

GEOLOGICAL SURVEY REPORT
BUTTLE LAKE PROPERTY - VALLEY COPPER MINES LTD. - KAMLOOPS M.D.

(NE QUADRANT 50°, 122°)

The 76 claims comprising the Buttle Lake property are located six miles southwest of Bethlehem Copper Mines Ltd. (Lat. 50°, 35' N, Long. 122° W) in Highland Valley. The claims have been divided into two groups, Valley Copper 12 and 13, and the claims on which the work was done and the amount of credit requested is shown on the following lists:

<u>Claim</u>	<u>Record No.</u>	<u>Requested Credit</u>	<u>Total</u>
<u>Valley Copper Group 12</u>			
Nancy 2, 3, 4	15385, 86, 87	1 year each	3 yrs.
" 11, 13, 14	16922, 16924-25	1 " "	3 "
Stewart 1 Fr., 2 Fr.	24213, 24211	1 " "	2 "
Tom 1-6, 13, 14, 16-18	41772-77, 41784, 85, 41787-89	3 " "	33 "
Tom 7-12, 15	41778-83, 41786	2 " "	14 "
BL 1 Fr., 1-3, 12-17	41790, 41791-41793, 41802-07	4 " "	40 "
BL 2 Fr.	45370	4 " "	4 "
BL 37	41827	3 " "	3 "
Kathleen	L 5632	Grown grant	—
		Total:	102 "
<u>Valley Copper Group 13</u>			
Empire	30183	4 year each	4 "
Stewart 3 Fr.	24212	1 " "	1 "
Nancy 5, 6	15388, 15389	1 " "	2 "
BL 22-25, 30-33, 35, 36 40-43	41812-15, 41820-23 41825, 41826, 41830-33	3 " "	42 "
BL 34, 10, 11, 18-21, 4, 5,	41824, 41800, 41801, 41808-41811, 41794, 41795	4 " "	36 "
BL 6-9, 26-29, 44, 45	41796-99, 41816-19, 41834, 41835		
		Total:	85 "
	OVERALL TOTAL:		187 years

Work was carried out during the period August 5 to October 15, 1965.
Note: Total expenditures of \$18,750 include \$3,600 for trenching and \$10,120 for diamond drilling and are included here to simplify apportionment. Total geological survey charges are \$5,030.

REPORT BY
J.M. ALLEN
PROFESSIONAL ENGINEER

JMA:gmc
March 16, 1966

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

GEOLOGICAL SURVEY REPORT
BUTTLE LAKE PROPERTY - VALLEY COPPER MINES LTD. - KAMLOOPS M.D.

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SUMMARY

A total of \$18,750 was expended on the Buttle Lake property and is distributed between the two claim groups as follows: Valley Copper Group 12 \$10,235 and Valley Copper Group 13, \$8,515. It is requested that these amounts be applied for assessment work credit as per the following schedule:

<u>Claim</u>	<u>Record No.</u>	<u>Requested Credit</u>	<u>Total</u>
<u>Valley Copper Group 12</u>			
Nancy 2, 3, 4	15385, 86, 87	1 year each	3 yrs.
" 11, 13, 14	16922, 16924-25	1 " "	3 "
Stewart 1 Fr., 2 Fr.	24213, 24211	1 " "	2 "
Tom 1-6, 13, 14, 16-18	41772-77, 41784, 85 41787-89	3 " "	33 "
Tom 7-12, 15	41778-83, 41786	2 " "	14 "
BL 1 Fr., 1-3, 12-17	41790, 41791-41793, 41802-07	4 " "	40 "
BL 2 Fr.	45370	4 " "	4 "
BL 37	41827	3 " "	3 "
Kathleen	L 5632	Crown grant	
		Total:	102 "
<u>Valley Copper Group 13</u>			
Empire	30183	4 years each	4 "
Stewart 3 Fr.	24212	1 year each	1 "
Nancy 5, 6	15388, 15389	1 " "	2 "
BL 22-25, 30-33, 35, 36, 40-43	41812-15, 41820-23, 41825, 41826, 41830-33	3 " "	42 "
BL 34, 10, 11, 18-21, 4, 5	41824, 41800, 41801, 41808-41811, 41794, 41795	4 " "	36 "
BL 6-9, 26-29, 44, 45	41796-99, 41816-19, 41834, 41835		
		Total:	85 "
		OVERALL TOTAL:	187 "

