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171 W. ESPLANADE, NORTH VANCOUVER, B.C.

April 12, 1973

President & Directors,  
Western Standard Silver Mines Ltd. (N.P.L.),  
c/o P.O. Box 462,  
Kelowna, B. C.

Gentlemen:

The accompanying "GEOLOGICAL & GEOCHEMICAL REPORT, AL CLAIM GROUP, NEW WESTMINSTER MINING DIVISION" results from my follow-up surveys of the property made on October 31, November 1-3, 1972 and subsequent office compilations of the resulting geological and geochemical data. The foregoing constitutes acceptable assessment work; hence, the report may be submitted (in duplicate, with 'Form B, Mineral Act') to the Mining Recorder of the New Westminister Mining Division as evidence that work to the amount of at least \$100 per claim has been done on the Company's AL Group prior to the April 22, 1973 anniversary date.

The results of the 1971-72 exploratory work provide evidence of significant Ni-Cu bedrock mineralization within the claim group. This has been sufficiently indicated by geological-geochemical exploration to permit serious consideration of next-stage exploration by geophysical and direct methods.

Department of  
Mines and Petroleum Resources

ASSESSMENT REPORT

NO. 4370 MAP.....

*W. M. Sharp*  
W. M. Sharp, P.Eng.

Atts.

GEOLOGICAL AND GEOCHEMICAL REPORT

AL CLAIM GROUP

located at Cogburn Creek

at

18 air-miles north of Harrison Hot Springs, B.C.

Lat. 49°-33-5'N., Long. 121°-42.6'W

(N.T.S. 92-H-12)

NEW WESTMINSTER MINING DIVISION

by

W. M. Sharp, P.Eng., B.C.

for

WESTERN STANDARD SILVER MINES LTD. (N.P.L.)

KELOWNA, B.C.

between

OCTOBER 30TH AND NOVEMBER 3RD, 1972

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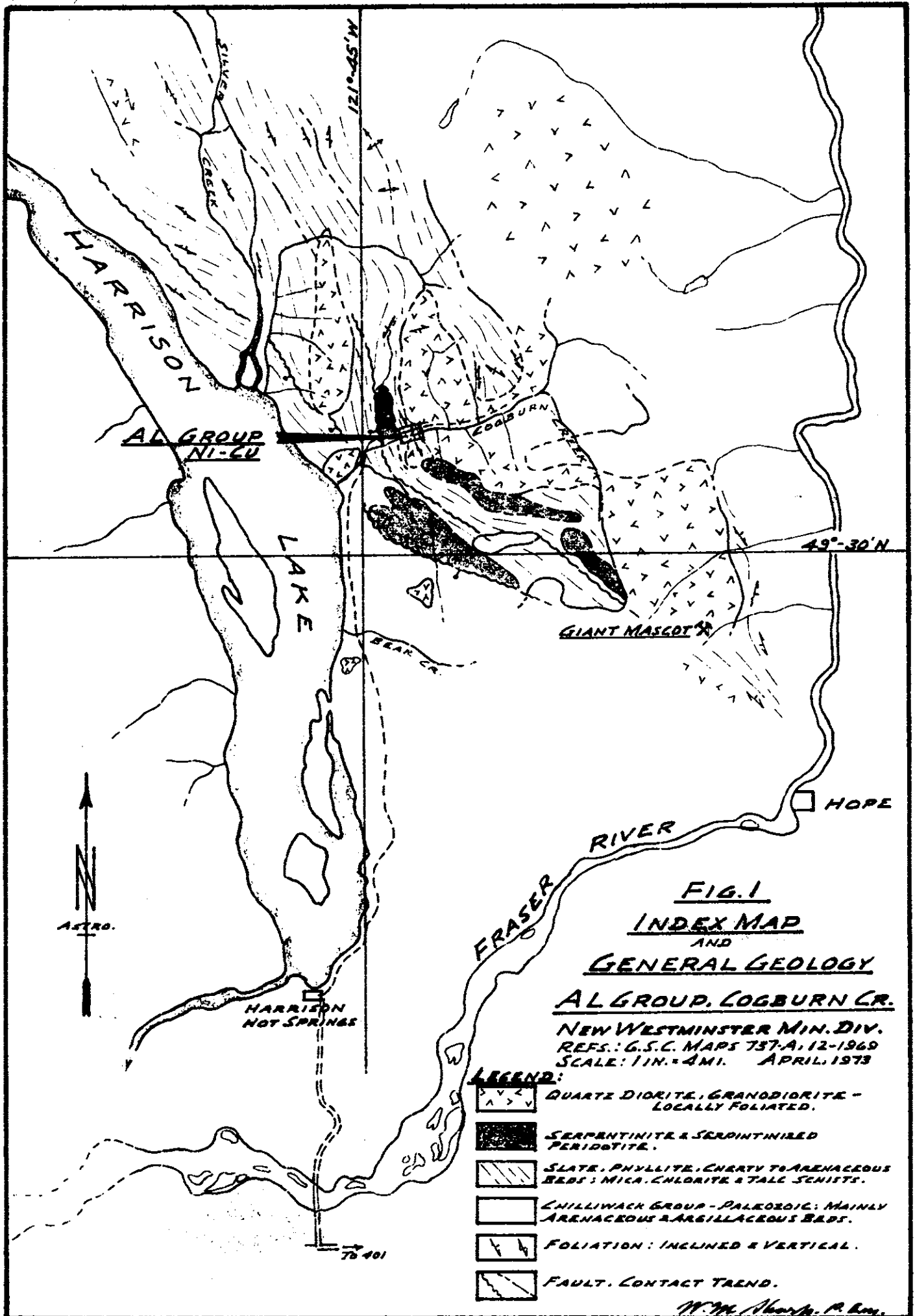
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## INTRODUCTION

