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PROPERTY FILE

QUALIFYING REPORT

ON

FRONTIER EXPLORATIONS LTD. (N.P.L.)

OWEN LAKE AREA

BRITISH COLUMBIA

BY

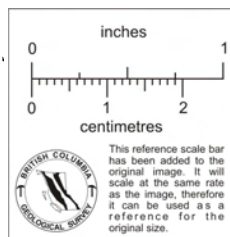
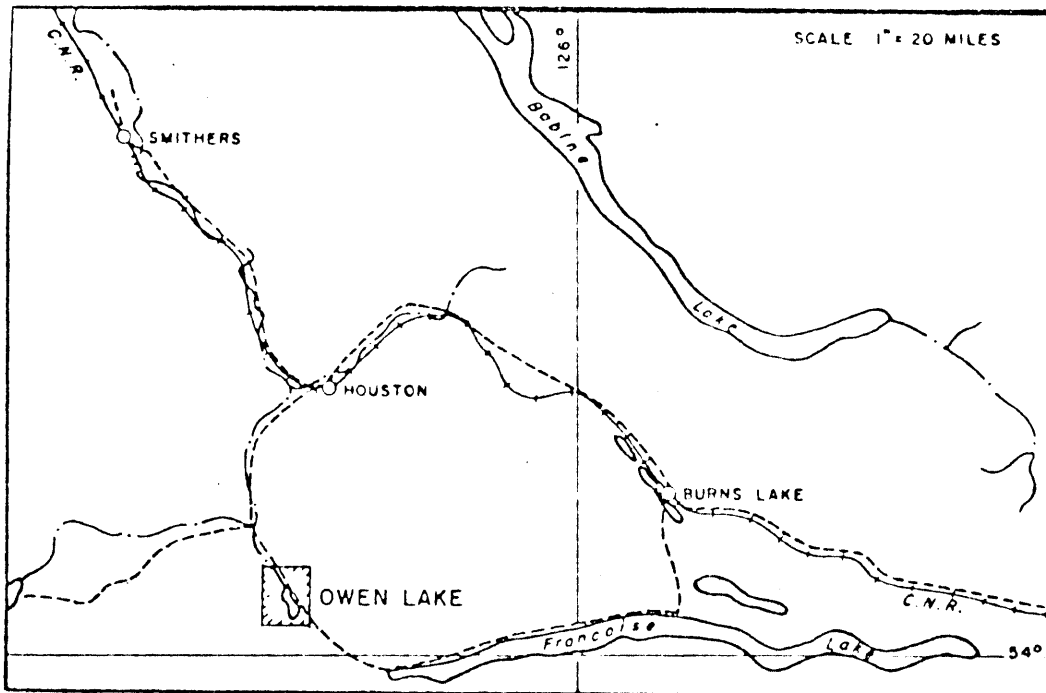
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NOVEMBER 14th, 1967

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SUMMARY

The lead-zinc-silver property of Frontier Explorations Ltd. is located near Owen Lake, about 27 miles by road south of Houston, a station of the C.N. Railway between Prince George and Prince Rupert, British Columbia. A one-mile truck road connects the property with the main highway.

The property consists of 15 full-sized mining claims and 6 fractions totalling approximately 950 acres. It has been explored by various companies since the discovery of the Cole lead-zinc-silver vein in 1915. The greatest period of activity was in 1928 when a shaft was sunk to 90 feet on the vein, and some 150 feet of drifting on one level. Little work was done until 1966 when the present owners, Frontier Explorations, carried out diamond drilling on previously discovered veins and stripping and trenching in the vicinity of the original Cole vein, where recent sampling disclosed a continuous vein averaging 2.8 feet wide for 600 feet in length averaging 0.2% copper, 2.8% zinc, 3.2% lead, 2.5 ozs. of silver per ton and 0.01 oz. of gold per ton. The indicated tonnage to a depth of 200 feet is about 33,000 tons containing recoverable values of around \$16.00 per ton.

A new and stronger vein structure has been uncovered in recent work off the end of the Cole vein that shows definite ore potential. It has been exposed in a north-south direction by stripping and bulldozer trenching for a distance of about 1,000 feet. It disappears under overburden at both ends. Preliminary sampling over an average width of 6.3 feet, for a length of 400 feet, grades 0.45% copper, 3.4% zinc, 3.3% lead, 8.8 ozs. of silver per ton and 0.013 oz. of gold per ton.

Summary (continued)....

The indicated tonnage to a depth of 200 feet is estimated at 160,000 tons containing recoverable metal values of \$29.70 per ton at present prices.

It is recommended that the new vein be explored further by diamond drilling to its limits and that unexplored portions of the property be explored in detail by geochemical and geophysical surveys followed by diamond drilling to search for additional veins. The total cost of the above program is estimated and \$50,000.00

INTRODUCTION

A total of three days, from October 23rd to October 25th, 1967, was spend on the property. During this time, bulk sampling was carried out on the Cole vein system, the results of exploration at adjoining properties were inspected and all information and reports on hand at the company's property were examined.