INTRODUCTION

The Buttle Lake group consists of 76 claims located in the west-central part of Highland Valley. The property includes a number of old copper showings on which work has been done over the past 40 years and limited copper production was achieved at the O.K. Mine one-half mile east of the north end of the property. The work described in this report was carried out in 1965 with the purpose of systematically covering the property in order to relate known showings to structure and lithology and to explore for new mineralization.

LOCATION AND ACCESS

The property is located about six miles southwest of the Bethlehem Copper Jersey pit on the west-central part of the Guichon batholith. It is bounded on the east by the Bethsaida, O.K., Norex, Royal Canadian Ventures (Royal and Cana Groups) and Lornex properties, on the north by Cleveland Mining, and on the south and west by new staking. The property includes all of Island Lake and the western third of Calling Lake.

Access to the property is by good gravel road from a point on the Ashcroft-Bethlehem road opposite Divide Lake. The road traverses the entire claim group, from north to south providing good access to all parts of it.

PROPERTY

The group consists of 76 claims in six groups characterized as follows:

	<u>No. of Claims</u>	<u>Record No.</u>
BL 1-45	43	41791-41835
BL 1 Fr.	1	41790
BL 2 Fr.	1	45370
Nancy 2-6	5	15385-15389
Nancy 11	1	16922
" 13	1	16924
" 14	1	16925
Stewart 1 Fr.	1	24213
" 2 Fr.	1	24211
" 3 Fr.	1	24212
Empire	1	30183
Kathleen	1	L 5632 Crown granted
Tom 1-18	18	41772-41789
	<u>76</u>	

BL claims 38 and 39 found to have been overstacked on Royal claims 1 and 4 have been abandoned and are not included in the preceding list.

PERSONNEL

The work was supervised by J.M. Allen, Ph.D P. Eng. and actual mapping was done by qualified graduate geologist G.R. Rosseau, L.A. Meech, A. Atal and G. Raham during the period August 5 - October 15, 1965.

GENERAL GEOLOGY

The entire claim group is underlain by igneous rocks of granitic affiliation, representing various phases of the Guichon batholith. A table of formation for the area is as follows:

- Glacial till
- Quartz feldspar porphyry
- Bethsaid quartz diorite
- Skeena quartz diorite
- Guichon quartz diorite

Quartz feldspar porphyry was seen in only one place. Here a 100-foot dike of brown to green porphyry striking northeast was observed cutting Bethsaida quartz diorite. The dike rock is chilled for some distance inward from the Bethsaida contact and where chilled takes on a light green colour and a much finer grain. A mineralized zone in a shear parallels the dike on the west but the relationship of porphyry to mineralization is not directly shown. Similar appearing rock occurs to the northeast on the Norex claims but whether this is a continuation of the same dike cannot yet be demonstrated.

Bethsaida quartz diorite outcrops over most of the eastern half of the claim group. The rock is typically a light coloured coarse-grained aggregate of buff feldspar, biotite, quartz and in some places pink orthoclase. The most distinctive feature of the rock is the mode of occurrence of biotite and quartz. Biotite occurs in coarse books (up to 1/2" diameter) and quartz, typically pale blue-grey, occurs in rounded generally ovoid "eyes" of slightly smaller dimension. The rock is remarkably uniform and variations, where found, can almost invariably be related to alteration along joints or shears. This alteration gives the rock a greenish tinge and tends to blur the crystal outlines. Aplite dikes up to 2' in width are common in the Bethsaida, particularly in the central part of the group near the Skeena contact.

