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P. E. PETERSON, E. M.
MINING ENGINEER
955 THURLOW STREET
VANCOUVER, B. C.
1008 Stock Exchange Building
January 20, 1936.

014627

Alan N. Ker Esq.,
Managing Director,
Quesnelle Quartz Mining Co.,
Vancouver, B. C.

Dear Sir:

As per your request I am herewith submitting you summary report on the results of your mining development and the possibilities indicated; also recommendations as to future development together with estimates of plant and costs of the work involved. The development work since 1933 has been largely carried out in accordance to my recommendations. The results have been pretty much as expected.

In this report I am recommending work at depth as the next step in your mine development programme.

I am,

Very truly yours,

P. E. Peterson E. M.
P. E. Peterson, E.M.

PEP:F
Encl.

Summary Report On
THE MINING PROPERTY OF THE QUESNELLE QUARTZ MINING CO. LTD.

- By -

P. E. Peterson E.M.

Vancouver, B. C.
January 20, 1936.

Foreword:

Reference also can be had to my reports of October 24, 1933, June 18, 1934 and December 14, 1934, as these reports cover in considerably more detail some of the items that are only summarized here.

Property:

The property consists of 6 Crown Granted mineral claims having the total approximate acreage of 155.2. The Crown Grants on 5 of these mineral claims recognize the old principle of the extra lateral rights wherein the vein could be followed on its dip between the end lines, through the side lines to wherever it extended. Also the surface rights of these 5 mineral claims include the placer minerals as well as the lode minerals.

Location:

The property is situated on Hixon Creek in the Cariboo District, British Columbia. It is 46½ miles from the town of Quesnel, B. C.

History:

The Quesnelle Quartz Mine is one of the early mining locations of British Columbia. A small 5 stamp mill was erected on the property in 1878, and there is a record of production of gold bullion to the extent of \$4953.97. The total tonnage of ore milled was 239, from which there was recovered \$20.73 per ton. Just what the losses in the milling process were is hard to say, but it is likely that they were in the neighborhood of 20% to 30% of the gross value of the ore. In the year of 1886 or 1887 the late Mr. Amos Bowman M.E. visited the Quesnelle Quartz property for the Geographical Survey of Canada, reporting on the mine and the development work.

Hixon Creek was first worked for its placer gold in 1870. It is said that more than \$4,000,000 in placer gold came from this creek, and that some of the best placer workings on the creek were on the Company's present mineral locations. Placer mining operations are now being conducted on the bench gravels on the Company's properties.

Topography:

The country in general consists of low rising hills and of even and gentle slope. Along Hixon creek the hills rise for 400 or 500 feet on either side of the canyon. The elevation above sea level ranges from 2300 feet to 2700 feet.

Climate:

The average yearly precipitation is in the neighborhood of 36 inches. The average winter snowfall is approximately 188 inches. The summer temperature seldom rises above 80° F. and in the winter very seldom below 20° below zero. At Barkerville, a town in the same district, mining operations are carried on without interruption winter and summer.

PROPERTY FILE

Water:

Hixon Creek is a stream that runs the year round. There is ample water for all milling purposes, and there may be a possibility for a small power development further down the creek.

Timber:

The hills in the vicinity are covered with a second growth of jack pine, poplar, fir and spruce which range in size up to 8 inches in diameter, and would judge that there is here a supply of timber for mining purposes for some time to come. Timber suitable for mining is available throughout the entire district, so that in case it should become depleted in the vicinity of the claims it is still available from nearby sources.

Geology:

The country rocks of Hixon Creek are of pre Cambrian age consisting of grey quartzites, phyllites, quartz sericite, schists and greenstones. The greenstone is a fine grained and very much altered igneous rock, originally perhaps an andesite or basalt. The greenstones on the surface are in nearly all cases altered to red clay; the true nature of the rock being revealed only in the underground workings of the mine. On the Quesnelle Quartz mineral claims on the surface shows several bands of altered greenstone and schists; the schists being made up of quartz sericite and graphitic schists. The surface outcrops of the greenstones and the schists are striking approximately north 40° west, and appear to be dipping steeply to the northeast although underground on the 200 foot level of the main shaft contact between the greenstones and the schist is dipping approximately 58° to the southwest. I have observed three of these contacts between the schists and the greenstones on the Company's properties; and marking these contacts are quartz veins having the same strike and dip apparently as the actual contact between the greenstones and the schists. In the greenstones there is a multiplicity of small veins and stringers having a strike roughly at right angles to the course of the veins at the contacts. These veins are dipping both to the southeast and to the northwest at angles ranging from 60° to 85°. None of the quartz veins are found in the schists. All of them are on the contacts between the greenstones and schists or in the greenstones.

The greenstones are the host rocks of the gold bearing quartz veins. Alteration of these greenstones by oxidation has extended to a depth of over 100 feet. The gold in the numerous quartz veins and stringers has become disseminated and somewhat enriched by the secondary processes of oxidation.

The dissemination and enrichment of this gold from the veins throughout the greenstones has been of such extent, that all of the greenstones from the surface to a depth of 97 feet in the vicinity of the main shaft constitutes a large low grade ore body. The average values by careful channel sampling shows the gold content as follows:

Gold	.065	oz.	per ton
Silver	.25	oz.	per ton

With gold at \$35 an ounce and silver at 45¢ an ounce, this represents a gross value of \$2.38 per ton.

Veins:

The veins as observed on the No.4 level of the mine, which is 195 feet below the surface, were made up principally of quartz carrying medium amounts of pyrite, traces of chalcopyrite and galena, and possibly tetrahedrite. More than 25 of these veins have been exposed by development work. They are all in the greenstones or on

the contact between the schists and the greenstones. All of these veins carry values in gold, but are the richest at their intersections with other veins and with the veins along the schist greenstone contact. This is borne out by a study of the assay plan of the No.4 level, and it can now be confidentially predicted that the richer ore shoots of the mine are to be found along the intersections of these veins with each other along the schist greenstone contact. A short winze sunk on No.8 vein to a depth of 30 feet ~~in showed~~ average gold values of approximately \$15.00 per ton from the muck samples taken while the work was being done. This winze showed that as depth was gained below the No. 4 level ~~that~~ the ore shoot along the intersection with the contact vein increased in length.

