaho Zones: Private Report for Carolin Mines Ltd.
Monger, J.W.H. (1969)	Hope Sheet, (west half) G.S.C. Paper 69 - 47

B.C. Dept. of Mines Index # 3, Table 1, Recorded Lode Metal Production.

B.C. Minister of Mines Reports
a) 1928
b) 1929
c) 1930
c) 1937

APPENDIX VII

Conversion Tables

A. Length

Metric	Centimeters	Meters	Inches	Feet	Miles
1 Angstrom	10^{-8}	10^{-10}	3.9370×10^{-9}	3.2808×10^{-10}	—
1 millimicron	10^{-7}	10^{-9}	3.9370×10^{-8}	3.2808×10^{-9}	—
1 micron	10^{-4}	10^{-6}	3.9370×10^{-5}	3.2808×10^{-6}	—
1 millimeter	0.1	0.001	0.03937	3.2808×10^{-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
English					
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	Grams	Kilograms	Oz. Troy	Lb. Avoirdupois	Short Tons
1 milligram	0.001	10^{-6}	3.215×10^{-5}	2.205×10^{-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
Troy					
1 grain*	0.064799	6.480×10^{-5}	0.0020833	1/7000	7.134×10^{-8}
1 pennyweight (24 grains)	1.55517	0.001555	0.05	.00342857	1.71426×10^{-6}
1 ounce (20 dwt.)	31.10348	0.0311035	1	0.0685714	3.4286×10^{-5}
1 pound	373.24	0.37324	12	0.8228569	0.000411428

