

WILLIAM M. SHARP, M.A.SC., P.ENG. CONSULTING GEOLOGICAL ENGINEER 171 W. ESPLANADE, NORTH VANCOUVER, B.C.

March 25, 1975.

British Columbia Securities Commission, Bank of British Columbia Building, 756 Fort Street, Victoria, B.C.

RE: GEOLOGICAL REPORT, HO & IN CLAIM GROUPS, POWELL RIVER AREA, B.C., VANCOUVER MINING DIVISION FOR NEWVAN RESOURCES LTD. (N.P.L.)

Gentlemen:

The undersigned hereby gives his consent to the use of the full report, or his summary, by Newvan Resources Ltd. (N.P.L.) for the purpose of providing public information concerning the property, recommendations and cost estimates relating to its exploration.

Yours truly,

W.M. Sharp, P.Eng.

WILLIAM M. SHARP, M.A.SC., P.ENG. CONSULTING GEOLOGICAL ENGINEER 171 W. ESPLANADE, NORTH VANCOUVER, B.C.

March 25, 1975.

President & Directors, Newvan Resources Ltd. (N.P.L.) c/o 3579 - 224th Street, Langley, B.C.

Attention: Mr. C.M. Beamer, President

Dear Sir:

Pursuant to discussions with your associates and the formal authorization consequently received, the undersigned has prepared the accompanying "Geological Report on the Ho & In Claim Groups, Powell River Area, B.C., Vancouver Mining Division".

The report is based on the writer's own examina-

tions, general local experience, and on maps and other data made available by your associates. It is hereby respectfully submitted.

Yours truly,

My m. Marp

W.M. Sharp, P.Eng.

enclosure

GEOLOGICAL REPORT

on the

HO & IN CLAIM GROUPS

in the

LEWIS LAKE SECTION

of the

POWELL RIVER AREA, B.C.

(N.T.S. MAP AREA 92F/16W)

VANCOUVER MINING DIVISION

for

NEWVAN RESOURCES LTD. (N.P.L.)

VANCOUVER, B.C.

by

W.M. Sharp, M.A.Sc., P.Eng., North Vancouver, B.C.

March 25, 1975

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SUMMARY & CONCLUSIONS

The Lewis Lake property of Newvan Resources Ltd. comprises 20 contiguous full-sized claims. These cover a 2.8 mile length of the easterly part of a well indicated, northwesterly-trending zone of Cu/Mo sulphide mineralization. Situated 10 air miles northeast of Powell River, the Ho-In claim group is accessible from Highway 101 via 16 miles of main-haul logging road plus about 4 miles of branch road.

A small area within the north half of the property has been well prospected and superficially explored by a previous exploration group via hand trenching and test pitting. The follow-up grab and chipsampling of the several small exposures disclosed mineralization grading between 0.05% and 0.2% copper, and with a straight-average copper content of about 0.12%.

The Ho-In claim block, like the general Lewis Lake area, is underlain principally by granodiorite, quartz diorites and monzonites of the regional Coast Plutonic Complex. Within the area of the showings associated pyrite and chalcopyrite occur, as disseminations and fracture fillings, in fresh to only slightly chloritized hornblende/biotite granodiorite. This has been traced, via a dozen or more separate bedrock showings, over an approximate 1800' x 300' area comprising less than 2% of the area of the claim block.

A well developed soil horizon generally occurs over a layer of mixed glacial drift which is seldom over 15[†] thick. From the foregoing it is apparent that both surface and sub-surface conditions are near optimum for exploration by means of standard geochemical and geophysical (I.P.) methods.

A general 1/4 by 1/2 mile area of similarly mineralized showings abuts the southerly section of the property. The recorded (1970) copper assays relating to about 20 separate exposures range from 0.06 - 0.61%, and (arith.) average about 0.2%. Further north, at 700' and 1100' west of the Newvan claim block, two areas of bedrock have been exposed. Within these, good but erratically dispersed chalcopyrite, bornite, and some molybdenite occur in a quartz-flooded biotite granodiorite. The one random chip sample taken by the writer, over a 50-foot gross width of this mineralization, assayed 0.02 oz./Ton Ag, 0.30% Cu.

None of the above mineralized zones, either inside or outside of the claim block, have been explored in more than a preliminary fashion. Within the property, at least, no mineralization of oregrade has been exposed. However, substantial areas of low-grade, disseminated copper mineralization are indicated by the existing series of showings. As these situate within a geological setting that is favourable for the occurrence of "porphyry-type" deposits, the writer considers that the property has sufficient potential to warrant the exploration hereby recommended.