Prior to the acquisition of the AL claim group by Western Standard Silver Mines Ltd., the owner-vendor of the property discovered two local occurrences of massive and dispersed iron sulphides, containing appreciable copper and minor nickel mineralization, on AL 3 M.C. in an area closely north of the main access road.

During July, 1971 the writer carried out preliminary geological/geochemical surveys on the claims to the north of Cogburn Creek. These resulted in positive indications of nickel/copper mineralization within AL 3 and adjoining parts of AL 1 and 5. A geological and geochemical report on the above surveys, with the accompanying affidavit (Form B), were submitted to the Mining Recorder of the New Westminster Mining Division.

During the period October 31-November 3, 1972 the writer and assistant extended, with auxiliary air photo control, the 1971 geological/geochemical surveys to up-slope parts of AL 3 M.C. and south of Cogburn Creek via a contour traverse covering most of AL 2, 4, 6 M.C.'s. The results of these, with interpretations relating to both the 1971 and 1972 field work are contained in this report.

## PROPERTY, LOCATION & ACCESS

The AL Group, comprises one 4000' x 3000' block of 6 contiguous claims; record no's of AL 1-6, inclusive, are 23565-23570. B.C. Dept. of Mines records show that all claims

are in good standing until April 22, 1974 - prior to filing the 1972 geological/geochemical work for additional assessment credits.

The claim block straddles Cogburn Creek, which flows westward into Harrison Lake, between 2-3/4-3-1/2 miles from its mouth, and overlies the adjacent steep, partly logged-off, valley slopes. Property elevations range, approximately, between 1200-2000 feet.

Access, from Harrison Hot Springs, is via some 25 miles of narrow, winding, un-paved road along the east side of Harrison Lake to Pretty Timber Company's Bear Creek logging camp; thence via 3-4 miles of logging road crossing, and leading eastward along the north side of Cogburn Creek.

#### PHYSICAL FEATURES OF PROPERTY

Bedrock, outcrops over some 10-15 per cent of the surveyed area. The local overburden varies considerably in composition and thickness. Within the higher parts of the claim group it generally consists of 1-10 feet of mixed sand, clay, and dislodged bedrock fragments; at lower elevations, in both the main valley and tributary creek draws, it consists of up to 100 feet of compact, unsorted to stratified drift and fluvio-glacial material. A layer of well oxidized mineral soil, developed from the afore-noted cover and ranging from a few inches to about 2 feet in thickness, occurs over most of the property surface; therefore, geochemical soil-sampling, for the detection of base-metal mineralization in the underlying bedrock is adaptable to all but the more heavily drift-(clay) covered areas of the property.

FIELD, OFFICE & LABORATORY WORK

Before undertaking the 1972 surveys, a more accurate 1" = 200' base map of the planimetric type was constructed via an expansion of the B.C. Dept. of Lands 1 in. = 1/2 mi. planimetric detail, supplemented and modified by local 1" = 1/2 mi. (approx.) B.C. Government air-photo coverage. The 1971 survey detail was plotted on the new base map, and transferred to a set of 8-1/2" x 11" waterproof field mapping sheets for use on the 1972 surveys.

