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Kaza Copper

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# REPORT

on

# FIRE GROUP OF CLAIMS

(Fire #1, #2, #3, #4)

for

NORTHSTAR EXPLORATIONS LTD.

By

A. J. Sinclair

July 24, 1967

## INTRODUCTION

An examination of the Fire group of claims south of Kaza Lake was made at the request of Mr. R.M. Tait, of North Star Explorations. The writer's visit was arranged to coincide with a trip by Dr. W.H. White to the copper showing of North Star Copper Mines. The writer examined showings on the Fire group on Wednesday, July 12, 1967, accompanied by Mr. T.C. Scott, of North Star Copper Mines. These showings are restricted to claims Fire #1, Fire #2, Fire #3 and Fire #4.

The Fire group is located in Omineca Mining division, British Columbia, about 5 to 6 miles south of the southern end of the Caribou Heart Range. Kaza Lake is about 4 miles NNE of the group (see Fig. 1). The claims are mostly at the southeast corner of the McConnell Creek map sheet (Lord, 1948). Access is presently via float plane from Smithers, B.C., to Kaza Lake, a distance of about 100 miles, and thence by foot for about 4 miles WSW from the outlet of Kaza Lake. Company officials have recently marked a foot route with flagging from Kaza Lake to the showings.

Showings are on a pronounced knoll overlooking Lion Creek valley to the west. A large area surrounding and including the Fire group is an old "burn" with considerable "deadfall" and thin brush cover. A few isolated stands of small conifers are located less than a mile to the east of the showings. The nearest surface water is Lion Creek, about one-half mile to the southwest.

## SUMMARY

1. The Fire group in Omineca mining division is underlain mainly by volcanic rocks of the Jurassic Takla group which Lord (1948) states "... afford promising prospecting ground."

