Copper Queen Expl. — Telkwa Prop. 811965

File 7. 86 Claims :— → 5M. Shares.
Applic for listing

Mr. Mikey Montaine → 683-0511.

Mr. AB. Manners,
N. Vanc.

Indefin. to date #40,-50,000.

1/04

Boissoneault 985-0290.

93-L-11

November 10th, 1969.

Mr. H. Wayne.
Nemaska 985 1671.
683 0511

From: John Boissoneault,
Consulting Geologist,
905, 555 West 28th St.,
North Vancouver, B. C.

To: President & Directors,
Copper Queen Explorations Ltd.,
Suite 418,
837 W. Hastings Street,
Vancouver 1, B. C.

Dear Sirs:

At your request I have prepared the following report on the Company's Telkwa property, a copper and silver prospect in the Smithers area of the Omineca Mining Division in British Columbia. This report is subsequent to a previous report by Franklin L.C. Price, P. Eng. It is based on the following:-

1. A geological examination of the property by the writer on July 4th, 5th, and 6th, 1969.

2. An induced polarization survey carried out on the southern section of the property during August, 1969 by Seigel & Associates of Vancouver.

3. A magnetic, electro-magnetic and geochemical survey carried out by the writer during the period of July 22nd and July 30th.

4. The examination of the stripping done after the completion of the surveys - this includes the examination of thin sections.

5. The study of previous work done on the property by Mr. Price, as well as general information on the area contained in the files of the Geological Survey of Canada.

PROPERTY DESCRIPTION

The property consists of 78 located contiguous mining claims. A list of these claims which make up the property, along with their recording numbers and dates of expiry, are in the appendix attached to this report.

Several claim posts were checked by the writer when he was on the property and were found to be properly marked and tagged. All information regarding the ownership of these claims and their status has been taken from the records of the Company and accepted by the writer as being official.

LOCATION AND ACCESSIBILITY

The claims are located near the headwaters of Winfield Creek which flows into the Telkwa River just southwest of Smithers in the Omineca Mining Division of Central British Columbia, at 54° 42' North latitude and 127° 29' West longitude.

The claims are accessible by helicopter from a permanent base at Smithers 15 miles away. It is also possible to drive to the property with a 4-wheel drive vehicle via a good gravel road from Telkwa which comes within 12 miles of the property and a bush road the remaining distance - a total distance of 29½ miles from Telkwa. This distance could be substantially shortened by building a more direct road from the property to the Telkwa Road.

TOPOGRAPHY AND CLIMATE

The claims are in a mountainous area of considerable relief (1100 ft.). The elevation varies from 4500 ft. to 5600 ft. above sea level. However, the South Central section of the property covered by the geophysical and geochemical surveys is a gently undulating plateau with a maximum relief of less than 200 ft. over a distance of 3/4 mile. The high plateau is disected to the east and west by Winfield Creek and slopes gently southward.

The vegetation is sparse and consists mostly of dwarfed balsam trees and shrubs, mosses and lichens. The water table is high and some areas are swampy. The overburden is quite thin and bedrock can be exposed in most places by stripping with a bulldozer.

The climate is continental in nature but is modified somewhat by the proximity to the coast. At the Smithers Airport (elev. 1718') the average yearly precipitation is 13" rain and 73" snow. The mean temperatures are for July 57.5° and for January 14.9°. On the property the temperatures are similar but there is considerably more snowfall. Usually there is permanent snow on the property from October or November until the later part of May or early June.

HISTORY

The occurrence of copper in the area has been known since 1917 and activity on the property from that time up to 1967 is described in Mr. Price's report. Since that time Mr. Price's recommendation regarding stripping of the areas containing copper mineralization has been carried out. On July 4th, 1969 the writer examined the property and the areas exposed by the previous stripping and advised the Company that sufficient copper mineralization had been exposed by the previous programmes to warrant a geological, geophysical and geochemical exploration programme over the entire South Central and Southern portions of the property. This programme was for the purpose of locating prospective large tonnage, low grade disseminated copper - silver deposits occurring in altered sections of the Hazelton volcanics and was completed in September, 1969. The results of this programme are the subject of this report.

REGIONAL GEOLOGY

The property is in the North Central Cordilleran, south of the Skeena Arch in the broad Mesozoic volcanic and sedimentary trough which lies in between the Coast intrusive belt to the west and the Cassiar intrusive belt to the east.

According to the Geological Survey of Canada Map 971-A (Smithers and Fort St. James) the property is underlain by the Hazelton group of Jurassic to Cretaceous Age, which has a total thickness of 16,000 feet. It consists mainly of volcanic rocks ranging in composition from Andesite to Rhyolite, but also has sedimentary sections. Numerous occurrences of copper and silver had been reported in these rocks, most of them confined to the volcanic flows and tuffs.