LOCATION AND ACCESS

The property is situated one mile north of Owen Lake, about 27 miles by gravel highway south of Houston, a station the Canadian National Railway between Prince George and Prince Rupert, latitude 54° 05'N., longitude 126° 45'W. An all-weather gravel road connects the Nadina Mining Company camp with the main Houston Road, and a farm road suitable for 4- wheel drive vehicles connects to the Frontier camp on Cole Lake, a distance of 1 mile.

TOPOGRAPHY AND WATER

The claims are located in rolling country with an average elevation of about 3,200 feet above sea level. They encompass two small lakes, George and Cole lakes, that lie at an elevation of 2,450 feet. There is ample water supply less than a mile away for any mining operation that might be envisioned at the property. Tailing disposal would offer no problem.

Most of the claim group is covered by natural open grass land used for cattle grazing. Outcrop is negligible and most of the surface mantled by unconsolidated glacial drift that is quite variable in depth composition. It ranges from a few feet to 150 feet over short distances across the prevalent glacial direction, northwest-southeast. The glaciers were alpine-type and changed direction rapidly on the mountain sidehill, giving an erratic distribution of overburden. The deeper gullies are filled with glacial clay, and the shallow ones with sand and gravel. Near Cole Lake, the overburden ranges up to 20 feet thick of sand and gravel over the veins.

CLIMATE

Climatic conditions are temperate. Winters are generally cold. Snowfall is moderate, usually between two and three feet.

PROPERTY

The property consists of 15 claims and 6 fractions totalling approximately 950 acres, as follows:

Property (Continued)....

## CLAIMS

<u>Name</u>	<u>Record No.</u>	<u>Assessment Work Filed to</u>
Diamond Bell	1684	July 2nd, 1971
Black Bear	1685	July 2nd, 1971
Ethel	7363	July 4th, 1971
Bell No. 1	24929	June 15th, 1969
Bell No. 2	24930	June 15th, 1969
Bell No. 3 Fraction	24931	June 15th, 1969
Bell No. 1 Fraction	24932	June 15th, 1969
Bell No. 2 Fraction	24933	June 15th, 1969
Bell No. 3 Fraction	24934	June 15th, 1969
Bell No. 4 Fraction	24935	June 15th, 1969
Bell No. 5 Fraction	24936	June 15th, 1969
Ivan Fraction	40867	June 20th, 1969
Van No. 1 Fraction	35244	Feb. 23rd, 1969
Van No. 1	35245	Feb. 23rd, 1969
Van No. 2	35246	Feb. 23rd, 1969
Van No. 3	35247	Feb. 23rd, 1969
Van No. 4	35248	Feb. 23rd, 1969
Van No. 5	35249	Feb. 23rd, 1969
Van No. 6	35250	Feb. 23rd, 1969
Van No. 7	35251	Feb. 23rd, 1969
Van No. 8	35252	Feb. 23rd, 1969
Van No. 9	35253	Feb. 23rd, 1969

HISTORY AND DEVELOPMENT

The property was first staked in 1915 by O.W. Jones, J.D. Cole and Frank Brown. Development work consisted of shallow stripping to 4 feet on the Cole veins system on the Diamond Belle group. Due to the inaccessibility at the time, nothing further was done. In 1923, a limited amount of surface work was carried out in the area by the the Owen Lake Mining and Development Company. A shaft was sunk on the Cole vein to a depth of 85 feet, and drifting east and west on the

History and Development (continued)....

vein for a total distance of 120 feet. This work established continuity of the vein at this depth, and both faces were in the vein when work was stopped. A.W. Lang made a detailed study of the geology of the district. In 1941, Canadian Explorations Ltd. optioned the Cole property and an examination was made by B.I. Nesbitt. Six short diamond drill holes totalling 663 feet were drilled and surface mapping and trenching carried out, mainly on the Cole Vein. Values encountered in the drilling were reported to be two low grade to be of interest at this time. In 1961, Dennison Mines Ltd. carried out detailed mapping, a self-potential survey and a geochemical survey over the west half of the claim group. Three new veins were exposed by a series of bulldozer trenches. Only low values in silver and gold were reported. In 1964, Frontier Explorations tested these veins by 4 short diamond drill holes totalling 608 feet. Several narrow veins containing values in silver, lead and zinc below ore grade were encountered. Work on the group was re-activated in 1967 by Frontier Explorations Ltd. in the area of the Cole shaft. The vein was completely uncovered for a distance of 640 feet in a northwest-southeast direction and thoroughly sampled. The shaft was retimbered and underground workings re-examined and sampled. A new higher grade north-south striking vein was exposed immediately to the southeast of the Cole Vein. It warrants additional detailed work by diamond drilling. A detailed geochemical survey was carried out by Kennco Explorations over a rectangular area, 3,000 feet by 1,000 feet, centred in the Cole shaft area. Several anomalous areas were outlined that warrant further investigation. Approximately



History and Development (Continued), . . . .