The 1972 surveys, like those done in 1971, were made via Brunton-tape traverses from points established in 1971 or from identifiable topographic reference points (road and creek detail) contained in the 1" = 200' base map (and field mapping sheets). Traverse stations were marked by flagging. Soil samples were taken at, or near each station and geological detail-including outcrop delineations, rock types, structures, and alteration-was mapped at and between stations. Other detail, such as claim posts and subordinate creeks, were plotted as encountered.

Soil-samples were taken only where suitable material was obtainable. The sampling was done with a standard soil-sampling mattock, taking B-zone material or its closest equivalent - the B-soil horizon usually occurring within a range of 4"-18" below the relatively more organic surface (A) soil layer. All samples were packaged in standard high wet-strength kraft paper bags, and the corresponding traverse station number marked on each bag.

All soil samples were sent to the North Vancouver laboratory of Bondar-Clegg & Company Ltd. for preparation and analysis for total soil-copper and nickel, as follows:

Samples were dried in infra-red ovens on contamination-free aluminum shells, and then screened through an 80-mesh stainless steel sieve with only the natural under-size fraction being kept for analysis. Next, standard (weight) portions of each sample were digested in hot HNO<sub>3</sub>-HCl acid. The resulting solution was 'bulked' to 20% total acid, then analyzed by atomic absorption - this controlled by comparison with 'matrix' and synthetic standards. Results were reported as parts per million (ppm) total copper and nickel.

The geological and geochemical data are plotted on Dwg. No C-1 and C-2, respectively. On the latter, composite nickel/copper anomalous areas are shown in orange.

#### GENERAL GEOLOGY

The Cogburn Creek section (Fig. 1) of the Hope map area is underlain by the Carboniferous-Permian age rocks of the Chilliwack Group - comprising a mixed assemblage of widely altered argillaceous, arenaceous, and limy sediments. A distinguishing feature of this belt of rocks is the degree of folding, intraformational shearing, faulting, and complex intrusion of igneous rocks to which it has been subjected. With this, an attendant regional metamorphism and superimposed local alterations have converted the original rocks to slate, phyllite, feldspathic quartzite, recrystallized limestone and mica, chlorite, and talc schists.

The regional trend of bedding and foliation, which are broadly concordant, is northwesterly-to northerly-to northwesterly; dips are near-vertical to the northeast and southwest.



The above-noted belt of metasedimentary-metavolcanic rocks is extensively and complexly intruded by large masses of quartz diorite, diorite and smaller, often lensy and formationally-controlled intrusions of mafic-to-ultramafic rocks. The regional Ni-Cu mineralization is associated with the latter suite of rocks.

On an economic geological basis, the most significant geological fact is that the belt of metamorphic rocks and intrusives containing the Giant Mascot orebodies traverses the lower Cogburn Area, of which the AL group is a part.

#### LOCAL GEOLOGY

Within the AL group the principal lithologic units (Dwg. No. C-1) exposed at and north of the main road are, from northeast to southwest: massive to gneissic diorite and quartz diorite with minor to major amounts of hornblende/dark pyroxene; foliated quartz diorite and quartz-feldspar-hornblende gneiss; and a mixed assemblage of quartz/feldspar/hornblende gneiss and schist, and chloritic to micaceous to talcose schists containing some shaly, less altered argillaceous, sandy, or tuffaceous sections. Bedding and foliation are generally conformable and have an average strike and dip of about N30°W and 75°N.E., respectively.

Rocks exposed along the line of the long traverse south of Cogburn Creek are darker, have more coarsely crystalline textures, and contain well above average proportions of dark amphibole and pyroxene. The writer received the impression that the local section represents the general contact zone of at least a moderately extensive basic or ultrabasic intrusive body or complex.

The known exposures of Fe-Cu-Ni sulphide mineralization near the southeast corner of AL 3 M.C. occur within a panel of foliated quartz diorites; more locally, they occur within and adjacent to mafic-rich bands or lenses which have been fractured and silicified. Chalcopyrite and sparser pentlandite occur as dispersed grains and clots in relatively massive pyrite/pyrrhotite. Assay results on two chip samples of this mineralization are

Sample No. 24303 - Cu, 0.28%; Ni; 0.01%

" " 24304 - Cu, 1.10%; Ni; 0.01%

The relative proportions of Cu and Ni in the above samples are not in accordance with those that are indicated by the geochemical ratios. However, the presently limited knowledge of local mineral relationships precludes any immediate explanations for this apparent discrepancy.