RECOMMENDATIONS

PHASE I

- Prepare survey grid, using the Ho group base-line and cross-lines @ 400' spacing; stations @ 100' intervals.
- 2. Carry out geochemical soil sample survey over the N.W. S.E. extent of the claims, where feasible.
- 3. Carry out geological mapping of observed (It.2) bedrock.
- 4. Carry out induced polarization surveys on "reconnaissance" and "detail" line spacing.
- 5. Trench or percussion drill indicated mineralized zones.
- <u>PHASE II</u> open re possible trenching and diamond drilling, contingent on Phase I results.

ESTIMATED COSTS

1.	Base-line and X-lines, 14 mi. @ \$150/mi	•	•	•	\$ 2,100
2.	Collection and Cu analyses, 600 samples @ \$4.00 each	•	•	•	2,400
3.	Estim. 2 field days) incl. fees and all related " l office ") expenses	•	•	•	500
4.(a (ł	a) Reconnaissance I.P., 6 mi. b) Detail I.P. , <u>4 mi</u> . 10 mi. @ \$600/mi	•	•	•	6,000
5.(a (ł	a) Access trail preparation	•	•	•	1,000 5,000
6.(a (1 (0	a) Field engineering and supervision		•	•	 1,500 1,000 2,000
	TOTAL PHASE I .	•	•	•	\$ 21,500

PHASE II - open

Respectfully submitted,

mm. Sharp

W.M. Sharp, P.Eng.

INTRODUCTION

During one of a number of reconnaissance examinations, made in the 92F/16W map area during 1971, the writer inspected the more easily accessible bedrock exposures west of Lewis Lake. This included an inspection of some of the showings now covered by Newvan Resources! Ho claim group.

During November, 1974, the writer examined and sampled key exposures on the westerly-adjoining claim group - specifically comprising the "Spring", "E-Grade" and "W-Grade" showings.

In early March, 1975 the writer was requested by Newvan Resources, Ltd., via a letter of authorization, to prepare a formal report on the property comprising Ho 1-10 and In 1-10, inclusive. Completion of this assignment was made possible through the provision of certain supplementary reference maps and general data which the client had obtained from Mrs. M.V. Boylan and R.E. Mickle of Powell River.

PROPERTY

(a) Location & Access

The property situates at about 70 straight-line miles northwest of Vancouver and 10 line-miles northeast of Powell River. Locally, it centers at about the southwest corner of Lewis Lake, and extends southeast and northwest of this point. The known bedrock showings, comprising the "North Copper Zone", locate at about 1/2 mile west of Lewis Lake, and between 1400 and 1500 feet above sea level.



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From Lang Bay, on Highway 101 at about 13 miles southeast of Powell River, the property and showings are accessible by way of about 16 miles of well maintained main-haul logging road, and approximately 4 miles of quite passable secondary roads.

During the normal may - October "dry" season, all local roads are passable via ordinary light trucks; during the wet or snowy winter months, 4-wheel drive vehicles are generally required.

(b) Claims

The property consists of 20 contiguous, full-sized mining claims. These lie within adjacent "lxl0" and "2x5" adjoining, N.W.-trending rectangular claim blocks; hence the gross dimensions of the composite block is approximately 4500 ft. by 15,000 ft. - the latter dimension being in the N.W. - S.E. direction. Particulars of the constituent claims are as follows:

	Names of Claims	Record Numbers	Record Dates
Ho 1 -	Ho 3, incl.	26392 - 26394, incl.	Nov. 25, 1974
Ho 4 -	Ho 10 incl.	26470 - 26476, incl.	Dec. 2, 1974
In 1 -	In 10 incl.	26445 - 26454, incl.	Dec. 2, 1974

All claims are in the Vancouver Mining Division.

Details of the agreement pertaining to the acquisition of the claims by Newvan Resources Ltd. are available from the Company's principals.

(c) Physical Features

Over the gross surface extent of the property the topography ranges from moderate to moderately rugged. Within the Ho 4-5 area of showings the surface, in general, slopes gently eastward to the shore of Lewis Lake, or to the flat, partly swampy areas which locally border

it.

Over most of claim group bedrock is largely concealed by a relatively thin cover of glacial drift and fluvioglacial deposits. The surfical deposits consist of variable proportions of clay-till, boulders, gravel, sand, and soil; however, their total thickness seldom exceeds 15 feet, and is normally in the range of about 3 to 10 feet. A well developed layer of soil covers most of the area, providing highly suitable conditions for geochemical exploration.