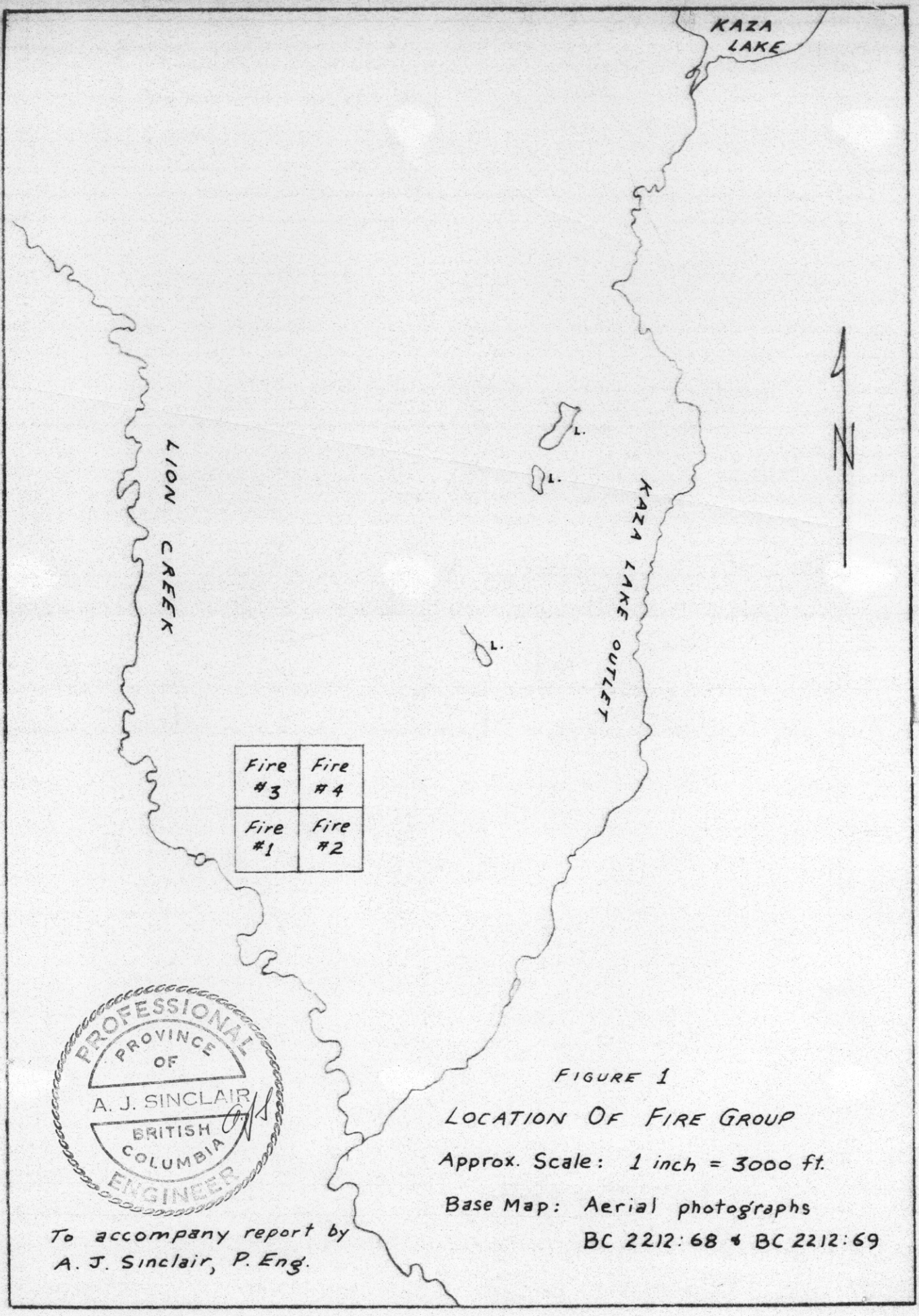


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FIGURE 1

LOCATION OF FIRE GROUP

Approx. Scale: 1 inch = 3000 ft.

Base Map: Aerial photographs
BC 2212:68 & BC 2212:69

To accompany report by
A. J. Sinclair, P. Eng.

2. Rock types underlying the property are andesite porphyry, an undivided volcanic unit consisting of several mineralogic types of flows, rhyolite dykes, marble and hornblendite. All have been affected by epidotization.

3. Sulphides (pyrite and chalcopyrite) occur along linear belts that are slight topographic depressions, have abundant gossan developed on them, and contain outcrops of hornblendite intermittently along their length.

4. Chalcopyrite is present sporadically throughout gossan zones, but the high degree of weathering does not permit the taking of meaningful channel or chip samples.

5. Some indication of potential size of the main mineralized zone is given by the distribution of gossan outcrops. A conservative estimate is about 50 feet wide over a distance of about 1000 feet. Several other linear mineralized zones exist, but these are not as well exposed as is the main zone.

6. Several trenches are required across the main mineralized zone in order to obtain fresh rock for assay and to determine the true extent of mineralization.

7. Following trenching, detailed plane table mapping should be done on a scale of 50 feet equals one inch. This will allow precise evaluation of the surface extent of gossan and will provide a base map for future work if such is warranted.

## GENERAL GEOLOGY

The area is underlain by an essentially volcanic sequence of Jurassic Takla group (Lord, 1948). These have been affected by at least

two periods of deformation of Jura-Cretaceous and Early Tertiary ages. Both ages of folds axes plunge gently and trend northwesterly. The area is cut by numerous regional thrust faults related to Tertiary deformation and abundant smaller scale fractures. Lord (1948, p.66) states: "Most of the known metalliferous deposits are in volcanic members of the Takla group and, accordingly, areas underlain by these rocks afford promising prospecting ground."

General geology in the area examined is shown in Figure 2. Aerial photographs were used as a base for mapping because no adequate topographic map was available.

Rock Types Underlying Fire Group

Andesite Porphyry: The eastern three-fourths of the area examined is underlain by a distinctive rock containing 10 to 30 percent platy phenocrysts of white plagioclase up to one-half inch in maximum dimension. Most phenocrysts are about one-quarter inch in maximum dimension. No preferred orientation of phenocrysts is apparent. An aphanitic matrix is dark grey-green on a fresh surface, but weathers to a deep red-brown colour characteristic of hematite. This unit appears identical with Andesite porphyry at the showing of North Star Copper Mines north of Kaza Lake.

Undivided Volcanic Unit: This unit consists of a variety of volcanic rocks that seem to be entirely lavas, mainly porphyritic. Two fairly prominent types are: (1) andesite porphyry containing about 10 to 20 percent small plagioclase phenocrysts about 1/8th to 1/4 inch in diameter in a dark green aphanitic matrix, and (2) hornblende andesite containing about 10 percent hornblende and plagioclase phenocrysts in a dark green aphanitic matrix. Other varieties are also present including a completely aphanitic,

dark green rock, although most outcrops observed are porphyritic. Contacts between rock types within this unit were not observed. Most weathered surfaces have a pale buff colour, although in places black manganese stain is present.

Felsic Dykes: Two mineralogic types of dykes are present in the general area of the showings. The first of these, observed west of the showings outside the claims group, is a medium-grained monzonite consisting of white plagioclase, pale pink K-feldspar and about 5 to 10 percent hornblende. These weather to a very pale pink colour that appears white from a distance. The second type of dyke is a rhyolite porphyry that crops out abundantly on the Fire group, cutting rocks of both the Andesite Porphyry unit and the Undivided Volcanic unit. These dykes contain medium- to coarse-grained phenocrysts of clear quartz and deep pink K-feldspar in a brownish aphanitic matrix. Quartz phenocrysts occur as doubly terminated ditrigonal prisms, characteristic of the high temperature polymorph. A few dykes in the vicinity of the showings seem to be intermediate in texture and composition to the two extreme types described above. Age relations of the different types are not known. Rhyolite dykes weather to a deep pink colour and near mineralized fractures surfaces are coated with hematite.