LOCAL GEOLOGY AND PETROLOGY

Rhyolite porphyry, dacitic tuffs, vessicular and amygduloidal andesite and andesite porphyry have been identified in the area covered by the survey. These rocks have been complexly folded and the spacial relations between the formations are difficult to ascertain but it appears that the lithology changes from andesite to dacite to rhyolite as one traverses from south to north over this area. The general strike appears to the NE-SW and the dip gentle and southward.

The surveyed section of the property has been subdivided arbitrarily into 5 "areas". Several thin sections have been cut from samples taken from these areas and examined under a petrographic microscope. Each of these areas will now be discussed separately.

No. 1 AREA

In the vicinity of line 6 between 36° S. and 40° S. is underlain by banded and speckled purplish dacitic tuffs with contorted banding interbedded with a volcanic breccia or agglomerate. Rusty and yellowish alteration is visible. Megascopic examination reveals malachite staining ($CuCO_3.CuOH_2$) as well as fine disseminations of chalcocite (Cu_2S), bornite (Cu_5FeS_4) and minor pyrrhotite (Fe_7S_8) along with numerous silica stringers or bands. Petrographic examination reveals silicification and alteration to clay minerals associated with microfracturing and quartz veining along with the formation of limonite and serecite. This alteration appears to be hydrothermal in origin.

North of Area 1 dacitic tuffs and agglomerates containing silicified fractures are exposed.

No. 2 AREA

No. 2 area in the vicinity of line 6 W. between 44° S. and 52° S. is underlain by coarse dark green to brownish green andesite porphyry with pink feldspar phenocrysts and small specks of specularite (Fe_2O_3) and magnetite (Fe_3O_4). The feldspar phenocrysts are visibly altered to clay minerals in some areas and there is a general formation of chlorite and epidote. Petrographic examination reveals the composition of the rock to be andesite and shows low grade regional metamorphic assemblage of the secondary minerals chlorite, serecite, calcite and limonite along with considerable magnetite. Intense shearing occurs between 52° S. and 54° S.

with an introduction of carbonate minerals, chlorite and epidote.

At 40° S. the rock becomes fine grained and relatively unaltered.

No. 3 AREA

This consists chiefly of amygdaloidal and vesicular volcanics presumably andesite and basalt. The amygdules consist of calcite and epidote and there is general chloritization, the rock appearing to have undergone metamorphism similar to No. 2 area. West of line 7 W highly altered porphyritic sections were found with intense epidotization and chloritization at times replacing the phenocrysts. These rocks were not examined petrographically.

No. 4 AREA

West of line 8 W at about 35°S. is underlain by rhyolite and rhyolite agglomerate interbedded with dacitic rocks, some of them clastic and some of them containing white fledspar phenocrysts. No significant amount of alteration was observed in this area.

No. 5 AREA

At about 32°S. on line 4 W.

and

No. 6 AREA

At about 44°S. on line 2 W. are underlain by purplish dacitic tuffs with contorted bands and recrystalized silica spheres interbedded with porphyritic sections. Malachite and azurite ($CuCO_3.2CuOH_2$) are visible along with chalcocite and bornite in both areas and in some sections in Area 5 they are abundant. Petrographic examination reveals recrystalized silica and the destruction of the mafic minerals to limonite. There are two stages of introduction of calcite and quartz in lenses and veinlets which appear to be associated with the copper minerals. There is intense alteration of plagioglase, phenocrysts to sericite in some areas and there is evidence that this alteration is hydrothermal in origin.

In conclusion, it appears that there is a hydrothermally altered belt of dacitic volcanics crossing the surveyed area in contact with more basic volcanics to the south. All the visible copper occurrences found in this area are limited to this belt of rocks.

CHEMICAL SURVEY

The geochemical survey was done under the supervision of the writer. The "B" horizon was sampled every 200 feet along the survey lines, taking care to collect the material well below the organic horizon. Analysis for copper and silver was done by atomic absorbtion after hot acid extraction on the minus 80 mesh fraction by Bondar Clegg & Co. of North Vancouver, B.C.

The purpose of the survey was the location of primary syngenetic distribution patterns in what was considered to be essentially a thin, poorly developed residual soil. This type of pattern was expected for silver because of its general immobility and for copper because of the alkaline conditions in the soil and the tendency of copper to co-precipitate with limonite which was common in the area. Leaching by ground waters was expected to be minor because of the presence of calcium minerals and the sparcity of iron sulphides in the bedrock. Because of the southward slope of the ground surface, especially in the southern portion of the survey area and the possibility of alpine glaciation, it was expected that the distribution patterns, especially that of copper, would be somewhat distorted and displaced south-eastward, as well as modified by other factors such as extreme frost, plant activity and drainage.