Much of the surface is covered by typically coastal forest growth. However, underbrush tends to be relatively light and only locally does it, or wind-felled timber, significantly impede foot travel.

Temperatures during the wet winter season seldom drop below 20° F; however, much of the total precipitation occurs as snow. The several creeks and ponds throughout the property provide abundant water for all purposes.

The property is very favourably located in respect of the exploration and mining logistics.

HISTORY

Only prospecting and small scale physical exploration by individuals had been carried out within the general Haslam - Dodd Lakes area prior to 1967. In the spring of 1967 Falconbridge Nickel Mines Ltd. optioned the Bruce and Mary V/Tye claim groups, respectively south of Dodd Lake and Lewis Lake, from co-owners J.R. and M.V. Boyland and R.E. Mickle. During the spring and summer of 1967 Falconbridge carried out geologic mapping, soil sampling, and self-potential and E.M.-16 surveys.

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Follow-up work comprised bulldozer excavation, rock trenching and 1,655 feet of diamond drilling via 5 holes in the vicinity of the Mary V showing. On the basis of the rather indifferent results obtained by this localized physical exploration, Falconbridge dropped their option. No induced polarization tests were carried out in spite of the apparent applicability of the method in respect of the disseminated character of the copper sulphide mineralization. By agreement, all exploration data were given to, and became the property of, the optionors.

In late 1970 Caracas Mining Co. Ltd. carried out exploratory trenching on the Mike group, and closely south of the Mary V main showings - with unknown results.

As a result of their general program of soil sampling, Falconbridge delineated a zone of soil copper and molybdenum anomalies along an axis trending northward from the Mary V main showings. The most northerly of these occurred at the north end of the soil sample grid, which happened to terminate at about 1/2 mile south of Lewis Lake. None of these, excepting the one corresponding with the Mary V showings, were explored in any detail. However, in 1970 Asarco obtained an exploration option on at least part of the ground which had reverted to the Boylan - Mickle group. With this, that company explored the more northerly of the above-noted anomalies via a program of mapping testpitting and trenching, and rock sampling. As a result, assays derived from samples taken on the several small granodiorite bedrock exposures, comprising the currently designated East and West Grade showings ranged between 0.04% and 0.61% copper; the arithmetic average grade of about

12 samples was 0.18% copper. These particular showings lie closely southwest of the Ho and In groups.

For reasons unknown to the writer Asarco, like Falconbridge, dropped their option without - at least to the extent of the writer's knowledge - carrying out an I.P. survey.

The few samples (underlined on Dwg. No. N-1), which were taken by the writer, generally substantiate the Asarco data.

Only limited test pitting and rock trenching has been carried out on Newvan Resources' Ho and In claim groups, and this is localized to the Ho 4 and 5 claims. The writer has no knowledge or record as to who carried out this essentially small-scale prospect work.

Currently, an active and interesting exploration program, including I.P. surveying, is in progress in the nearby area extending from the south end of Dodd Lake through Ireland Lake.

GENERAL GEOLOGY

All bedrock underlying the general region in which the Ho and In claims situate, relates to the Coast Plutonic (or Crystalline) complex. Roddick (G.S.C. Memoir 335,1965) postulates, from his studies of a generally similar suite of rocks within the Pitt Lake - Coquitlam -North Vancouver areas, that the plutonic complex is the result of progressive metasomatism and recrystallization of what were originally volcanic and sedimentary rocks. Earlier, Armstrong (G.S.C. Paper 53-28)



had noted that "the general trend of the various facies divisions is roughly parallel with that of the pre-plutonic rocks and ... that they do not appear to represent separate intrusions and ... may not be of igneous or magmatic origin!" Accordingly, contacts between the larger bodies of differing composition tend to be gradational, while sharp contacts occur only at the boundaries of the smaller but more distinctly intrusive rock-types.

Within the Lewis Lake area the main rock-types comprise (gneissic) granodiorite, quartz diorite and (quartz) monzonite; subordinate types, which frequently cut or intrude the above noted bodies or comprise rather local phases of them, consist of granite, feldspar porphyry, andesite, and porphyritic granodiorite. There is some field and photogeological evidence which jointly indicate that occurrences of favourable acidic-siliceous (quartz-flooded) intrusives relate to major faults and breccia zones.