Hornblendite: A medium-grained, massive, dark green rock consisting essentially of amphibole crops out intermittently along linear mineralized belts. Origin of the rock is uncertain, but in the absence of directional textures it is considered igneous. The rock is consistently mineralized with sulphides — pyrite and chalcopyrite — that commonly amount to 5 to 10

percent (by volume) of the total composition. Locally sulphides are about 50 percent of the rock in which case they are highly weathered. In most places hornblendite is extensively weathered and has a colour ranging from deep yellow-brown to dark red-brown. Exposed surfaces and joint faces are covered with a thick coating of Fe oxides. Relict pyrite is generally much more abundant than is chalcopyrite. Sulphides occur as numerous minute blebs, generally 1 mm. or less in diameter, and more rarely as thin discontinuous veinlets.

Marble: Three small areas of outcrop of pale grey, metamorphosed, impure limestone occur in the area examined. These are located at the north end of the main gossan zone on the east side. There is some ambiguity as to the exact position of the main gossan zone relative to the northernmost limestone outcrops because of flattening of the topography and scarcity of outcrop. However, on aerial photographs a lineament that is a continuation of the main gossan zone continues for another 500 feet or more to the north beyond the limestone outcrops.

The marble consists mainly of fine-grained, sugary calcite with up to 10 percent pale green calc-silicate minerals. Sulphides occur very erratically as irregular blebs but were recognized in all three outcrops. Some joint surfaces are coated with a thin layer of malachite. Bedding was not observed.

Hydrothermal Alteration:

All rock types mentioned have been epidotized to some extent. Volcanic rocks are most extensively altered, particularly near mineralized

zones. Massive, yellow-green epidote (pistacite) occurs as small veins commonly about 1 inch or less in width, and rarely up to 3 inches in width. In any one outcrop as many as 6 orientations of epidote veins were recognized with no apparent preferred orientation throughout the general area. Commonly associated with epidote in these veinlets is an unknown, fine-grained, pink mineral. In a few samples chalcopyrite was found associated with epidote perhaps indicating that epidotization and sulphide mineralization are related genetically.

## MINERAL DEPOSITS

Sulphides of economic interest on the Fire group are chalcopyrite and pyrite. These seem to occur in definite mineralized zones marked by the following characteristics:

(1) linear ground trace,

(2) positions marked by pronounced lineaments on air photos,

(3) slight, but definite and fairly continuous, topographic depressions centred on mineralized zones,

(4) extensive weathering with the result that abundant gossan is present — mainly limonitic but with considerable hematite in places,

(5) absence of green copper stain except within a few hundred feet of marble outcrops — <u>despite</u> the presence of relict chalcopyrite in some highly weathered gossan,

(6) occurrence of mineralized hornblendite cropping out intermittently along mineralized zones.

Origin of these linear mineralized zones is uncertain due to extensive weathering and discontinuous outcrops along them. They may represent (1) dykes of hornblendite, (2) faults, or (3) both. Stripping and detailed mapping will be required to solve this problem.

Nature of occurrence of sulphides in hornblendite and marble has been outlined in a previous section. In addition, sulphides occur as anhedral blebs in volcanic rocks on both sides of the hornblendite zones, where they commonly constitute about 5 percent of the rock.

Because of discontinuous outcrops it is difficult to arrive at an exact width of the main mineralized zone. However, measured widths of about 50 feet of gossan containing relict sulphides are known along a length of about 1000 feet. In places iron stain in drift indicates widths of up to 100 feet.

Weathering has produced extensive gossan along the mineralized zones -- to a sufficient extent that it is difficult to obtain meaningful channel or chip samples. However, a grab sample of hornblendite containing about 8 to 10 percent sulphides was submitted for assay to obtain some idea of grade. Both pyrite and chalcopyrite were noted as extremely fine-grained blebs disseminated through the grab sample. The sample was tested for nickel with dimethyl glyoxime with negative results.

## CONCLUSIONS AND RECOMMENDATIONS

Although no reliable data are available as to grade of mineralized zones on the Fire group further work is highly desirable. Chalcopyrite is known intermittently along an extensive gossan zone more than 1000 feet long, 50 feet wide, with local widths potentially much greater. Mineralized zones have been extensively weathered and it is highly likely that much primary copper has been dissolved and removed by ground water.

In order to properly evaluate these showings some indication of true grade and true widths of the sulphide zones are required. Consequently,

top priority should be given to a trenching and sampling programme with several trenches oriented across the main gossan zone. For quickest results trenches could be located where the greatest proportion of outcrop occurs across the main mineralized zone.

Following the trenching programme detailed mapping on a scale of 1 inch equals 50 feet should be done to provide a basis for evaluating overall extent of the gossan zone and to provide a base map for future exploratory work should this be warranted. The area is ideal for rapid plane table mapping.

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