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

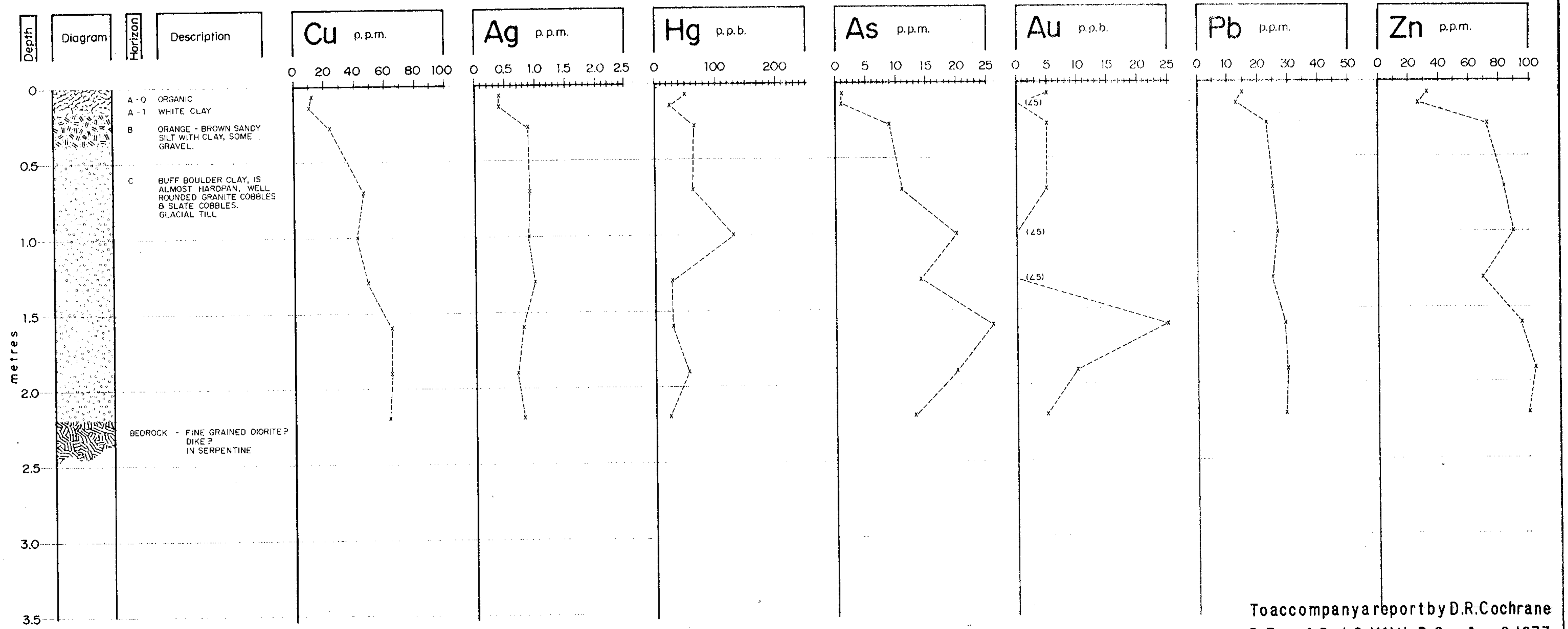
C. Assay Values

	Per Cent	*Grams per Metric Ton	Oz. Troy per Short Ton
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)

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



To accompany a report by D.R.Cochrane P.Eng, & D.J.Griffith, B.Sc, Apr.8,1977

6236 M-1

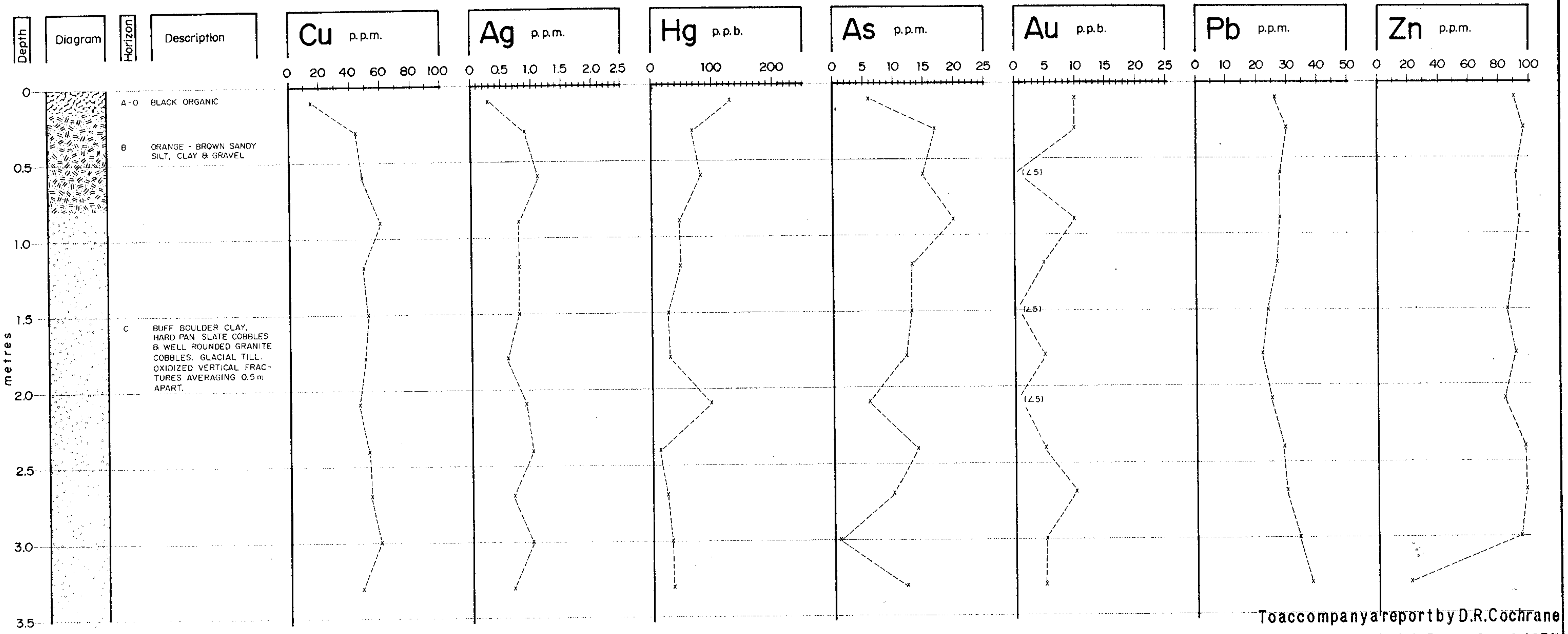
AQUARIUS RESOURCES LTD.
Hope Group Project
British Columbia
New Westminster M.D.
N.T.S. 92 H/6 & 11 W.