Geological investigation of the surface shows another greenstone schist contact approximately 450 feet southwest of the main shaft. Along this contact there is a prominent quartz vein 4 or 5 feet in thickness. It is striking along with the contact, but dipping approximately 60° to the northeast in the direction of the contact exposed in the main shaft. The schist greenstone contact vein on the 195 foot level of the main shaft is dipping approximately 58° to the southwest in the direction of this other contact vein. Rough calculations indicate that perhaps at a depth of from 400 to 500 feet these two major veins traversing the schist greenstone contacts will intersect. This intersection of two major schist greenstone contact veins together with the numerous cross veins in the greenstones should produce a major ore body. This together with other evidence showing that ore shoots increase in length with depth as work progresses below the lower level, shows the necessity of further exploration at greater depth.

Future Development Programme:

The past development work in the Nos. 1, 2, 3 and 4 levels of the main shaft together with the work on the Koch shaft and Clarke tunnels and their extent are shown by the numerous maps and assay plans submitted with former reports.

The programme of mine development from now on should be confined exclusively to exploration at depth. The property should be equipped with plant of such a size ~~that~~ development with depth can be carried to 1000 feet.

The development work would be a new main shaft located in the greenstones southeast of the present shaft at such an elevation so as to provide good facilities for a waste dump. This shaft is to be a three compartment shaft with the two hoisting compartments 4 x 5 feet in the clear, the man way and pump compartment to be 5 x 5 feet in the clear. The first part of the programme would be to sink the shaft to a depth of 500 feet from the bottom running a cross cut to the schist greenstone contact to determine if sufficient depth has been obtained to reach the zone of intersection between the two main contact veins, and if the depth is sufficient then exploring the same along its strike for approximately 1800 feet. The main cross cut from the shaft to the contact may be approximately 400 feet in length. These exploratory cross cuts and tunnels should be ample to indicate the extent of ore occurrences at this new deeper horizon. Developments here on this level would then indicate the nature of the future development work. The important point in this projected development is to locate the ~~main~~ intersection zone of the two major contact veins, and it may be that preliminary cross cutting on the 500 foot level will indicate that the shaft is to be sunk deeper; so in preparing estimates I will assume the initial shaft to be sunk to a depth of say 600 feet.

Mining Plant:

This programme of deeper mine development will involve a new hoisting and compressor plant with the necessary buildings and gallows frame for the shaft. The present camp accommodations for the crew consisting of the cook house and dining room, the bunk house and office building will be sufficient for this new programme.

Estimated Costs:

Power Plant Machinery:

	<u>Wt. Lbs.</u>	<u>Price</u>
1 - 200 H.P. Deisel Engine with generator & switchboard	31,000	\$ 10,000.00
1 - Air compressor, capacity 650 cu. ft. free air per min. ;... ..	8,000	3,500.00
1 - 125 H.P. Motor with starter, Pully & Base	3,500	1,700.00
1 - Air receiver 42" x 96"	2,100	280.00
TOTAL	<u>44,600</u>	
R. R. Freight \$0.69 @ 100 lbs... ..		310.00
Truck Haulage \$8.00 (ton) 23 tons		184.00
Power house (30' x 40')		2400.00
Concrete Foundations..(20.cu. yds.(@ \$30)...		600.00
Installation Machinery		<u>300.00</u>
		<u><u>\$19,274.00</u></u>

Hoisting Plant:

1 - Electric Hoist Double drum speed 500 ft. per min.	24,000	\$ 6,000.00
2400 ft. 7/8" Dia. steel cable @ \$0.18 ft.	3,000	432.00
2 - Mine cages @ \$500.00	8,000	1,000.00
2 - 48" Sheave wheels	1,000	150.00
TOTAL	<u>36,000</u>	
R. R. Freight		248.00
Truck Haulage 18 tons.		144.00
Hoist House (20' x 30')		1,200.00
Concrete Foundations .10 cu..yds.@ \$30.00.		300.00
Installation Machinery		<u>150.00</u>
		<u><u>\$9,624.00</u></u>

Blacksmith Shop:

1 - Drill sharpener. 111	2,750	\$1,950.00
1 - 18" Oil fired drill furnace	600	265.00
	<u>3,350</u>	
R. R. Freight... ..		24.00
Truck Haulage... ..		22.00
Blacksmith shop building (15' x 20')		600.00
Concrete foundations: 2 cu. yds @ \$30.00 .		60.00
Installation Machinery		<u>60.00</u>
		<u><u>\$2,981.00</u></u>

Gallows Frame: Wood construction 35' high \$2,000.00

Mining Equipment:

	<u>Wt. Lbs.</u>	<u>Price</u>
6 - Rock drills complete with hose, tank & columns @. \$600.00	2,100	\$ 3,600.00
6 - Mining Cars @ \$135.00	7,200	810.00
4 - Tons drill steel 9½¢ lb. 11	8,000	760.00
24 - Tons of #12 Mine Rails @ \$40 ton ...	48,000	960.00
2000 ft. 3" air & water pipes @ 42¢ ft....	15,300	840.00
2400 ft. 2" air pipes @ 18.2¢ ft....	8,900	437.00
2400 ft. ¾" water pipes @ 6¢ ft... ..	2,700	144.00
1 - No.7 Sinking pump (80 gals. per min).	2,000	600.00
Station pump complete with motor 120 gals. per minute, 500 ft. head ..	<u>4,000</u>	1,500.00
	98,200	
R. R. Freight... ..		678.00
Truck Haulage... ..		393.00
		<u>\$10,722.00</u>

Summary Plant & Equipment Costs:

Power Plant	\$ 19,274.00
Hoisting Plant	9,624.00
Blacksmith shop	2,981.00
Gallows Frame, Mining Equipment & pumping plant	10,722.00
Allow 5% for unforeseen contingencies	2,130.00
For Engineering 5%	<u>2,130.00</u>
Total Equipment	<u>\$ 46,861.00</u>

Mine Development Costs:

3 Compartment timbered shaft, 600 ft. deep, 2 Hoisting compartments each 4' x 5' in clear Manway & pump compartment 5' x 5' in clear Size of excavation 17' x 6' cost @ \$50 ft. ..	\$ 30,000.00
2400 ft. of crosscutting & tunneling @ \$10.00 ft... ..	<u>24,000.00</u>
TOTAL	<u>\$ 54,000.00</u>

Total costs of Plant equipment & mine development program to depth of 600 ft.