The geochemical survey plans for both copper and silver show 4 distribution patterns, all having a general strike of approximately N.E. to S.W. and all having high narrow peaks (except for No. 2) and distinguishable thresholds.

Each of these Patterns will now be discussed separately.

PATTERN No. 1

Pattern No. 1 is on lines 7 W. to 5 W. between 24°S. and 30°S. It is a weak anomaly with peak values from 4 to 5 times background for copper and 2 times background for silver.

PATTERN No. 2

Pattern No. 2 crosses the surveyed area between 28°S. and 40°S. but is discontinuous. It is very week on lines 6 W, 7 W and 8 W, but is very strong on lines 4 W and 3 W. Peak values being in excess of 35 times background for copper and 5 times background for silver. At this point it is in excess of 400 ft. wide and is in general agreement with the results of a previous geochemical survey done by Franklin Price.

PATTERN No. 3

Pattern No. 3 is broad and continuous for both metals, crossing the surveyed area between 40°S. and 46°S. It is a weak anomaly with peak values of 3 times background for both copper and silver.

PATTERN No. 4

Pattern No. 4 crosses the surveyed area between 64°S. and 52°S. It is medium strong on lines 6 W. and 7 W. where the peak values are 5 times background for copper and 3 - 4 times background for silver. At this point the anomaly lies south of the area that was covered by the geophysical survey and because of the steep slope the pattern would be displaced southward.

The distribution patterns for both copper and silver are generally in good agreement and support geophysics in most cases.

Additional soil sampling should be done to better define the anomalies. This will be discussed under "Recommendations."

MAGNETICS

The property was covered by an aeromagnetic survey flown at an elevation in excess of 1000 feet as shown by the Geological Survey of Canada Map 5310G. (Telkwa), scale 1" = 1 mile. A broad magnetic anomaly of total amplitude in excess of 100 gammas lies immediately to the southwest of the surveyed area. This anomaly could be caused by a large deep-seated intrusive. There is a similar but smaller magnetic high off the northern part of the property.

A ground magnetic survey was conducted by the writer on the southern portion of the property in September. A Scintrex MF-1 portable magnetometer was used and the readings corrected against periodic readings taken at a base station. The contour plan of the survey shows several interesting features.

The first of these is a strong linear magnetic high crossing the surveyed area between 45°S. and 50°S. It appears to be displaced between lines 6 W. and 5 W. with the west side having moved northward. We can therefore infer that a fault crosses the surveyed area in the vicinity of line 6 W. The magnetics show that the causative body is deeper on the east side than on the west side and dips to the south.

Another magnetic high is located on lines 7 W, 6 W and 5 W. between 52°S. and 57°S. It is rather equidimentional in outline and could possibly also be displaced.

Three other strong linear magnetic highs, some with corresponding lows, are located north of this. Two of them are west of the inferred fault and strike northwesterly; the other is east of the inferred fault and strikes northeasterly.

When one examines the magnetic background it becomes evident that there is a noticeable change between 36°S. and 40°S. on all the survey lines. This is interpreted as a lithological change between relatively acid rocks to the north and relatively basic rocks to the south, the basic rocks having a higher magnetic susceptibility. This interpretation agrees well with the observable geology.

ELECTRO-MAGNETICS

The electro-magnetic survey was conducted by the writer in September on the southern portion of the property. A Geonics EM-16 Receiving Unit was used; the transmission was from Cutler Main (frequency 17.8 kilocycles) and the readings taken with the observer facing south. At this high frequency many structures are more conductive than at low frequencies, and this must be taken into account in the interpretation of the results.

The sharpest electro-magnetic feature is a strongly conductive zone crossing the surveyed area between 24°S. and 29°S. and apparently dipping steeply to the north. The anomaly is supported by geochemical pattern #1 for both copper and silver. It is displaced near line 6 W with the west side having moved northward; this is in general agreement with the magnetic interpretation.

A conductor axis of medium strength crosses line 4 W at 34°S. and appears to dip northward. It is supported by the eastern end of geochemical pattern #2, and a good surface showing of copper minerals (Area #5). It does not appear to cross line 5 W.

Conduction of medium strength occurs between 44°S. and 45°S. on lines 4 and 5 and appears to be displaced northward at line 6 where it occurs at 40°S.

A strong conductor occurs at 49°S. on line 5 and also appears to be displaced northward on the west side of the assumed fault. It has a steep dip and corresponds with a strong magnetic anomaly.