SOIL GEOCHEMISTRY PROFILE SITE Nº 1

GEOCHEMICAL SCALE AS INDICATED
SOIL MAPPED BY ... DECEMBER 1976.
DRAWN B.A.C., JANUARY 1977
REVISED
Cochrane Consultants Limited Delta B.C.

Location: Line 39.25 S., 1.0 W.

Figure 15



To accompany a report by D.R.Cochrane P.Eng, & D.J.Griffith, B.Sc, Apr.8,1977

6236 M-2

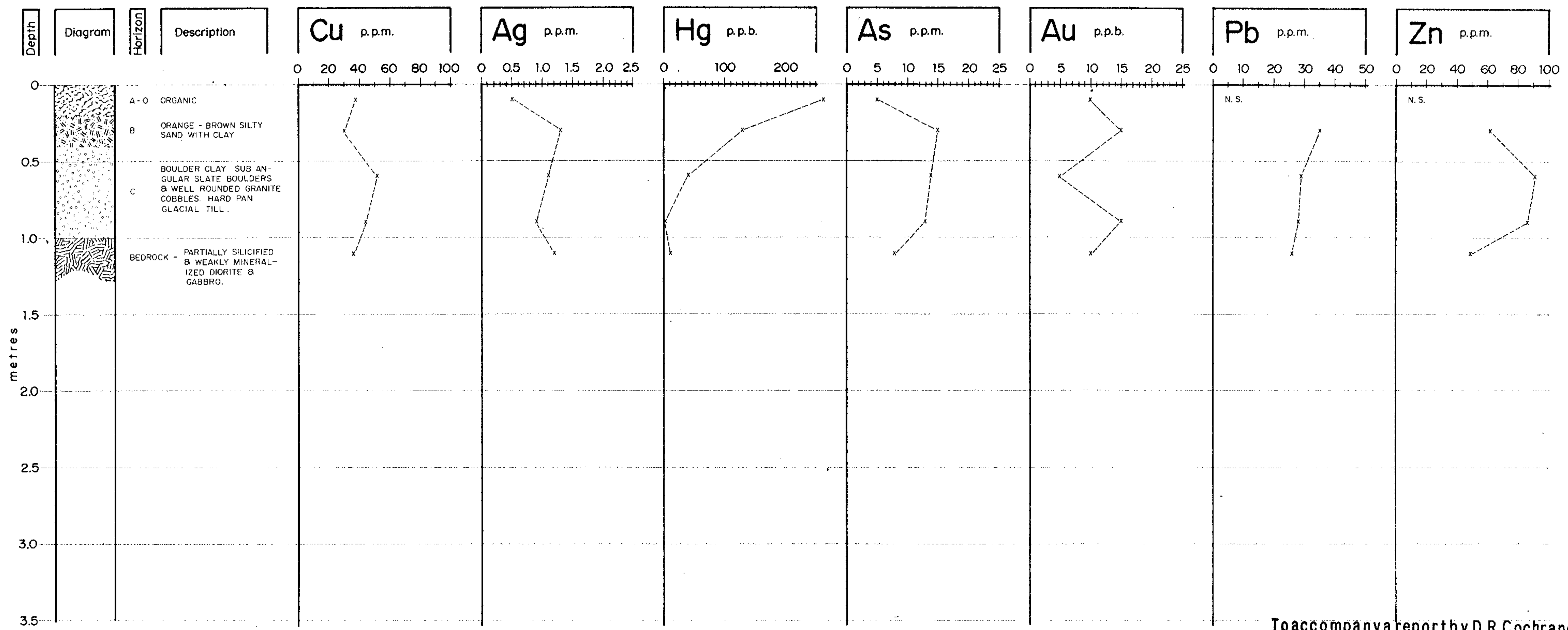
AQUARIUS RESOURCES LTD.
Hope Group Project
British Columbia
New Westminster M.D.
N.T.S. 92H/6 & 11W.