Mine Development	\$ 54,000.00
Plant & Equipment	46,861.00
	<u>\$100,861.00</u>

The above estimated costs have been carefully considered, but it is expected that the present power plant equipment, mine buildings and small tools, and mine equipment will be made use of in this programme.

Additional Development Work:

To continue the development work to a depth of 1000 feet would require the sinking of the shaft an additional 400 feet, and the opening up of three additional mine levels, each involving approximately 2400 feet of crosscutting and tunnelling. The approximate expenditure for this additional programme will require another \$100,000.00.

Recommendations:

The above recommendations are based on the progressive study and the development of the Quesnelle Quartz Mines for over a period of three years. It has been found that the ore showings and ore shoots increase in size and importance as depth is gained. The Quesnelle Quartz Mine is located approximately 68 miles southeast of the Barkerville district where there are two profitable operating mines working in the exposed pre-Cambrian rocks of the district. In one of these properties, I have been informed by an Engineer who has made a careful study of ore bodies, that the ore values and the size of the ore shoots increased as development in depth progressed. The Hixon creek district is along the general line of strike on the ore bearing formations in the vicinity of Barkerville, and in general it is to be expected that conditions that prevail at Barkerville will also prevail on the Quesnelle Quartz property at Hixon Creek. On the Quesnelle Quartz mine the ore enrichment on the present shallow horizon is confined to vein and fissure intersections. As depth is obtained it is expected that the hot temperature zone in which the gold was deposited would gradually increase in size.

Milling Plant

The type of mill preferred is one using the cyanide process, wherein gold bullion is produced. The flow sheet could include recovery of gold by blankets and amalgamation, also the flotation process, the final gold recovery from the concentrate being made by the cyanide process.

There should be developed sufficient ore reserves to warrant a 200 ton mill. In this size of milling plant reasonable costs of treatment can be obtained.

The cost of a combination process cyanide plant is \$1200.00 per ton of installed capacity. A two hundred ton daily ore capacity mill will cost not more than \$240,000.00.

Conclusion:

The projected programme of development work I believe, is sufficient to show the possibilities of the mine.

The Quesnelle Quartz Mining Company's mineral claims are centrally located in the Hixon Creek area of pre-Cambrian rocks, and development work here will indicate the mining possibilities of the whole district.

In view of my past experience with this property I am of the opinion that this programme of mine development work as recommended will result in the opening up of large bodies of commercially valuable gold ores.

Respectfully submitted,

P. E. Peterson E.M.
P. E. Peterson E.M.,

Registered Professional Mining Engineer B.C.
Member Canadian Institute of Mining &
Metallurgy.

*Contradicted
See page 10
Peterson's
1933 report*

936/7E

P. E. PETERSON, E. M.
MINING ENGINEER
955 THURLOW STREET
VANCOUVER, B. C.
1008 Stock Exchange Building
December 14, 1934.

Newton J. Ker Esq.,
President,
Quesnelle Quartz Mining Co. Ltd.,
Vancouver, B. C.

Dear Sir:

In accordance with your request I have just completed an examination of your Company's mining properties situated on Hixon Creek, Cariboo District, British Columbia.

This report covers the progress of mine development since my last report of June 18, 1934. I left Vancouver on December 6th and returned on December 12th, spending three days on the property. Enclosed herewith is report of progress with my recommendations for further operations.

Very truly yours,

P. E. Peterson

P. E. Peterson E.M.,

PEP:F
Encl.

PROPERTY FILE

Report on the Mining Property of the
QUESNELLE QUARTZ MINING CO. LTD.

- by -

P. E. Peterson, E.M.

Vancouver, B.C.
December 14, 1934.

PREVIOUS RECOMMENDATIONS:

In my report of June 18, 1934 I had recommended that exploration work be carried out on the lowest level of the mine which is at a depth of 195'9" from the surface. The recommendations were that the contact between the greenstone and the schist should be explored in a northwesterly direction towards the old Koch, also that the main shaft be repaired and retimbered where necessary, and that a diesel engine operated electric pumping unit be installed for the purpose of economically handling the water. The shaft was to be equipped with skip or cage for hoisting ore and rock from the development work.

All of the recommendations as regards the installation of pumping plant, repair of shaft, building new head frame and hoisting equipment have been carried out. The development work done consists of 64'9" of a cross cut to the contact, and 90'8" of a drift along the contact in a northwesterly direction towards the Koch shaft.

PUMPING PLANT:

The pumping plant as installed consists of a 12 to 14 H.P. Petter Diesel engine which operates a $7\frac{1}{2}$ kilowatt, 220 volt, 3 phase alternating current generator. This generator furnishes the electrical energy for the operation of a 5 H.P. induction motor which drives by means of belt a 5" x 5" Bulldozer plunger pump. The motor and pump are located in the east crosscut on the lowest No.4 level. It is so arranged that it can be stopped and started from the engine room on the surface. The capacity of the pump is 50 gallons per minute, and it is only necessary to operate it for 10 hours of the 24. The $7\frac{1}{2}$ kilowatt generator is connected up to a transformer from which energy is obtained for electric lighting of the camp

and the shaft. A rough estimate of the cost of operating this pumping and lighting plant is less than \$1.00 per day, and since its installation no trouble of any kind has been experienced. In fact the plant is operated most efficiently.

HOISTING PLANT:

A new head frame over the shaft was constructed of 12 x 12 timbers. This frame is 27 feet high and contains a small ore bin of 3 or 4 cars capacity, and is so arranged that the skip is automatically dumped into the bin.

The ore skip consists of a bucket of 21 cubic feet capacity. It is attached to a cross head by chains. On the bottom level the ore cars are dumped directly into this bucket or skip. This hoisting plant entailed a minimum of capital expenditure and has proved a very satisfactory and economical operation. Credit must be given Mr. Ross and his crew at the mine for devising this most efficient ore hoisting arrangement.