Lineaments observed on aerial photographs of the region were plotted on a suitably-scaled planimetric map, and "fitted" to such coincident linear features as might show on the map. From this a few major and several less apparent, or minor lineaments were deduced respectively indicating the presence of major faults, minor faults, major jointing, dykes, or other "apparent" geological features.

The resulting compilation (Fig. 3) indicates a major fault ("Haslam Lake fault") striking northeasterly through the region from the south end of Haslam Lake. Two other strong "faults" are indicated: one trending northwesterly through Horseshoe and Lewis Lakes - and the Ho and In claims - and one with an east-west strike through a point at

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about one-quarter of a mile north of Horseshoe Lake. Over a dozen other, but less apparent, "breaks" have been plotted. Of these, two strike northeasterly across the Ho and In claims to make apparent intersections with the Horseshoe - Lewis Lake "fault".

In respect of the inferred regional fault pattern, the currently significant intersections are those that appear to exist inside of the Ho and In claim block. Within the suggested structural framework there are excellent possibilities for the occurrence of strongly fractured masses of bedrock within the property. These fractured zones might comprise optimum structural situations for the occurrence of pay concentrations of the relatively widespread, but generally discontinuous copper mineralization.

Typical occurrences of "ore minerals" comprise chalcopyrite plus subordinate amounts of bornite and molybdenite. The copper minerals are usually associated with pyrite. All of the sulphides occur in both the fracture-filling and disseminated or dispersed mode, and occur in all of the principal plutonic rock-types.

Some bedrock exposures contain considerable disseminated pyritė. This usually occurs as rusty-weathering spots in which grains of less oxidized chalcopyrite are sometimes seen. Exploration to date indicates a principal zone of Cu/Mo sulphide mineralization extending northward through, or from, the Mary V showings through the East and West grade showings to, and possibly beyond, the North Copper Zone in the Ho and In claims. However, the exploration which had been accomplished by the fall of 1970 was neither broad enough nor thorough enough for an adequate delineation of the mineralization and assess-

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ment of the ore potential of this particular zone.

Magnetite is a common, minor accessory mineral within the principal plutonic rock types. Also, as revealed by tests with a hand magnet, it occurs in significant amounts with at least some of the mineralization and/or rock types existing at the Mary V main showings.

PROPERTY GEOLOGY & MINERALIZATION

Granodiorite and, locally, quartz diorite comprise the principal rock types underlying the North Copper Zone within the Ho 4 and 5 claims. They contain fairly abundant hornblende but only minor amounts of biotite; also, they usually contain trace, to easily detectable amounts of magnetite. A lighter-coloured intrusive, which is megascopally classified as biotite-quartz monzonite, apparently occurs to a lesser extent. On the basis of the limited amount of evidence available, it appears that the darker facies are better mineralized - possibly due to an apparent affinity of the sulphides and the mafics; the latter are generally more abundant in the more basic rock types.

The local copper mineralization, as chalcopyrite, occurs in both the fracture-filling and disseminated mode. The mineralization, as exposed by frequently occurring outcrops and some test pits, appears to be well diffused; however, individual outcrops tend to contain rather spotty concentrations of the sulphides. Few of the bedrock exposures appear to be altered to any great extent, but most of them are appreciably fractured.

The writer has not personally sampled the North Copper Zone mineralization. However, the reference map provided shows that eight (grab or chip?) samples taken in 1970, and individually assaying between 0.05 and 0.2% Cu, returned an arithmetical average grade of about 0.12% Cu.

The currently explored area of the North Copper Zone amounts to less than 5% of the total area of the claim group. Although none of the mineralization exposed is of ore grade, the exploration so far accomplished by no means rules out the possibility that the mineralization might be more intense at depth or on specific lateral extensions of the exposed mineralization.

Bedrock exposures are rare; however, the few widely separated exposures that have been seen to date indicate that the claims and adjacent areas are underlain by granodiorite, quartz diorite and, locally, granite. This bedrock assemblage, particularly where it has a complex petrology or is substantially fractured, comprises a favourable environment for the occurrence of widely disseminated copper mineralization. On the basis of the appreciably mineralized character of the few existing bedrock exposures occurring on the group and adjacent to it, the writer attributes considerable ore potential to the 95 percent unexplored section of the claim block.

OUTSIDE SHOWINGS

The various showings described in the following text are outside of the Ho - In claim block, but are of particular significance by reason of their proximity to it.