SOIL GEOCHEMISTRY PROFILE SITE № 2

GEOMETRIC SCALE 1:20
GEOCHEMICAL SCALE AS INDICATED
SOIL MAPPED BY D.J.G., DECEMBER 1976.
DRAWN B.A.C., JANUARY 1977.
REVISED:
Cochrane Consultants Limited Delta B.C.

Location: Line 38S., 3.5E.

Figure 16



6236 M-3

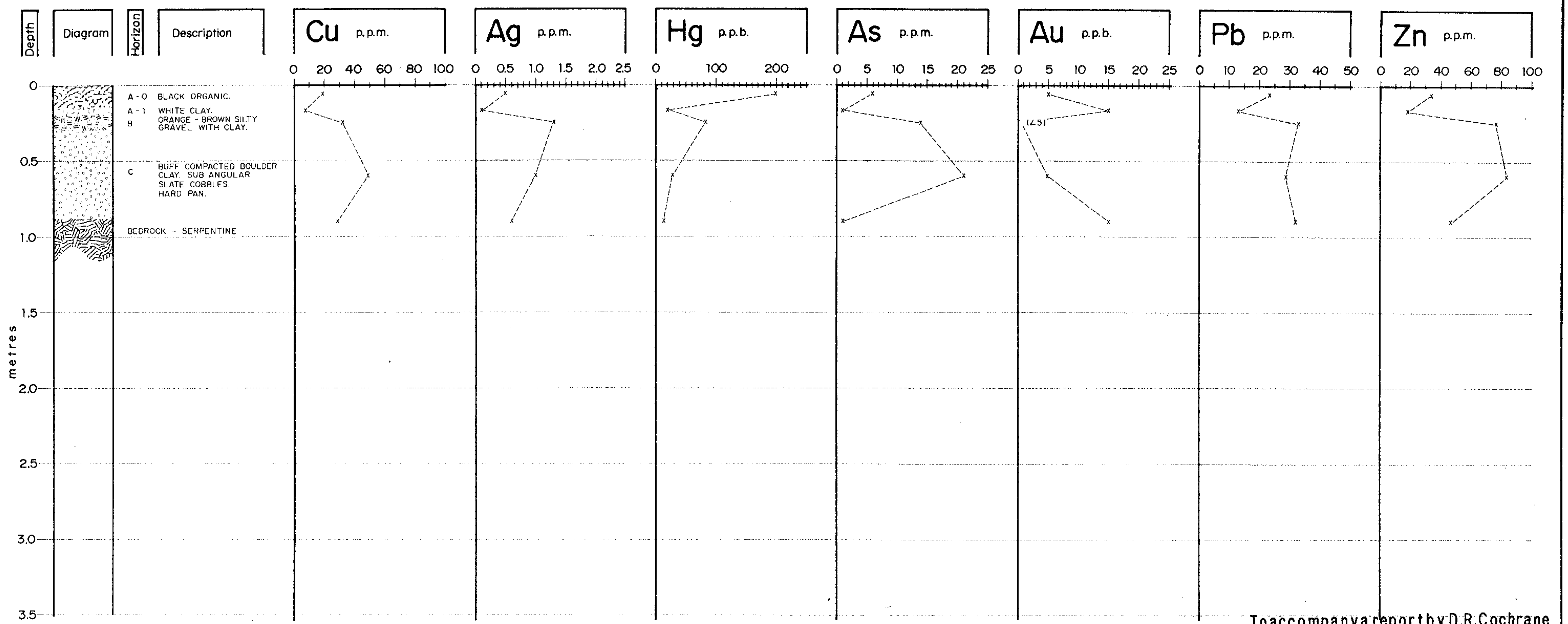
To accompany a report by D.R.Cochrane P.Eng, & D.J.Griffith, B.Sc, Apr.8,1977

AQUARIUS RESOURCES LTD.
Hope Group Project
British Columbia
New Westminster M.D.
N.T.S. 92 H/6 & 11 W.

SOIL GEOCHEMISTRY PROFILE SITE № 3

GEOMETRIC SCALE 1:20
SOIL MAPPED BY D.J.G., DECEMBER 1976.
REVISED:
GEOCHEMICAL SCALE AS INDICATED
DRAWN B.A.C., JANUARY 1977
Cochrane Consultants Limited Delta B.C.