NEW BUILDINGS:

New buildings include a garage 16' x 24', and a blacksmith shop 14' x 20' in cross section with a 7 foot lean to on one end for an oil filter.

In addition to the buildings there has been constructed a brick heating chamber. This surrounds a large wood stove and supplies hot air for heating the water tanks and the piping system. This brick chamber is well built and eliminates entirely any fire risk, and insures that even in the coldest weather operation of the plant will not be interfered with by the freezing of the water supply.

In addition to the buildings the Company has on hand approximately 100 cords of wood in storage for heating purposes.

VEINS, GEOLOGY & VALUES:

Drifting along the contact on the No.4, the lowest level of the mine has resulted in the finding of ore shoots, and thus far has confirmed entirely the expectations and conclusions as outlined in my former report of June 18, 1934. A copy of this report is attached hereto for the reason that these two reports must be considered together to give a complete picture of geology and possibilities.

X The contact between the greenstones and the schists is roughly a northwesterly direction and dips about 58° to the south. Along this contact which is a fault zone, there is a quartz vein varying from 2 to 6 inches in width, and paralleling this there is a gouge of clay about a foot in thickness. The drift and cross cuts have shown the presence of seven other veins in the greenstones which are striking roughly at right angles to the contact. These veins are in every instance cut off by the clay gouge at the contact, but also there is a decided enrichment in the values at the contact, which results in an ore shoot at the intersection which extends vertically to the surface and probably to considerable depth. One of these contacts at the intersection point of the quartz vein, revealed the presence of primary pyrites. A sample here showed values of 1.04 ounces in gold and 2.6 ounces in silver, giving a gross value of \$36.73 to the ton. Other intersections showed values ranging from \$1.50 to \$3.89 a ton; but in each case these other intersections were in the oxidized horizon wherein the values are very spotted and irregular; but very likely on a mill test would show a substantial average which might be in the neighborhood of \$20 judging by previous mill tests on this oxidized material.

RECOMMENDATIONS:

The important result of recent development work is that we have received proof and confirmation of our geological deductions. It has now been proved that the principal ore shoots on your property occur along the contact of the greenstones and the schists at the intersections of the veins at this contact. In every instance there has been an enrichment at the contact, and in one instance the values were \$36.73 in gold and silver, the principal values being in gold. From the evidence to date it is likely that some of these ore shoots at the vein intersections may not prove to be of very high grade, but I am inclined to the opinion that practically any one of these intersection point ore shoots along the contact will produce commercial ore, and especially so at a lower horizon below the oxidized zone. ~~The~~

The recommendations for future work is to continue drifting in a northwesterly direction along this contact to the workings under

the Koch and Clarke tunnels and beyond. Also the drifting should be continued in a southeasterly direction along this contact for several hundred feet. From the known veins exposed in the workings we can expect that this drifting along the contact will expose several more ore shoots. There is every reason to believe that in some of these veins intersected by the contacts, there will be ore shoots and enrichments that will extend for considerable distances away from the contact along the strike of the vein.

After drifting along the contact and exposing the ore shoots and sampling them, the next procedure would be to sink the shaft a further 150 feet and repeat the development programme on the new level; and if the results prove as favorable as now indicated there should be sufficient ore indicated and in sight to warrant the erection of a moderate sized mill.

CONCLUSION:

The work under the direction of Russel Ross has been carried out efficiently and economically. I consider that the money has been well spent and the results from mine developments to date have well justified the expenditures made.

Respectfully submitted,

P. E. Peterson E. M.

P. E. Peterson, E.M.,
Member of the Professional Engineers
of B. C.
Member of the Canadian Institute of
Mining & Metallurgy.



THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF MINES
RESIDENT ENGINEER'S OFFICE
HAZELTON

936/7E

BUREAU OF MINES
Office of Prov. Mineralogist
REC'D DEC 18 1933
Rec'd. *Personally*

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Dec. 13th 1933.

John D. Galloway, Esq.,
Provincial Mineralogist,
VICTORIA, B.C.

Dear Sir,

re Quesnelle Quartz Mining Co., Ltd.

I have just received from Mr Newton J. Ker, President of this company, copy of a very full report on this property, dated Oct. 24th, 1933, by Mr P.E. Peterson.

The report runs to 13 pages of single-spaced foolscap sheets, and I therefore venture to summarize it for you, thinking that you may care to have it before the Preliminary Report goes to press, and I send forward the full report thinking that perhaps Mr Richmond would care to read it as I understand he is compiling a report on this district. Will you kindly ask Mr Richmond to return this report to me as soon as possible?

Summary of Mr Peterson's Report.

Geology. Schisted sediments are interstratified with greenstones. In the greenstones is a multiplicity of small veins and stringers having a strike roughly at right angles to the strike of quartz veins which parallel the contacts with schists and greenstones. The greenstones are the mineral-bearing rocks; oxidation in these extends to a depth of over 100 feet as disclosed by workings of main shaft. The unoxidized greenstone at bottom of shaft shows low but persistent gold and silver values, while the oxidized greenstone contains from five to six times more gold and silver, indicating that in the oxidized zone of the greenstone secondary enrichment of the gold has taken place.

Workings. (Main shaft and workings therefrom) Certain old shafts and workings caved and inaccessible except one tunnel

Main Shaft - total depth including 12ft sump - 207ft 9 ins.

First level-depth 50ft 3 ins. below collar-extent 26.5ft

Second Level-depth 97ft 7 ins. below collar-

total length of tunnels-232 feet.

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PROPERTY FILE

by this property is altered greenstone (total area is 155.2 acres) alteration extending to a depth of 100 feet, then ~~assuming~~ there are approximately 28 million tons of ore of a value of \$2.04 per ton in gold and silver. Development is warranted to define limits of altered greenstone zones and to determine with accuracy average values. By open-cut mining methods and steam shovels, it is estimated that mining and milling costs (including tailings losses) might amount to \$1.23 per ton.

Recommendations. All other old workings to be unwatered and systematically sampled, followed by diamond drilling. If satisfactory results secured installation of 50 ton per pilot-mill recommended for further check on sampling and also to indicate best method of ore treatment.

This ends summary of Mr Peterson's Report.

In connection with this property, I think, the determination of the greenstone, whether volcanic or intrusive is of some considerable importance, and I should be very glad to hear your views on sample submitted, and also whether a thin section could be made if necessary. Possibly Mr Richmond from field examination will be able to throw valuable light on this subject. I might add that this company is now running a tunnel in the right creek bank, opposite main shaft, to test I am, (the ground further.

Yours faithfully,

D. Lay.

Resident Engineer.

to \$274.00 to the ton. Apparently the last work done on the Quesnelle Quartz Property prior to the inspection in 1886 by Mr. Bowman, was under the superintendence of Mr. George Koch. Mr. Bowman makes a statement that the lack of continuity in the ore bodies found near the surface and the smallness of the rich cross stringers has been baffling. There are old records showing 2½ tons of ore sent to the Government mill at Barkerville that returned \$37.50 per ton.

80 tons milled at the mine returned \$16.58 per ton.
 2 tons milled at the mine returned 45.75 per ton.
 35 tons milled at the mine returned 33.12 per ton.
 119½ tons milled at the mine returned 19.53 per ton.

The total tonnage milled is 239 which averaged \$20.73 per ton, and the total bullion recovered from all the ore was \$4953.97. Of the early milling practise it is stated that no concentrate was saved, and the suggestion is made that the recovery of the gold content was low. Since 1886 all of the shafts have been full of water, and practically no development work has been done on the property since that date up until the present time.

In 1897 Mr. Carlisle, Provincial mineralogist for the Province of British Columbia is said to have visited the property, and definitely stated that the schists of the Cariboo series were auriferous after he had made his examination of the Quesnelle Quartz Mining Company's property on Hixon Creek, and expressed himself favorably as to the formation here, likening the schist zone cut by numerous stringers and veins, to that of the Homestake Mine of the Blackhills of South Dakota.

TOPOGRAPHY:

The country in general consists of low rising hills of even and gentle slope. Along Hixon Creek the hills rise 400 or 500 feet on either side of the canyon. The elevation above sea level ranges from 2300 to 2700 feet.

CLIMATE:

The climate here is very similar to that of Barkerville with the exception that the average temperature is slightly higher due to the lower elevation, and the winter snowfall is probably somewhat less than at Barkerville. The following records for Barkerville are copied from Memoir 149, Canada Geological Survey.

CLIMATIC CONDITIONS AND WATER SUPPLY

Records of climatic observations at Barkerville are available from 1888 to 1924

Reports of Meteorological Service of Canada, Toronto, Ont.

Mean Temperature at Barkerville, 1888-1915 (Degrees F.)

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yr.
6.4	19.2	26.1	34.8	44.4	50.1	54.4	53.7	45.5	37.7	25.3	20.9	35.7

The temperature rarely rises above 80 degrees or falls below 20 degrees and in some years these extremes are not reached.

Mean Precipitation at Barkerville, 1888-1923 (Inches)

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yr.
.37	2.51	2.40	2.11	2.56	3.49	3.25	3.21	3.51	3.18	3.45	3.34	36.4

(2)

Third Level - depth 145ft 6 ins.-extent two tunnels
total length 81ft 6 ins.

Fourth Level- depth 195ft 9 ins. - extent two tunnels
total length 240 feet.

Sampling. All workings on the four levels thoroughly sampled. Channel samples were taken brest high at every five foot interval along sides and faces of all tunnels (Note: the length of tunnel which each sample represents is not stated) Samples represent a fair average value of entire workings. All quartz veins were sampled separately in addition to the channel samples.

In all 216 channel samples were taken, and in addition 18 samples were taken of the quartz veins. The former were assayed by G.S. Eldridge & Co., the latter by J.R. Williams & Son.

Values. Values are based on gold @ \$30.00 per ounce, and on Silver @ 35 cents per ounce.

Fourth Level: Assays- per ton.
Average of 95 samples: Gold, 0.0164 ozs; silver, 0.069ozs
Total value - \$0.51 per ton.

Third Level:
Average of 31 samples: Gold, 0.034 ozs; silver, 0.207 ozs.
Total value - \$1.10 per ton.

Second Level: Rocks on this level are schisted sediments and greenstones.

Average of 46 samples in schisted sediments only showed conclusively that commercial values do not exist in these rocks, and indicated a total value of \$0.28 per ton only.

On the other hand, 40 samples cut from tunnels in greenstones showed an average assay of: Gold, 0.072 ozs; silver, 0.225 ozs per ton, giving a total value of : \$2.24 per ton.

First Level:
Average of 10 samples all in greenstone gave an ~~average~~ assay of: Gold, 0.036 ozs.; silver, 0.344 ozs.
Total value: \$1.20 per ton.

Average of all samples on First, Second and Third levels in greenstone - \$1.66 per ton in gold and silver values.

Average of first and second levels representing depth of 97ft 7ins in the greenstone - \$2.04 per ton in gold and silver values.

Commercial Possibilities. Assuming that half the area covered

Report on

THE MINING PROPERTY OF THE QUESNELLE QUARTZ MINING COMPANY LTD.

By

P. E. Peterson, E.M.

Vancouver, B. C.
October 24, 1933.

PROPERTY:

The property consists of 6 Crown Granted mineral claims which are as follows:

Morrison	location	Lot 52	approximate acreage	20.7
Stewart	location	Lot 53	approximate acreage	20.7
Washburn	location	Lot 54	approximate acreage	20.7
Mineral claim		Lot 55-G	approximate acreage	20.7
Mineral claim		Lot 56-G	approximate acreage	20.7
Washburn	lateral	Lot 9545	approximate acreage	51.7
		Total acreage	approximately	155.2

The mineral claims from Lot 52 to Lot 56 inclusive are old locations; the Crown Grants carry the date of 1884 and conveyed the said lands and all minerals precious and base, excepting coal which may be found therein. These Crown Grants recognize the old principle of extra lateral rights wherein the vein could be followed on its dip between the end lines through the side lines to wherever it extended. The Washburn lateral, Lot 9545 is a more recent location, and does not convey the title to the surface placer, nor does it allow any extra lateral rights, in other words on this claim the veins cannot be followed on their dip beyond the boundaries.