#### GEOCHEMICAL SURVEY RESULTS

Dwg. No. C-2 supplements the following text.

A total of 91 soil samples has been taken to date. However, as these effectively cover one-half or less of the claim block, and more than half of the total number of samples taken derive from an area in which soil Ni/Cu concentrations appear to be significantly above the regional average, the data do not yet warrant a statistical analysis. This conclusion is made rather obvious by the absence of any significant pattern of sample distribution as evidenced by trial Ni and Cu histograms constructed by the writer. Consequently, a visual appraisal of the data is currently more applicable than a statistical treatment. This suggests that

the average approximate background values for Ni and Cu are 50 ppm and 40 ppm, respectively; similarly, threshold values for soil-Ni and Cu are about 150 ppm and 100 ppm, respectively. Concentrations above this level are interpreted as being anomalous. For present purposes, areas within which Ni and/or Cu concentrations are at, or above the threshold values are interpreted as (compositely) anomalous.

A series of broad to narrow Ni/Cu anomalies traverse the claim block in a N.N.W. direction - generally parallel to the average formational trend. The more significant anomalies and, consequently the area of potential economic Ni/Cu mineralization, situate over the panel of mixed meta-sediments, metavolcanics, and satellite intrusives lying west of the main quartz diorite/diorite body and north of an indicated mass or complex of basic to ultrabasic intrusive rocks. Within the two westerly and principal anomalies 31 soil samples have Cu and Ni values which range between 150-690 and 100-131 ppm, respectively, with an average composite Ni/Cu value computed at 238/75 ppm, or approximately 4.8 and 1.9 times the respective Ni and Cu average background values.

#### CONCLUSIONS

The delineated geochemical Ni/Cu soil anomalies may reflect the presence of such mineralization in the underlying bedrock. Excepting the Fe-Cu-(Ni) sulphide exposures within the southeasterly corner of AL 3 M.C. there is very little direct evidence of such mineralization; hence the

real reason for the anomalies is still obscure. The fact that there is no apparent change of soil-Ni values along the slope-extent of the anomalies tends to discount the possibility that they are simply drainage-related concentrations derived from an outside bedrock source. Soil-Cu concentrations tend to increase in the down-slope direction; however, the apparent increase is too slight to comprise positive evidence of a drainage-related origin for the anomalies.

In view of the favourability of the general and local geological environment for the occurrence of bedrock Ni-Cu mineralization and the geochemical evidence of it, a geophysical investigation of the main target areas is fully warranted. The apparent nature of the local mineralization is such that magnetometer-Induced Polarization coverage might be most effective for this purpose.

Respectfully submitted,

  
W. M. Sharp, P.Eng.

North Vancouver, B. C.  
April 12, 1973

APPENDIX

CANADA  
PROVINCE OF  
BRITISH COLUMBIA

TO WIT:

**In the Matter of** Geological and geochemical field exploration done on the AL claim group (rec.no's 23565D-23570D incl.,) New Westminster Mining Division for Western Standard Silver Mines Ltd. (N.P.L.) between October 30th and November 3rd, 1972 and subsequent map and report preparation to April 14, 1973.

**J.** William M. Sharp, P.Eng., B.C.  
of 171 West Esplanade Avenue, North Vancouver,  
in the Province of British Columbia

do solemnly declare that the following is an accurate estimate of time and costs involved in the above-noted field exploration and relevant office engineering work:

<b>Consultant Fees, W. M. Sharp, P.Eng.:</b>		
Field, 3 days @ \$125.00	\$375.00	
Office, 5-1/8 days @ \$75.00	<u>384.38</u>	\$ 759.38
<b>Wages:</b>		
S. Fegan, 980 Bute Street, Vancouver, B.C.		
Field assistant Oct. 31-Nov. 3, 1972		
2-1/2 days @ \$40.00	\$100.00	
1 day @ \$30.00	<u>30.00</u>	130.00
<b>Direct Expense:</b>		
L.d. phone to Pretty Timber Co. camp	\$ 1.50	
Travel, meals, Sharp & Fegan	2.40	
Board & lodging, Pretty Timber camp for 2 days for Sharp & Fegan	40.00	
Car operating allowance 300 mi. @ 0.10	30.00	
3 rolls of flagging @ \$1.00 ea.	3.00	
Geochemical sample prep. and Ni/Cu analyses of 47 samples per Bondar-Clegg Invoice #8025	79.90	
Report steno	14.00	
Prints, report maps (estim.)	2.50	
Photocopy, report materials, and mailing charges (estim.)	2.50	
Notary charge re Stat. Declaration	<u>2.00</u>	<u>177.80</u>
<b>Total:</b>		<u><u>\$1,067.18</u></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 *city of*  
*North Vancouver* in the  
Province of British Columbia, this  
*16<sup>th</sup>* day of *April*  
A. D., 19 *73*

*W. M. Sharp*

A Notary Public in and for the Province of British Columbia  
A Commissioner for taking affidavits within British Columbia.

THOMAS FRANCIS FITZ-GIBBON

A Commissioner for taking Affidavits  
for British Columbia



BONDAR-CLEGG & COMPANY LTD.

geologists • geochemists • analysts

1500 PEMBERTON AVENUE, NORTH VANCOUVER, B.C.  
PHONE 988-5315

**GEOCHEMICAL LAB REPORT**

No. 22-702

Extraction Hot Aqua Regia  
Method Atomic Absorption  
Fraction Used -80 mesh

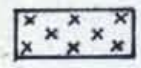
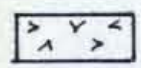





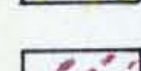
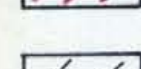
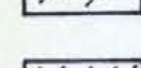
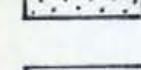
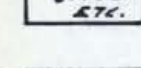
From Mr. W. M. Sharp  
Date November 7, 1972 19  
Analyst K. B.

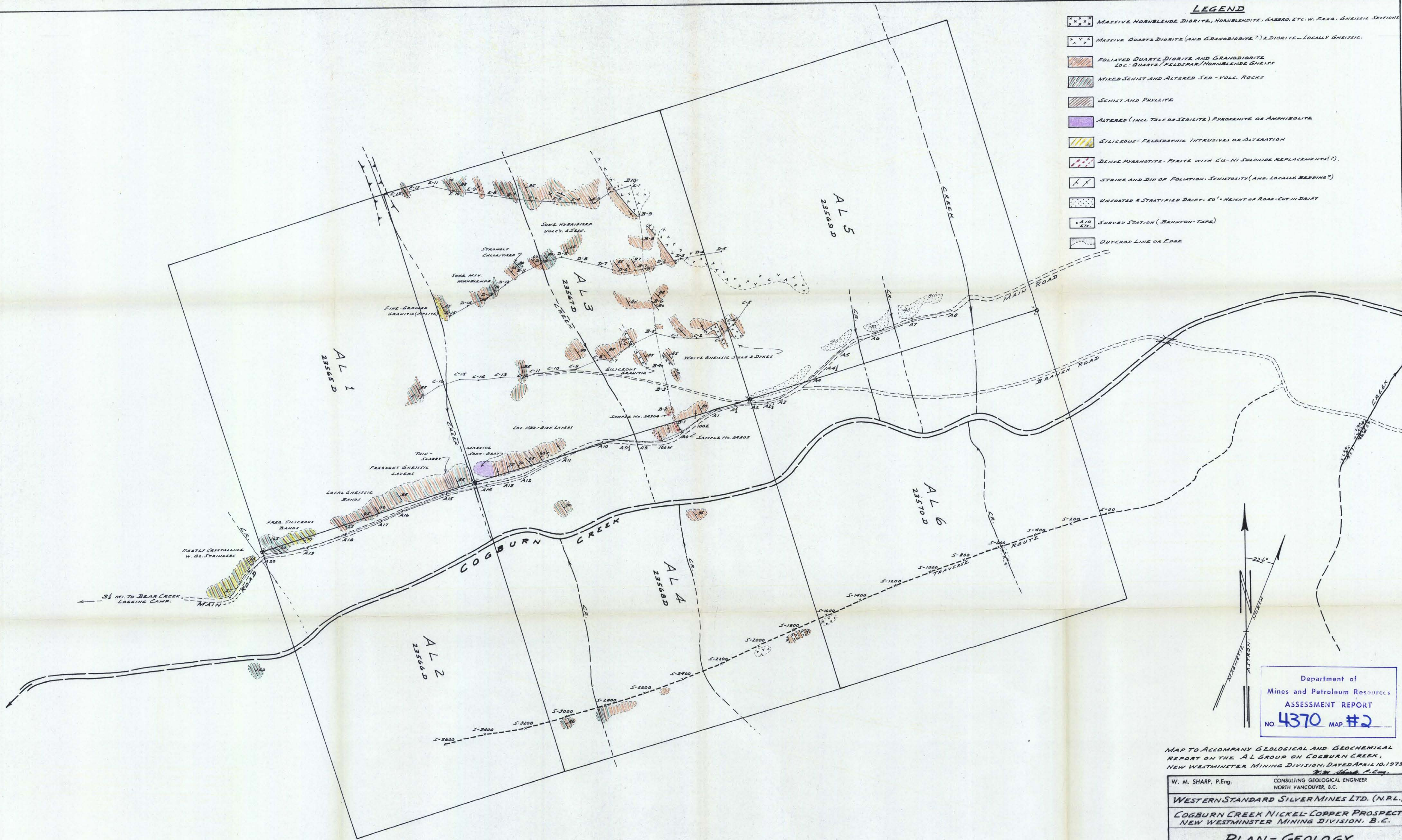
SAMPLE NO.	Cu ppm	Ni ppm					REMARKS
S - 000	24	145					
200	44	139					
400	56	156					
600	52	118					
800	59	160					
1000	71	178					
1200	46	82					
1400	94	165					
1600	23	33					
1800	36	33					
2000	65	44					
2200	49	220					
2400	52	180					
2600	36	108					
2800	119	160					
3000	27	62					
3200	75	268					
3400	47	288					
S - 3600	67	129					
D - 1	68	238					
2	73	138					
3	37	90					
4	106	276					
5	51	118					
6	31	60					
7	24	47					
8	37	165					
9	44	690					
10	59	135					
D - 11	57	157					