Location: Line 43.9 S., 3.2 E.
Figure 17



To accompany a report by D.R.Cochrane P.Eng, & D.J.Griffith,B.Sc, Apr.8,1977

6236 M-4

AQUARIUS RESOURCES LTD.
Hope Group Project — New Westminster M.D.
British Columbia — N.T.S. 92H/6 & 11W.

SOIL GEOCHEMISTRY PROFILE — SITE № 4

GEOMETRIC SCALE 1:20 — GEOCHEMICAL SCALE AS INDICATED
SOIL MAPPED BY D.J.G., DECEMBER 1976. — DRAWN B.A.C., JANUARY 1977.
REVISED: — Cochrane Consultants Limited Delta B.C.

Location: Line 40.0 S., 1.0 E — Figure 18

To accompany a report by D.R.Cochrane
P.Eng, & D. J.Griffith, B.Sc, Apr.8,1977

To accompany a report by D.R.Cochrane P.Eng, & D.J.Griffith, B.Sc, Apr.8,1977

Legend:

- LINE (CUT & FLAGGED)
- STATION
- CREEK
- ROAD (4 W. D.)
- CAT ROAD
- 500 CONTOUR (TOPO) (FEET A.S.L.)
- + 520' SPOT ELEVATION (FEET A.S.L.)

CONTOUR INTERVAL: $\overline{500}$, $\overline{100}$, 100, 500, 1300, and 2900 gammas.

- $\overline{500}$ & under
- $\overline{500}$ to $\overline{100}$
- $\overline{100}$ to 100
- 100 to 500
- 500 to 1300
- 1300 to 2900
- 2900 & over

AQUARIUS RESOURCES LTD.

Hope Group Project

Coquihalla River / Ladner Creek Area, 92H/6 E.& W.
New Westminster Mining Division, British Columbia.

0 50 100 200 400 FEET

1" = 100' 1 : 1200

0 10 20 30 40 50 60 70 80 90 100 110 120 METRES

Base map traced from enlarged section of 1" = 500' Company map. Contour interval 100 feet. Grid from field notes.
Drawn Feb.'77 by B.A.C.
Revisons:

EMANCIPATION AREA DETAIL FIGURE 21
ISOMAGNETIC PLAN (gammas)

6236 M-7

Cochrane Consultants Limited
4882 Delta Street ——— Delta B.C.

To accompany a report by D.R.Cochrane
P.Eng, & D.J.Griffith, B.Sc, Apr. 8, 1977

To accompany a report by D.R.Cochrane P.Eng, & D.J.Griffith, B.Sc, Apr.8, 1977

AQUARIUS RESOURCES LTD.
Hope Group Project

RECONNAISSANCE AREA
CLAIMS MAP

FIGURE 2C

Coquihalla River - Ladner Creek Area, 92H/6E.&W.
New Westminster Mining Division, British Columbia.

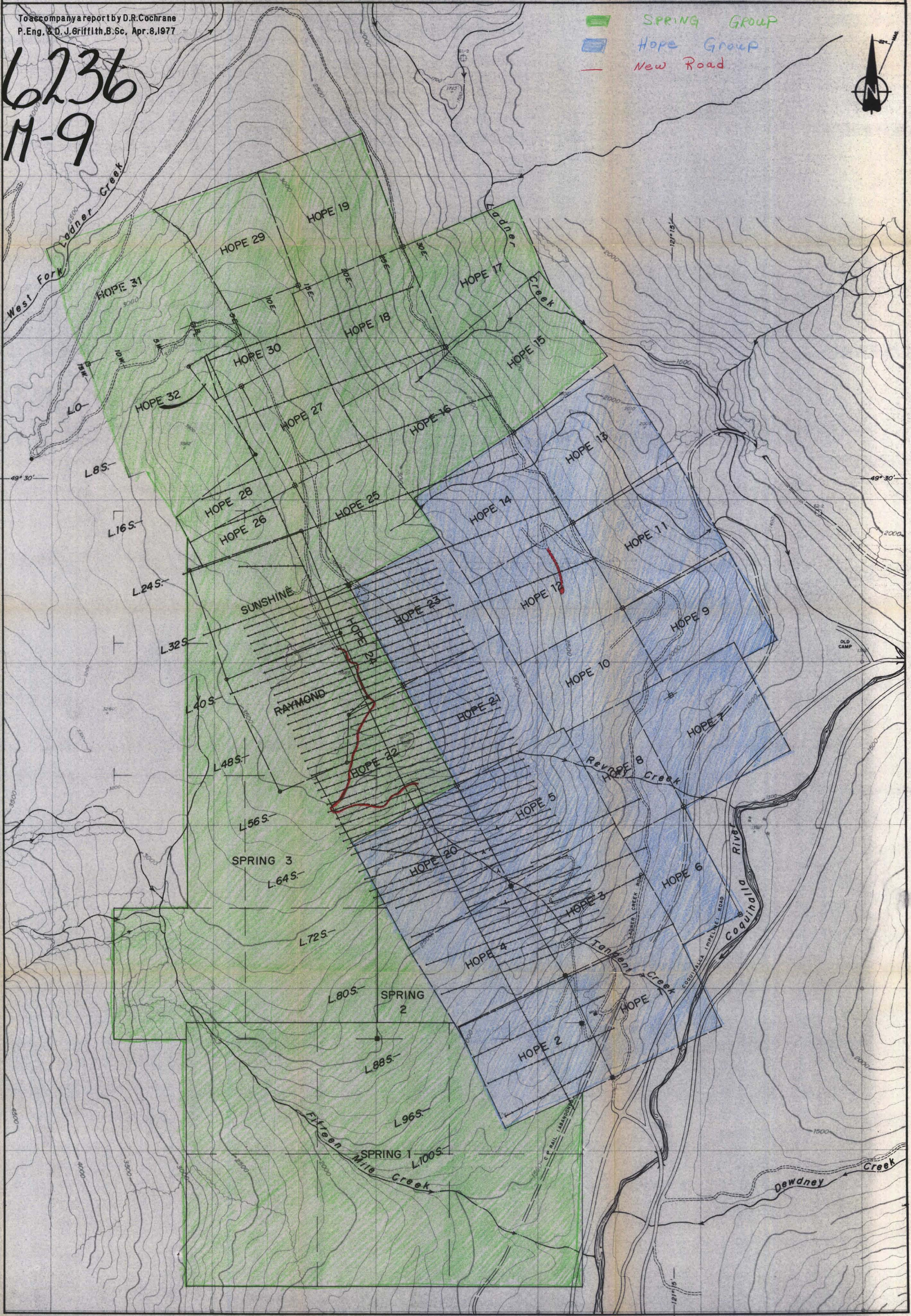
1" = 500'   1:6000

Base Map traced from Burnett Resource Surveys Ltd. Contour Map (Sept.'74) from air photos. March 77, by B.A.C.

Legend:
2 WHEEL DRIVE
4 WHEEL DRIVE
TRAIL
CREEK
ADIT
CAT ROAD
POST (LOCATED, FROM MAPS)
PIN (LOCATED, FROM MAPS)

Overlays:

Cochrane Consultants Limited



AQUARIUS RESOURCES LTD.
Hope Group Project

RECONNAISSANCE AREA FIGURE 24

BEDROCK GEOLOGY

Coquihalla River - Ladner Creek Area, 92H/6 E.&W.
New Westminster Mining Division, British Columbia.

1" = 500' 1:6000

Base Map traced from Burnett Resource Surveys Ltd. Contour Map (Sept. '74) from air photos. March 77, by B.A.C.
Geology Map March 77, by D.J.G

Legend: 2 WHEEL DRIVE; 4 WHEEL DRIVE; TRAIL; CREEK; ADIT; CAT ROAD

Overlays: A. ROADS & DRAINAGE; B. TOPOGRAPHY; D. LINECUTTING; E. GEOLOGY

Cochrane Consultants Limited
4882 Delta Street — Delta B.C.

To accompany a report by D.R.Cochrane P.Eng, & D.J.Griffith, B.Sc, Apr.8,1977

6236
M-10