Skeena quartz diorite occupies a zone of variable thickness around the Bethsaida quartz diorite. The contact between Bethsaida and Skeena is not well exposed but what evidence is available suggests that it is a gradational over about 100'. The Skeena quartz diorite differs from Bethsaida quartz diorite by having black hornblende as an essential constituent. Skeena may also contain biotite but in flakes or leaves rather than books. Quartz is less common and the feldspars are white and almost all plagioclase. Texture is generally finer and is more variable.

Guichon quartz diorite underlies the western half of the group. This is a coarse to medium-grained rock, generally reddish on weathered surfaces, and composed of feldspar, biotite some hornblende, and minor quartz. The texture of Guichon quartz diorite is variable but is usually distinguishable from the lighter coloured Skeena and the often porphyritic Bethsaida quartz diorite.

STRUCTURE

The structure over the area appears relatively simple. There is a well developed regional grain of north to 010° ^{parallel} both to the major rock contacts and to a prominent faulting direction. Structural determinations i.e. shearing and jointing, in the various rock units do not indicate any significant differences in pattern which might help in differentiating the various units.

Faults and shear zones are the most conspicuous structural features for it is in these where alteration and mineralization are localized. There are two directions of faulting or shearing - 010° and 045° to 065° . Both sets of shears may carry mineralization but the better grade, larger bodies, e.g. Empire and Kathleen, are in the 045° - 065° set. The 010° shear appears to be later than the northeasterly set since none of the northeast shears can be traced to the west beyond it. In the east-central part of the group, four northeasterly shear zones can be seen in outcrop and it is probable that others occur in the overburden covered areas to the north and south. The north-south shearing is also seen in outcrop in the same area and based on magnetic evidence another subparallel zone is thought to exist some 3,500' to the west.

Four prominent joint sets were observed - EW, NE, NW and N-S. Dips on all sets are variable but are generally steep to vertical. In some places, particularly in the EW and NE sets, very closely-spaced joints may occur. These may represent incipient shear zones, particularly since thin films of bornite are not uncommon on joints of this type.

MINERALIZATION

The only metal of any importance occurring in the claims is copper. Copper may occur as chalcopyrite or bornite and their oxidation products, in shear zones, narrow quartz veins, on joint planes, and as disseminations. The most important type of mineralization is that in shear zones. It is this type of mineralization that was the object of considerable earlier work on the Empire, the Kathleen, and at old workings approximately 1,500 feet south of the Kathleen. The most abundant copper mineral is bornite and it occurs in thin (1"-2") veins and as disseminations in a green altered rock composed of coarse

quartz and sericite. The amount of copper ore developed at these workings was never enough to justify mining for the ore zones are narrow (1'-2') and of limited length. At the Empire, the largest, the altered zone reaches widths of 200' and can be traced for about 600'. However, the ratio of mineralization to alteration is low. The Kathleen and the southern showing are smaller and have corresponding smaller envelopes of alteration. If this relationship between mineralization and alteration holds then any orebody of economic size should be indicated by a considerably larger halo of alteration.

Mineralization on joints may occur in any part of the group and in any rock type. The copper mineral is generally bornite occurring as thin (1 mm), discontinuous films on joint surfaces, particularly where these surfaces intersect biotite or hornblende. In no case could this type of mineralization be traced for any distance even on the same joint surface and it is unlikely that orebodies could be formed from this type of mineralization.

Narrow (1"-2") quartz veins carrying bornite and/or chalcopyrite were seen in trenches near the north end of the property. The grades observed were never sufficient to make ore over a mining width and the veins are rare.

CONCLUSIONS AND RECOMMENDATIONS

In view of the number and distribution of copper occurrences on the property further exploration is warranted. The most likely places for ore occurrence are on the extensions of known structures, and at the intersections of the two fault systems. Since all of the outcrop in the area has been well prospected, further exploration will require the use of geophysical and geochemical techniques to test the covered area. To do this most effectively, a combination of soil sampling and follow-up I.P. is recommended.

ATTACHMENTS:

- (1) Plan - Buttle Lake Group Geology, Scale 1" = 1,000', Plate VC-65-I.
- (2) Grouping Plan, Scale 1" = 1/2 mi.
- (3) Statement of Expenditures.
- (4) Statutory Declaration relating to Expenditures.