Several other conductor zones occur on the property and generally appear to strike east-west, although in some cases correlation between the lines is ambiguous. The electromagnetic results of this survey should be used in conjunction with the other geophysical results and with the geochemical survey in choosing targets for drilling, and should not be followed up if totally unsupported.

CHARGEABILITY

An induced polarization survey was conducted by Seigel & Associates in August of 1969, using an M.K. IV Time-Domain I.P. Unit. A 400 ft. spread was used with a 3 electrode array, the station interval being 200 ft. Detailed work was done on 200 and 100 ft. spreads. A report by John G. Baird, P.Eng. on this survey should accompany this one.

Contour maps of the chargeability values in milliseconds are included in this report, 2.0 milliseconds being the contour interval. There are maps of the 400 ft. spread and maps of the 200 ft. spread and the 100 ft. spread on the southern part of the surveyed area. Considering the expected chargeability range for volcanic rocks of this type, chargeabilities in excess of 8 milliseconds are worthy of investigation since they can be caused by 1% sulphide by volume. Since the copper mineral showings consists of chalcocite (79.8%) and bornite (63.3%), a 1% sulphide showing would be quite significant. Four such anomalous areas can be noted on the contour plans and will be discussed separately.

ANOMALY No. 1

Anomaly No. 1 is located at 36°S. on line 6 and does not show on the 200 ft. spread. It is caused by a body below 200 ft. in depth and coincides with a weak electromagnetic conductor and a good surface showing of disseminated copper sulfides (Area #1).

ANOMALY No. 2

Anomaly #2 crosses line 6 at 43°S. and also occurs on lines 5 and 7. It is long and linear and shows well on the 200 ft. and 100 ft. spreads although it is weak on the 400 ft. spread. On line 6 W it corresponds with a linear magnetic high and weak electromagnetic conduction.

CONCLUSIONS AND RECOMMENDATIONS

It is the writer's opinion that the results of the geological, geophysical and geochemical work presently completed on the property indicate several areas that warrant further exploration by diamond drilling. There are at least 6, and maybe 8, target areas where anomalous geophysical conditions exist that correspond with either geochemical dispersion patterns or surface occurrences of copper mineralization. All of these should eventually be tested by diamond drilling since there is, in my opinion, a good chance of interesting copper mineralization of commercial significance in at least two areas.

I would recommend, firstly, that additional soil sampling be done to better define the geochemical anomalies. Samples should be taken in between the original sample locations in the anomalous areas so that in these areas values will be available every 100 ft. Also, soil sampling should be done on lines 2 W and 1 W and in some cases in between the present grid lines. An additional 200 samples should be taken altogether and analyzed for copper and silver.

It would also be useful to do detail work on the zones of electromagnetic conduction using a vertical loop, tilt angle system, or a horizontal loops compensation system, in order to ascertain the attitude of these zones. In addition to this, readings should be taken along lines

3 W and 2 W in order to extend the conductor axis at 34°S. on line 4 W since it coincides with strong geochemical anomalies and with surface copper mineral occurrences.

Following this, a preliminary drill programme consisting of 4,000 ft. in 8 holes should be planned to test the drill targets referred to in the first paragraph. Initially the 4 induced polarization "highs" should be tested and in each case the hole should be designed so as to intersect coincident magnetic or electromagnetic anomalies where these occur. In addition to this, electromagnetic anomalies should be drilled where they are supported by geochemical dispersion patterns as in the case of the one at 32°S. on line 4 W. If the preliminary programme is successful, and mineralization of commercial significance is encountered, then the geochemical and geophysical survey should be extended over adjoining parts of the property; also a secondary drill programme consisting of approximately 6,000 ft. should be postulated to further explore the zones of mineralization encountered initially.

These recommended programmes should be supervised closely by a qualified geologist engineer since the anticipated mineralization is partially in the form of finely disseminated chalcocite, the identification of which could present some problem.

THE ESTIMATED COSTS FOR THE RECOMMENDED PROGRAMMES ARE AS FOLLOWS:-

1.	Detail Geochemical Sampling and Analysis	$ 500
2.	Detail Electromagnetic Survey	500
3.	Preliminary Drilling Programme - 4000 ft. at $12 per ft. . . .	48,000
4.	Core Splitting and Assaying	2,000
5.	Possible additional Geophysical and Geochemical Survey	6,000
6.	Secondary Drill Programme 6000 ft. at $12 per ft.	72,000
7.	Core Splitting and Assaying	5,000
8.	Supervision and Professional Services . .	15,000
	Sub Total	$ 137,000
	Contingency factor plus 10%	14,000
	TOTAL:	$ 151,000

Respectfully submitted,

John R. Boissoneault,
Professional Geologist