\$20,000.00 was expended by Frontier in the recent work. Additional detailed work is planned to further explore the new vein and the unexplored areas on the property.

GEOLOGY

The area lies 30 miles east of the Coast Range batholith. The area within a few miles of the property is underlain by andesite porphyry and associated rhyolite tuff breccia of the volcanic series. Overlying this is a group of Cretaceous argillite and greywacke. A late Cretaceous or Tertiary biotite granite stock intrudes the volcanic series on Nadina Mountain, four miles to the east. The Frontier property is underlain by a complex intrusive series, possibly a satellite of this stock that dips steeply to the east. The main feature is the presence of several large diabase dykes that intrude this series. Mineralization is usually associated with low temperature rhodochrosite veins containing quartz near the footwall of a later soda-trachyte porphyry dyke of smaller dimensions. The earliest member of the intrusive complex stock is classified as microdiorite. It is in the form of an irregular stock approximately  $1\frac{1}{2}$  miles in diameter. The veins are usually found in this rock and sometimes diabase itself. Small and large blocks of earlier volcanic rocks are enclosed by the microdiorite. It is largely altered to a soft, whitish rock over broad areas in the vicinity of the veins, and retains little of its original texture. The Cole vein system and the new vein are probably the result of differential pressures set up between

Geology (Continued)....

two rocks of different competency, such as the microdiorite and the soda-trachyte, near irregularities in their contact.

Ore minerals are mainly sphalerite, galena, pyrite, chalcopyrite with minor silver bearing tetrahedrite. Gangue minerals are mainly rhodochrosite and quartz with minor siderite. The veins are typically epithermal tension or shear structures. The Cole Vein strikes northwest-southeast and the shear vein north-south. Both dip steeply west. They are similar to veins developed underground on the adjoining Nadina property, 4,000 feet to the east.

ASSAY RESULTS AND GRADES

Five sub-parallel veins have been exposed on the west half of the property. The best vein development to date are the two veins of the Cole Vein system stripped and sampled recently.

The Cole shaft vein is well defined for a total length of 600-feet. It averages 2.8 feet in width and grades 0.2% copper, 2.8% zinc, 3.2% lead, 2.5 ozs. of silver per ton and 0.01 oz. of gold per ton. Recoverable values at present prices are about \$16.00 per ton, exclusive of freight on concentrates. It has a vertical extent of at least 100 feet. The northwest end dies out in the trachyte dyke; the southeast end disappears under heavy overburden and may extend further.

The new shear is defined on surface only for a strike length of 720 feet, and partially defined for an additional 280 feet, giving a total strike length of 1,000 feet. It is open on both ends where it strikes under heavy overburden. The average width of the shear

Assay Results and Grades (continued)....

zone itself is 15 feet. It has been partially sampled over an average width of 6.3 feet for a strike length of 400 feet and grades 0.45% copper, 3.4% zinc, 3.3% lead, 8.8 ozs. of silver to the ton and 0.013 oz. of gold per ton. Recoverable metal values at present prices are about \$30.00 per ton, exclusive of freight on concentrates.

CONCLUSIONS AND RECOMMENDATIONS

Recent work on the Frontier property has indicated the possibility of lead-zinc-silver ore shoots that require diamond drilling to define their limits. It may reasonably be assumed that the vein extends to a depth of 200 feet. A diamond drill test hole intersected the structure at a depth of 70 feet. The estimated tonnage to a depth of 200 feet is in the order of 160,000 tons. The presence of parallel veins and the extension of the present vein structure can be expected in the area. It is recommended that the following work be done to develop the present shear vein and to look for new ones:

Diamond Drilling (3,500 feet)	\$35,000.00
Geophysical & Geochemical Survey (20 miles)	5,400.00
Assaying	3,100.00
Supervision & Mapping	<u>6,500.00</u>
Total Expenditure	<u>\$50,000.00</u>

Conclusions and Recommendations (continued)....

Additional work recommendations will be contingent on the results of the above program. Further consideration will be given to testing the depth extension of the mineralization and to test any anomalies outlined by the geochemical and geophysical work.

Respectfully submitted,

Edward O. Chisholm, P. Eng.

CERTIFICATE

I, Edward O. Chisholm, of the City of Vancouver in the Province of British Columbia, hereby certify that:

- 1) I am a geologist with offices at 1349 West 32nd Avenue, Vancouver, B.C.
- 2) I am a graduate of the University of Toronto, Ontario, Master of Arts, 1945.
- 3) I am a member of the Professional Engineers of Ontario and British Columbia.
- 4) I have no direct interest or indirect interest in either the property or securities of Frontier Explorations Ltd., nor do I expect to receive any such interest.
- 5) This report is based on an examination of company records, maps and sections, and also on a visit to the property for several days in October, 1967.

Dated Vancouver, British Columbia,  
November 14th, 1967

Edward O. Chisholm, P. Eng.