Report by:

J.M. Allen
J.M. Allen
Professional Engineer

JMA:gmc

Trail Exploration Office, Western District

March 16, 1966

Distribution: Mining Recorder (Kamloops) (2) ✓
Western Exploration (Trail) (2)

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

1965 GEOLOGICAL SURVEY EXPENDITURES
VALLEY COPPER MINES LTD. GROUP NO. 12 - KAMLOOPS M.D.

SALARIES

- 4 - Graduate Geologists (G.R. Rosseau, L.A. Meech, A. Atal and G. Raham) worked on the group during the period August 5 - October 15, 1965 for a total of 50 man-days at \$40/day on Geological Mapping. \$ 2,000
- 1 - Supervisor (J.M. Allen) Geological Mapping and Analysis for 10 man-days at \$41/day from Sept. 15 - 24, 1965. 410

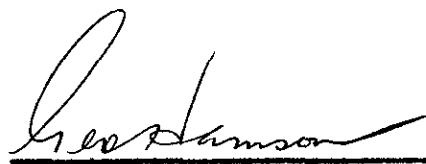
TRANSPORTATION

Truck Rental - 30 days at \$3.50/day 105


TOTAL: \$ 2,515


J.M. Allen
Professional Engineer

Endorsed by:


G. Hamson
Branch Accountant

This is Exhibit "A" to the Statutory Declaration of J.M. Allen, declared before me the17th..... day ofMarch..... A.D. 1966.


A Commissioner for taking Affidavits
for the Province of British Columbia.

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

1965 GEOLOGICAL SURVEY EXPENDITURES
VALLEY COPPER MINES LTD. GROUP NO. 13 - KAMLOOPS M.D.

SALARIES

- 4 - Graduate Geologists (O.R. Rosseau, L.A. Meech, A. Atal and G. Raham) worked on the group during the period August 5 - October 15, 1965 for a total of 50 man-days at \$40/day on Geological Mapping. \$ 2,000
- 1 - Supervisor (J.M. Allen) Geological Mapping and Analysis for 10 man-days at \$41/day from Sept. 15 - 24, 1965). 410

TRANSPORTATION


Truck rental 30 days at \$3.50/day 105

TOTAL: \$ 2,515




J.M. Allen
Professional Engineer

Endorsed by:



G. Hanson
Branch Accountant

This is Exhibit "B" to the Statutory Declaration of J.M. Allen, declared before me the17th..... day ofMarch..... A.D. 1966.



A Commissioner for taking Affidavits
for the Province of British Columbia.

CANADA)
PROVINCE OF BRITISH COLUMBIA) STATUTORY DECLARATION RELATING TO EX-
TO WIT:) PENDITURES ON A GEOLOGICAL SURVEY OF
CERTAIN MINERAL CLAIMS THE PROPERTY
OF VALLEY COPPER MINES LIMITED

I, JAMES ALLEN, Professional Engineer, of the
City of Trail, in the Province of British Columbia, DO SOLEMNLY DECLARE:

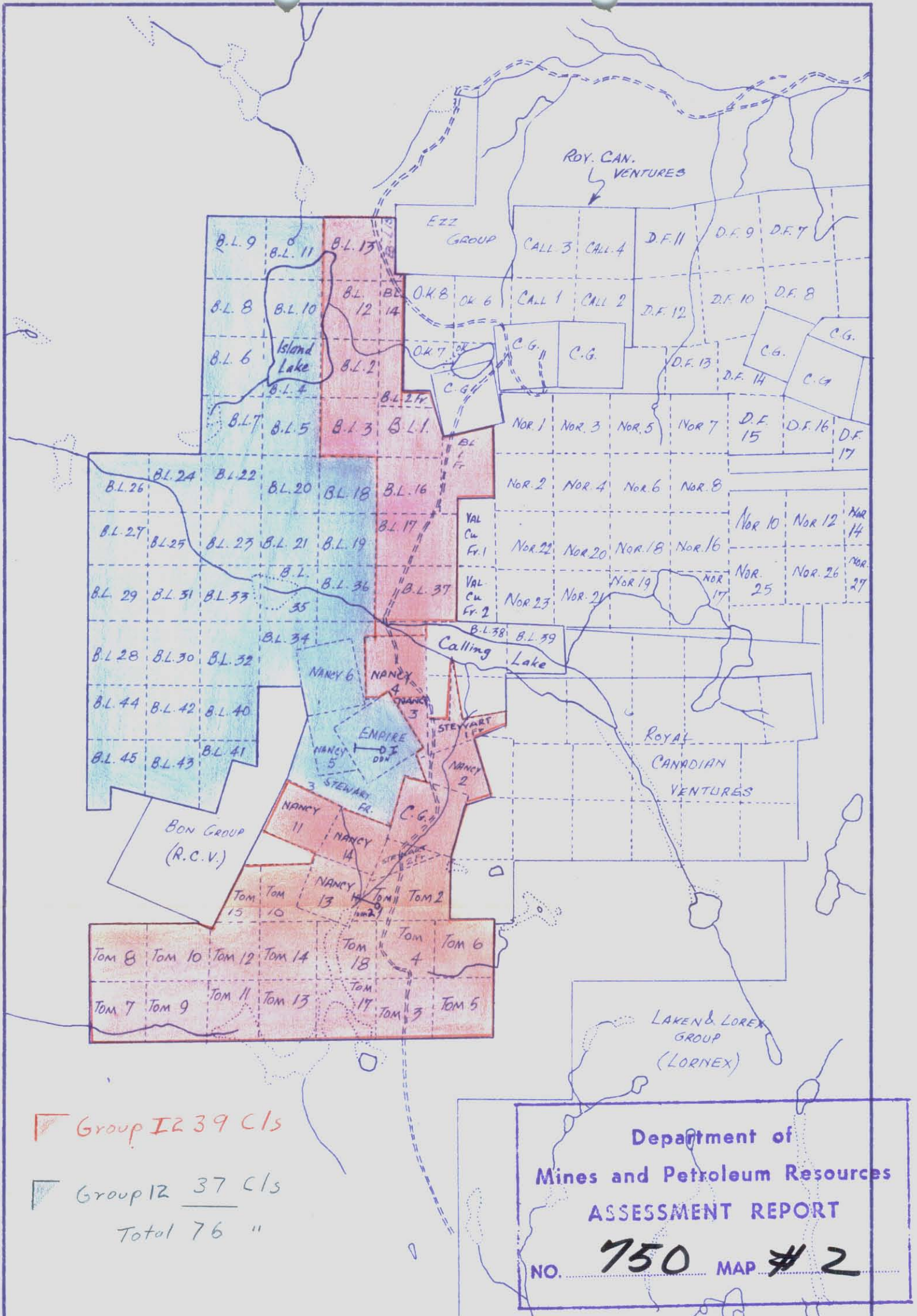
1. That I am the person who prepared a geological report as the result of surveys carried out of certain mineral claims, the property of Valley Copper Mines Limited, situated in Kamloops Mining Division.
2. That copies of the said report are being filed with the Mining Recorder in Kamloops.
3. That attached hereto and marked with the letters "A" and "B", upon which I have signed my name at the time of declaring hereof, are statements of expenditures incurred in connection with the geological survey of the said claims showing in addition the dates during which those making the said survey performed their work.

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

DECLARED before me at the
Municipality of Tadanac, in
the Province of British
Columbia, this 17th day of
March, A.D. 1966.

James Allen

Robert Stewart
A Commissioner for taking Affidavits for British Columbia



The Consolidated Mining and Smelting Company of Canada Limited

DRAWN BY:		TRACED BY: <i>A.P.A.L.</i>	
REVISED BY:	DATE:	REVISED BY:	DATE:

VALLEY COPPER CLAIMS
 BUTTE LAKE GROUPING
 HIGHLAND VALLEY, KAMLOOPS M.D.

SCALE: 1" = 1/2 MILE DATE: JANUARY, 1966 PLATE:

