

KELSEY GROUP  
OKANOGAN COUNTY  
STATE OF WASHINGTON  
UNITED STATES OF AMERICA

John Callison  
302- 540 Bernard

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812107

Carling D.P. Simpson

Drilled Aug/66

## INTRODUCTION

The undersigned was retained by Darrel Patterson Simpson on behalf of Sun Mining Company of Vancouver, B. C. and registered in the Province of British Columbia for the purpose of examining a property long known as the Kelsey. The present holdings include unpatented claims not previously part of the Kelsey Group all of which are under option to the aforementioned Darrel Patterson Simpson.

The following report is based on his personal one day examination, study of a report by Joseph B. Umpleby in Washington Geological Survey Bulletin #5 and on his previous knowledge of conditions pertaining to the Canadian side of the U. S. -Canada border.

Because of snow coverage at the time of examination mineralization on two claims only was examined. Mr. Stewart Mayo who once owned the property and has done work on it acted as guide.

## SUMMARY

It is evident from the limited examination made of the ground that copper mineralization is widespread in both intruded and intruding rocks which underlie the claims. This mineralization occurs on joint and bedding planes in the thin veinlets and as very fine disseminations, particularly in the light colored intrusives which intrude the greenstones at the south end of the Denver Patented claim. Nearly every piece of surface rock broken showed the characteristic green stain of malachite, a carbonate of copper, and it is concluded that these rocks have not been given enough attention in the past. An old working on the Borderline #2 Claim and some lumps of very high grade chalcopryrite on the dump suggest that a pod of a good grade of ore was extracted. Reports on other claims in the immediate area indicate that a good grade of gold-copper ore has been found in several. \* Whether there are substantial tonnages of minable material can be determined only by a program of investigation involving modern techniques. It is here submitted that a preliminary program

\* Washington Geological Survey Bulletin #5

consisting of bulldozing surface exposures, detailed geological mapping, soil sampling and an induced polarization survey with some follow-up diamond drilling is fully warranted. Advantages of location relative to necessary facilities, climate, and topography is another very important consideration.

## PROPERTY

The property consists of two groups of claims identified in the option agreement as follows:

Group A consisting of fifteen unpatented claims: Borderline 1 - 9 inclusive, O.K. Copper, Hilltop, Wesaw Copper, Lakeview, Colorado Quartz Lode and Big Sage No. 1.

Group B consisting of the nine patented claims comprising the original Kelsey Group and known as Big Iron No. 1, Big Iron No. 2, Kettle Lake, Alhambra, Washington, Osoyoos, Tunnel Site, Ivanhoe and Denver.

All the above claims are situated in Sections 5 - 8, Township 40 N - Range 27 E. W. M. , Okanogan County, State of Washington.

The mineral rights to these claims have been optioned by D. P. Simpson Jr. from Valley Evaporating Company of Oroville, Washington and from W. C. Hallauer also of Oroville.

The unpatented claims are in good standing until August 31, 1966 but under the terms of the option the purchaser agrees to record current assessment work by May 31, 1967 and on May 31 of each year thereafter.

## LOCATION and ACCESSIBILITY

Both groups of claims are located immediately west of a paved highway connected to the highway systems of B. C. and Washington thus insuring ready access to anywhere on either side of the border. They are within a few minutes drive of settled communities thus eliminating the need for establishing housing facilities. The climate is that of the Southern Interior Dry Belt of B. C. and the area will enjoy an average year round temperature in excess of 50° Fahr. with very little precipitation, a light cover of snow may persist for several months but is not a problem, that would contribute to the cost of operations.

## HISTORY

The Kelsey Group is briefly described on pages 66 and 67 of Bulletin # 37, Inventory of Washington Minerals, Part II, Vol I which gives as further references Bulletin # 5 of the Washington Geological Survey published in 1911 and the Copper Handbook published in 1908.

It appears from these references that the property was originally held by the Detroit-Oroville Exploration Company with headquarters in Detroit, Michigan. At that time development consisted of several small opencuts and shafts in addition to 6 diamond drill holes each 100 feet deep. Reference is made to 18 samples averaging 0.04 oz. Au, 0.6 oz. Ag, 2.62 % Cu. These were selected at random by the government geologist from a large number taken by the operators from all over the property. No ore was shipped and there is no record other than verbal statements by recent owners that any ore was shipped from this particular property.

Recent owners have drilled three diamond drill holes all of which have not been split or assayed and no assays were made available to the writer.

The writer has no information regarding the intervening history but it appears that the property has remained dormant for many years. It is apparent that early interest centered on the gold possibilities of the area and it is only recently that low cost open pit operations elsewhere have drawn attention to the copper possibilities of the area. These possibilities are enhanced by the present high price of copper.

## PREVIOUS WORK

Examination of previous work on the Denver claim was limited to one open cut on the Denver which revealed pyrite and chalcopyrite mineralization in a shear zone in igneous rocks. This area should be opened up by bulldozing to better expose the mineralization.

On the Borderline No. 2 mineral claim an old tunnel and stope and dumps were examined. This work was in a shear zone and crumple in greenstones which apparently contained a sizable pod of high grade chalcopyrite judging from some of the material on the dump. It is stated verbally that some ore was shipped from here. One large boulder of almost solid chalcopyrite was noted on the dump along with a number of smaller pieces. The core from recent drill holes was examined and one section about 100 feet long was well

silicified and was mineralized with pyrite and chalcopyrite. The copper content of this section could be in the range of 0.25% Cu to 0.50%. The unsplit core was slightly mineralized but did not appear to have any mineral of possible ore grade. These holes were drilled for assessment work and have little bearing on the overall picture.

## GEOLOGY

The area in general is one of sedimentary and volcanic rocks of carboniferous age. (Anarchist Group in Canada) intruded by at least two periods of igneous rocks, all metamorphosed to the extent that it is often difficult to distinguish one from the other. Occasional pods of limestone are found and in B. C. a skarn zone related to one of these was mined for its gold content. Quartz veins have been mined in the past for their gold and copper content but none of these are in themselves of sufficient size to support a mining operation of any consequence. Likewise there are many localized shear zones carrying pods of mineralization which may produce a small tonnage of ore. It appears to the writer that with these as nuclei there are areas of widespread low grade mineralization where the chalcopyrite occurs in numerous small veinlets and disseminations and in joint planes which could conceivably make ore for a large tonnage open pit operation particularly towards the south end of the property.

The following extract from the 1911 report by J. B. Umpleby gives a very good description of the rocks and mineralization:

"The country rock, as exposed on these claims, is predominantly greenstone, although large amounts of clay slate and quartzite are present. The greenstones seem to be interbedded with the sedimentary members, although it is possible that more careful study may show some of them to be intrusives. In the hand specimen they are usually green or greenish gray and present a granular to porphyritic texture with the grains rather ill-defined. Hornblende, feldspar, and quartz can be distinguished, and little veinlets of quartz usually less than a quarter of an inch wide occupy joint and fracture cacks. Chalcopyrite, commonly altered on its surface to a blue, black or green sheen, and pyrite occur as disseminations both along the quartz stringers and out into the rock mass. The specimens studied were so extensively altered that accurate classification was not possible. From such determinations as were made, however, it appears that the rock is a basic andesite, consisting of oligoclase, andesine and a few labradorite feldspars, biotite, titanite, zircon, apatite and magnetite. Secondary epidote is nearly always present in conspicuous amounts, while chlorite, kaolin and a little sericite are variously found. Pyrite or chalcopyrite, and usually both, were present in all the slides studied.

Mineralization has affected all varieties of the country rock, copper in the form of chalcopyrite occurring as disseminations and as films along fracture lines and bedding and joint-planes. In places, non-persistent quartz veins carrying chalcopyrite and pyrite occur but strong fissure veins are not found. A remarkable feature of the deposits is the very shallow depth of oxidation. Primary minerals usually appear by knocking small chips from the surface, even where copper stains are most extensive. This clearly indicates that secondary concentration on a large scale cannot be expected. The company have had a great many assays made on various parts of the property and an average of eighteen of these which were selected at random from a number of assays furnished by Mr. Kelsey gave 2.62 percent in copper, 0.6 in silver and 0.04 ounces in gold.

In conclusion it appears that this group of claims contains widely disseminated copper, but whether the percentage of copper on a large tonnage basis is high enough to constitute an ore, has not been proven. "

#### RECOMMENDATIONS

Because of widespread mineralization evident when the weathered and lichen covered rock surfaces are broken in some areas of the Kelsey property it is recommended that a program of exploration consisting of bulldozing, soil sampling, geological mapping and an induced polarization survey and some diamond drilling be done on the property. The amount that could be spent on this can vary between wide limits but if done in proper sequence very little unnecessary work would be done. A detailed geological map of the ground with emphasis on variations in the degree of mineralization coupled with a geochemical map covering areas of overburden is the first requisite. This may require some bulldozing.

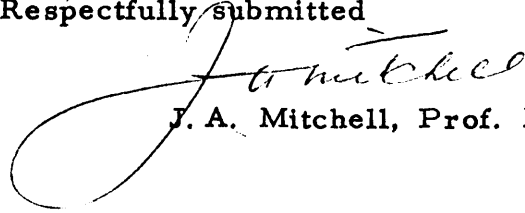
Areas should then be selected for an induced polarization survey which should give satisfactory results in this type of mineralization. Anomalies found by this survey should be drilled. Some drilling can be done before the geophysical work is done in areas of obvious mineralization particularly on the south end of the property. This drilling should be done in large bits to ensure good recovery and reliable assays.

The cost of this initial program should be about as follows:

Geological mapping	5,000.00
Geochemical surveying & assaying	3,000.00
Induced Polarization Survey	10,000.00
Bulldozing	2,000.00
Diamond Drilling	10,000.00
	<u>30,000.00</u>
Unforeseen contingencies & super- vision	<u>5,000.00</u>
Total Cost of Initial Program	\$ 35,000.00

If favourable results are obtained from this program  
a further program would then be planned.

Respectfully submitted

A large, elegant handwritten signature in cursive script, reading "J. A. Mitchell". The signature is written in dark ink and is positioned above the typed name.

J. A. Mitchell, Prof. Eng.

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**REPORT ON INTERNATIONAL CLAIM**  
**Osoyoos District, B.C.**

This claim lies immediately north of the International Boundary southwest of Osoyoos.

It was formerly one of a larger group of claims held by D. P. Simpson and K. Butler of Osoyoos, but has been optioned by the Sun Mining Co. of Vancouver, B.C.

It is underlain by much metamorphosed igneous rocks, for the most part diorite. At a point close to the border a number of quartz veins occur in a random manner in a shear zone of undetermined extent. These have been opened up by a number of open cuts now caved. Digging into the walls of the cuts reveals material intensely stained and coated with malochite and zurite and some chalcopyrite can be seen. Both quartz and crushed country rock are stained and coated. The cuts extend for a length of about 160 feet in an east west direction, all showing carbonate staining but generally too caved to properly examine.

A tunnel below the outcrops apparently failed to locate a downward continuation. This is not altogether surprising because of the random discontinuous nature of the veins. It is recommended that an area of the rock surface in the vicinity of the veins be exposed by bulldozing to give a better appreciation of the possible extent of the mineralized area. One or two days with a bulldozer equipped with ripper teeth should suffice.

Respectfully submitted,

J. A. Mitchell.