**LEGEND**

-  MASSIVE HORNBLENDE DIORITE, HORNBLENDE, GABBRO, ETC. W. F.R.R. GNEISSIC SECTIONS
-  MASSIVE QUARTZ DIORITE (AND GRANDIORITY?) & DIORITE - LOCALLY GNEISSIC.
-  FOLIATED QUARTZ DIORITE AND GRANDIORITY  
Loc.: QUARTZ/FELDSPAR/HORNBLENDE GNEISS
-  MIXED SCHIST AND ALTERED SED-VOLC. ROCKS
-  SCHIST AND PHYLLITE
-  ALTERED (INCL. TALE OR SERICITE) PYROXENITE OR AMPHIBOLITE
-  SILICEOUS-FELDSPATHIC INTRUSIVES OR ALTERATION
-  DENSE PYRRHOTITE-PIRITITE WITH CU-NI SULPHIDE REPLACEMENTS(?)
-  STRIKE AND DIP OF FOLIATION, SCHISTOSITY (AND, LOCALLY, BEDDING?)
-  UNSORTED & STRATIFIED DRIFT: 50' HEIGHT OF ROAD-CUT IN DRIFT
-  SURVEY STATION (BRUNTON-TAPE)
-  OUTCROP LINE OR EDGE



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 4370 MAP #2

MAP TO ACCOMPANY GEOLOGICAL AND GEOCHEMICAL  
REPORT ON THE AL GROUP ON COGBURN CREEK,  
NEW WESTMINSTER MINING DIVISION, DATED APRIL 10, 1973.  
W. M. SHARP, P. Eng.

W. M. SHARP, P. Eng.	CONSULTING GEOLOGICAL ENGINEER NORTH VANCOUVER, B.C.
WESTERN STANDARD SILVER MINES LTD. (N.P.L.)	
COGBURN CREEK NICKEL-COPPER PROSPECT NEW WESTMINSTER MINING DIVISION, B.C.	
<b>PLAN - GEOLOGY</b>	
FIELDWORK: OCT. 31 - NOV. 3/72 REF. DWS No. 1, AUG. 2, 1971	
Scale: 1 IN. = 200 FT.	Date: APRIL 10, 1973
Dwn. by: W. M. SHARP, P. Eng. Revision:	Dwg. No. C-1