(a) West Grade Showings:

These situate 1800 - 3000 ft. southwest of Ho 7 - 8, and have a north-south extent of about 1500 ft. The chalcopyrite/pyrite mineralization, seen within about a dozen small exposures, occurs in rather massive, speckled, white siliceous biotite/hornblende granodiorite. The exposures were investigated and sampled by unknown persons (Asarco?) in 1970, or earlier. Two of the old (1970) grab or random-chip samples taken assayed 0.30% and 0.16% Cu. Five others averaged out at about 0.12% Cu, and another assayed 0.55% Cu. A random chip sample, taken by the writer (Nov. 1974) across a 6-foot pit exposure of rather typical mineralization assayed 0.11% Cu.

(b) East Grade Showings:

This area of showings abuts or lies immediately west of the southwest side of the Ho 8 claim. It comprises at least 10 separate, localized exposures of typical copper/iron sulphide mineralization within a 1000' by 1500' area. Three old grab or random chip samples assayed 0.10, 0.17 and 0.61(?) percent respectively. The writer's check sample, comprising a 10' linear chip sample of mineralized rather massive, fine-grained, siliceous biotite granodiorite (or quartz monzonite) assayed 0.07% Cu.

Pending a claim survey, it would appear that the two most northerly exposures lie just inside the west corner of Ho 8.

(c) Spring Showings:

These comprise two fairly extensive, but separate exposures respectively lying 700 and 1100 feet west of the Hol claim. Also, to the extent of the writer's knowledge, no systematic exploration has been carried out in the general area of the showings. Within these showings rather erratic but generally good disseminated chalcopyrite and minor bornite, with local clots of molybdenite, occur in quartz-flooded white granodiorite (or granite ?). Pyrite occurs very sparsely; the copper and molybdenum sulphides occur mainly as grains and blebs with the biotite of the host rock, and as heavier disseminations in bunchy or stringer-like aggregates of biotite. The one random chip sample taken by the writer, on a series of separate exposures over a gross length of about 50 feet, assayed 0.02 oz/Ton Ag, 0.30% Cu.

In the writer's opinion, the Spring showings are especially interesting - partly by reason of the degree of quartz flooding occurring in the local bedrock. Also, there is a fair possibility that lateral extensions of this zone may occur within one or more of the Ho claims.

Respectfully submitted,

M.M. Sharp

W.M. Sharp, P.Eng.

ermt.

BIBLIOGRAPHY

- Armstrong, J.E. G.S.E. Paper 53-28, "Vancouver North", 1954.
- Roddick, J.A. G.S.C. Memoir 335, "Vancouver North", Coquitlam and Pitt Lake Map Areas, B.C. 1965.

Sharp, W.M. "Geological Report, Dodd Lake, Cu-Mo Prospects, Powell River area, B.C." May, 1971.

CERTIFICATE

I, WILLIAM M.SHARP, with business and residential addresses in North Vancouver, British Columbia, DO HEREBY CERTIFY THAT:-

- 1. I am a graduate of the University of British Columbia with a M.A.Sc.(1950) degree in Geological Engineering.
- 2. I am a registered Professional Engineer in the Province of British Columbia, Reg. No. 2164.
- 3. I have practiced my profession for 25 years, including 10 years as a geological consultant.
- I personally examined showings on the Lewis Lake properties of Newvan Resources Ltd. during November 17 - 18, 1974.
- 5. This report on the above properties is based on a personal examination of them, and on pertinent government reports and Company maps.
- 6. I have no direct or indirect interest in the property of Newvan Resources Ltd., N.P.L. or of any of its affiliates, nor do I own or expect to own any securities of the Company or its affiliates.

Wm Harp

W.M. Sharp, P.Eng.

North Vancouver, B.C. March 25, 1975.



LEGEND	
GRANODIORITE & QUARTE DIORITE : HORNELENDE > BIOTITE.	
GRANODIORITE , QUARTE MONZONITE, OR GRANITE : BIOTITE > H	ORNBLENDE
FINE-GRAINED DIORITE (LOC. ANDESITE)	in the second branching and the
QUARTZ & STRONG SILICIFICATION	
= GEOLOGIC LINEAMENT (FAULT?) PERFIG.3	
ABBREVIATIONS: CP + CHALCOPYRITE; PY: PYRITE; MO= MOLYEDE.	NITE CONTRACTOR CONTRACTOR STORES
MAP SYMBOLS:	MAPSYMBOLS.
- STREAM	
ROAD OR CAT TRAIL	
++ OLD RAILROAD GRADE (ROAD)	
ASSAYS WIDTH, FT. & AG.OZ/TON; CU, %; MOS, % RE. CONTINUOS-CHIPS	



<u>Cu 0.04</u>