LOCATION:

This property is situated on Hixon Creek, Cariboo district, British Columbia. It is 46½ miles from the town of Quesnel and 48 miles from the town of Prince George by the automobile road, and it is approximately 12 miles by wagon road from Woodpecker Island Landing on the west bank of the Fraser River.

Hixon Creek is a tributary of Government Creek which flows into Canyon Creek, which in turn flows into the Fraser River.

HISTORY:

Hixon Creek was first worked for its gold in the 1870's, the early boom days of the Cariboo gold rush. It is said that more than \$4,000,000 came from it. According to one report the largest nugget ever found in British Columbia was recovered from Hixon Creek; its value in gold was \$700.00. Later some development work was done on quartz veins that were uncovered during placer operations, and about the year of 1878 a small 5 stamp mill was erected.

In the year of 1886 or 1887 the late Mr. Amos Bowman M.E., made a report on the Quesnelle Quartz Property for the Geological Survey of Canada. He reports the main shaft as being 200 feet deep, the Mason shaft several hundred feet north of it at the base of the hill as 40 feet deep, and the Koch shaft as being 70 feet deep, and three more or less crooked prospecting tunnels that had been run northwestward into the hill searching for a continuous body of ore. He speaks of the Washburn ledge having a strike of north 46° west and a dip to the northeast of 70° with a slate country rock, the ore body being from a few inches to six feet in width. The small cross veins striking northeast and standing vertical contain the richer ores. Of the ore mineral he speaks of iron pyrites and grey copper and their decomposition products with free gold. He also mentioned some assays taken by various parties ranging from \$28.00

The precipitation in 1908, the wettest recorded year, was 49.54 inches; the precipitation in 1896, the driest, was 20.61 inches. The year 1917 to 1922 inclusive were exceptionally wet, the precipitation each year being over 40 inches and averaging 43.35 inches. They were preceded by a long series of relatively dry years interrupted by an occasional wet year. In only four years during the period from 1888 to 1916 did the precipitation exceed 40 inches. The precipitation in 1923 was 36.68 inches or very nearly the average for thirty-six years. The average winter's snowfall is 188 inches. It varies greatly from year to year. In the winter of 1904-05 it was only 97 inches; in the winters of 1916-17 it was 258.3 inches.

WATER:

Hixon Creek is a stream of water that runs the year round, and I would judge its flow to vary from perhaps five second feet during low water to a maximum of forty second feet during high water. There is ample water for the milling of ores, but no considerable amount of power could be developed although there are some possibilities in this respect.

TIMBER:

The hills in the vicinity are covered with a second growth of jack pine, poplar, fir and spruce which range in size up to 8 inches in diameter, and would judge that there is here a supply of timber for mining purposes for some time to come. Timber suitable for mining is available throughout the entire district, so that in case it should become depleted in the vicinity of the claims it is still available from nearby sources.

GEOLOGY:

The country rocks of Hixon Creek are grey quartzites, phyllites, quartz sericite, schists and greenstones, the greenstones apparently interbedded with the sediments. The greenstone is a fine grained and very much altered igneous rock, originally perhaps an andesite or basalt. These rocks on the surface are in nearly all cases altered to red clay. On the Quesnelle Quartz Mineral claims there are several bands of greenstones and schists. These greenstones and schists are striking approximately north 40° west and appear to be dipping quite steeply to the northeast. I have observed three of these contacts between the schist and the greenstone on the Company's properties, and marking these contacts are quartz veins having the same strike and dip apparently as the actual contact between the greenstones and the schists. In the greenstones there is a multiplicity of small veins and stringers having a strike roughly at right angles to the course of the veins at the contacts. These stringers dip from 60° to 85° southeast or in some cases to the northwest. I did not observe any of the quartz veins passing into the schists. The greenstones are the mineral bearing rocks.

Alteration of the greenstones by oxidization has extended to a depth of over 100 feet as revealed by the workings in the main shaft. The unoxidized greenstone in the bottom workings of the mine, show low but persistent gold and silver values, while the oxidized and altered greenstones in the upper levels of the mine show considerably higher values, containing in fact from five to six times more gold and silver indicating that in the oxidized zone of the greenstone secondary enrichment of gold has taken place. In fact it seems to be the only way to account for the enriched values in the oxidized greenstone zones. Manganese dioxide is present in the greenstones. This mineral when in combination with common salt reacts liberating chlorine which dissolves the gold and which is again precipitated in the greenstone by pyrites or other reducing substances or minerals, and thus probably is the manner in which the gold has been carried downward into the greenstones and brought about an enriched oxidized zone which seems to extend to a depth of about 150 feet.

VEINS:

The veins as observed on the 195 foot level of the mine were made up principally of quartz carrying medium amounts of pyrite, traces of chalcopyrite and galena and possible tetrhedrite. Contrary to all expectations these veins did not prove to be high grade, in fact the highest assay in gold obtained by myself was 0.12 ounces per ton. However the veins all carry gold, and it was observed that the greenstone on the walls of these quartz veins, was considerably silicified for some distance and was mineralized to some extent with pyrite. The large number of these quartz vein intrusions even with their low grade gold values is ample to account for the gold that by the processes of secondary enrichment formed the enriched ore bodies in the oxidized zones of the greenstone. Erosion in this section undoubtedly has been several thousand feet, and when considering the enormous quantities of greenstones that have been subjected to these processes of leaching and precipitation, it is easy to realize and account for not only the oxidized zones of enrichment in the greenstone but placer deposits as well.

Near the surface of the oxidized zone some of these quartz veins have been found with pockets of spectacular free gold content. It is from these pockets that the ore for the mill was obtained, and as noted in the historical paragraph, the actual production of gold from these high grade bunches in the veins has been \$4953.97.

When considering the upper portion of the oxidized zone in the greenstones, I would expect that the richest portion would probably be confined from the surface down to perhaps 20 feet. Actual evidence shows that the ore zone to this depth has produced bunches of high grade free gold ores, and perhaps most of the production that came from the mill was from the zone extending down to a depth of not greater than fifty feet.

MINE WORKINGS:

Mine workings consist of the main shaft with four levels. The first level at a distance of 50 feet 3 inches from the collar of the shaft consists of one tunnel 26 feet 6 inches long. The No.2 level which is 97 feet 7 inches below the collar of the shaft is fairly extensive, and it has a number of tunnels which have total lengths of 232 feet. The No.3 level having a depth of 145 feet 6 inches from the collar of the shaft has two tunnels totalling in length 81 feet 6 inches. The No.4 is the lowest level and is at a depth of 195 feet 9 inches from the collar of the shaft. This level has two tunnels, their total lengths are 240 feet. Below the lowest level there is a sump 12 feet. The main shaft with its sump is 207 feet 9 inches in depth, and the total of all the workings on the four levels is 580 feet. This main shaft has been mapped and the plan of the workings is enclosed herewith.

The rest of the workings on the property are at the present time caved in and not accessable. The extent of these workings is not definitely known. The old workings consist of a Mason shaft now completely caved in, which is said to have been 40 feet deep. A short distance west of this Mason shaft is the Koch shaft which is said to be 70 feet deep, and from the bottom of this shaft there is said to be a tunnel 174 feet long. Near the collar of the Koch shaft which has been sunk at the foot of the hill, there is a tunnel driven in a northwesterly direction which is said to be several hundred feet long with its various cross-cuts. From the Koch shaft about 600 to 800 feet there is an old shaft on the Stewart location which has been sunk on the quartz vein on the contact between the greenstone and the schist. This shaft is partially caved and full of water, and the extent of the workings is not fully known. Continuing another 800 feet or so in a southwesterly direction from the shaft of the Stewart location there is another tunnel on the Morrison location driven in a northwesterly direction in the greenstones near the schist

contact. At this contact on the Morrison location is a well defined quartz vein. This vein where exposed is 7 feet wide. The extent of the workings in this tunnel on the Morrison location are not known.

IMPROVEMENTS IN SURFACE PLANT:

The compressor and hoist house located at the collar of the main shaft is a building 20' x 32' with 14 foot walls. In this building is a dry and wash room approximately 8' x 10'. The machinery consists of one P.V.2 oil engine driven 2 stage air compressor direct connected to a 50 H.P. Carrol Ingersol-Rand type P.O. oil engine. This oil engine compressor is equipped complete with a starting unit consisting of a small novo gasoline engine and air compressor with high pressure air receiver. The air compressor has a piston displacement of 322 cubic feet of free air per minute. In connection with the water supply for cooling water for both air compressor and deisel engine, there are two circulating water tanks in the compressor building and a main storage water tank having a capacity of 216 cubic feet of water which is located 22 feet above the roof of the power house and also above the other buildings.

The hoisting engine is a single drum mine hoist driven by an 18 H.P. novo gasoline engine. There is 250 feet of $\frac{1}{2}$ inch wire rope on the ground. There is also a hand operated winch of 5 tons capacity. With this hand winch there is 110 feet of $\frac{7}{16}$ inch wire rope.

The pumping equipment consists of one No.3 Cameron sinking pump, capacity 25 gallons per minute. The mine equipment consists of one H. 75 Ingersol-Rand drifter, one Jack hammer type S 49, two mine columns, one column arm and clamp.

The blacksmith shop is located in an old log cabin and consists of an anvil, forge and the usual tools for hand sharpening, drill steel.

Miscellaneous equipment: One 10 ton Jack, set of stocks and dies, complete set of carpenters tools. There is 100 feet of air hose, 700 feet of 2 inch pipe, 200 feet of $\frac{3}{4}$ inch pipe and 400 feet of $\frac{7}{16}$ inch steel cable.

For transporting the supplies there is a $1\frac{1}{2}$ ton Dodge truck with dual wheels.

CAMP BUILDINGS:

The office building is 20' x 24' with a 7 foot wall, having three rooms, one of which is used for the office and two are bedrooms. There is a wash room with running water and a shower bath.

The main bunk house is 24' x 30' with a 7 foot wall. It is large enough to accommodate 20 men and has a sink with running water.

The cook house is 20' x 40' with an 8 foot wall.

The dining room and kitchen are 20' x 30'. There is a bedroom 10' x 10' and a pantry 10' x 10'. Located at the back of the pantry there is a root cellar 8' x 10'.

There is one old log cabin 14' x 18' situated near the Koch shaft. This building is in good repair and is being used for oil and gasoline storage.

FUEL:

At the time of my visit there was fully 100 cords of wood cut for winter fuel, also there was in storage 32 drums of diesel oil, 4 drums of gasoline, and 2 drums of lubricating oil.

For the purpose of fire protection there is 200 feet of fire hose. This is sufficient to reach most of the buildings.

SAMPLING AND ASSAY PLANS:

All of the workings in the main shaft on the four levels have been thoroughly sampled. A channel sample was taken breast high at every five foot interval along the sides and the faces of all tunnels and drifts. The samples were carefully taken and should represent a fair average value of the entire workings. All of the quartz veins were sampled separately in addition to the channel samples. There was nothing left unsampled in the workings of the main shaft levels. The assay plan submitted herewith shows the workings and the location of each sample taken.

The following is a number of each sample taken, and also its gold and silver assay. The assaying was done by G. S. Eldridge & Co. of Vancouver. The original certificates of assays are enclosed with the original copy of this report. Gold was calculated at the value of \$30 per ounce.

Marked	<u>GOLD</u>		<u>SILVER</u>	
	Oz. per ton	Value Per Ton	Oz. Per Ton	
Level 195'9"	1.	0.02	\$0.60	0.20
	2.	0.01	0.30	0.24
	3.	Trace		Trace
	4.	0.005	0.15	Trace
	5.	0.01	0.30	Trace
	6.	0.005	0.15	Trace
	7.	Trace		0.14
	8.	Trace		Trace
	9.	0.01	0.30	0.14
	10.	0.01	0.30	Trace
	11.	0.01	0.30	0.06
	12.	0.01	0.30	0.28
	13.	Trace		Trace
	14.	0.005	0.15	Trace
	15.	Trace		Trace
	16.	Trace		Trace
	17.	0.01	0.30	0.16
	18.	0.01	0.30	0.14
	19.	0.02	0.60	0.05
	20.	0.04	1.20	0.05
	21.	0.01	0.30	Trace
	22.	Trace		Trace
	23.	0.02	0.60	0.04
	24.	0.01	0.30	0.08
	25.	0.01	0.30	0.30
	26.	0.04	1.20	0.10
	27.	0.01	0.30	Trace
	28.	0.01	0.30	0.20
	29.	0.01	0.30	0.05
	30.	0.005	0.15	Trace
	31.	0.01	0.30	Trace
	32.	Trace		Trace
	33.	0.005	0.15	Trace
	34.	0.01	0.30	Trace
	35.	0.02	0.60	0.08
	36.	0.26	7.80	0.20
	37.	0.01	0.30	0.24
	38.	0.005	0.15	0.04
	39.	Trace		Trace
	40.	0.02	0.60	Trace
	41.	0.005	0.15	Trace
	42.	0.005	0.15	0.10
	43.	0.005	0.15	0.08
	44.	0.04	1.20	0.16
	45.	0.005	0.15	Trace
	46.	Trace		Trace
	47.	Trace		Trace
	48.	0.01	0.30	0.16

Marked	<u>GOLD</u>		<u>SILVER</u>
	Oz. Per Ton	Value Per Ton	Oz. Per Ton
Level 195'9"	49.	0.06 \$ 1.80	0.26
	50.	0.01 0.30	0.12
	51.	0.01 0.30	trace
	52.	trace	trace
	53.	0.01 0.30	trace
	54.	0.01 0.30	trace
	55.	0.005 0.15	trace
	56.	+ 0.01 3.00	0.18
	57.	0.03 0.90	0.05
	58.	0.05 1.50	0.10
	59.	0.04 1.20	0.06
	60.	0.01 0.30	0.04
	61.	0.01 0.30	0.06
	62.	0.04 1.20	0.18
	63.	0.02 0.60	0.12
	64.	0.005 0.15	trace
	65.	0.005 0.15	0.06
	66.	0.02 0.60	0.14
	67.	0.01 0.30	0.18
	68.	0.02 0.60	0.10
	69.	0.05 1.50	0.10
	70.	0.01 0.30	0.10
	71.	0.07 2.10	0.26
	72.	0.005 0.15	trace
	73.	0.005 0.15	trace
	74.	0.01 0.30	trace
	75.	0.02 0.60	0.06
	76.	0.01 0.30	0.08
	77.	trace	trace
	78.	trace	trace
	79.	0.01 0.30	0.06
	80.	0.04 1.20	0.06
	81.	0.01 0.30	trace
	82.	trace	trace
	83.	trace	trace
	84.	0.02 0.60	trace
	85.	trace	trace
	86.	0.01 0.30	trace
	87.	0.01 0.30	0.30
	88.	0.01 0.30	0.06
	89.	0.005 0.15	trace
	90.	0.01 0.30	0.10
	91.	0.01 0.30	0.16
	92.	0.02 0.60	trace
	93.	0.01 0.30	0.28
	94.	0.02 0.60	trace
	95.	0.02 0.60	trace
Level 145'6"	96.	0.12 3.60	1.5
	97.	0.19 5.70	0.54
	98.	0.03 0.90	0.94
	99.	0.01 0.30	trace
	100.	0.04 1.20	0.10
	101.	0.02 0.60	0.16
	102.	0.01 0.30	0.06
	103.	0.04 1.20	0.10
	104.	0.03 0.90	0.14
	105.	0.06 1.80	0.22
	106.	0.02 0.60	0.18
	107.	0.07 2.10	0.40
	108.	0.05 1.50	0.32
	109.	0.02 0.60	0.08
	110.	trace	trace
	111.	0.02 0.60	0.16
	112.	trace	0.08
	113.	0.03 0.90	0.10
	114.	0.01 0.30	0.10
	115.	0.05 1.50	0.18

Marked	GOLD		SILVER	
	Oz. Per Ton	Value Per Ton	Oz. Per Ton	
Level 145'6"	116.	0.01	0.30	0.26
	117.	0.07	2.10	0.10
	118.	0.01	0.30	0.16
	119.	0.03	0.90	0.16
	120.	0.01	0.30	0.24
	121.	0.02	0.60	0.18
	122.	0.01	0.30	0.04
	123.	0.005	0.15	0.12
	124.	0.02	0.06	0.10
	125.	0.03	0.90	0.26
	126.	0.04	1.20	0.16
	Level 50'3"	127.	0.03	0.90
128.		0.04	1.20	0.58
129.		0.06	1.80	0.32
130.		0.05	1.50	0.58
131.		0.02	0.06	0.34
132.		0.01	0.30	0.06
133.		0.04	1.20	0.42
134.		0.09	2.70	0.62
135.		0.01	0.30	trace
136.		0.01	0.30	0.18
Level 97'7"	137.	0.26	7.80	0.22
	138.	0.16	5.40	0.36
	139.	0.06	1.80	0.24
	140.	0.06	1.80	0.10
	141.	0.05	1.50	0.12
	142.	0.03	0.90	0.22
	143.	0.05	1.50	0.34
	144.	0.07	2.10	0.16
	145.	0.03	0.90	0.08
	146.	0.05	1.50	0.12
	147.	0.01	0.30	0.10
	148.	0.06	1.80	0.10
	149.	0.03	0.90	0.24
	150.	0.05	1.50	0.14
	151.	0.01	0.30	0.06
	152.	0.05	1.50	0.24
	153.	0.38	11.40	0.62
	154.	0.04	1.20	0.18
	155.	0.26	7.80	0.50
	156.	0.45	13.50	0.62
	157.	0.05	1.50	0.28
	158.	0.04	1.20	0.18
	159.	0.01	0.30	0.26
	160.	0.02	0.60	0.20
	161.	0.05	1.50	0.44
	162.	0.02	0.60	0.18
	163.	0.04	1.20	0.48
	164.	0.02	0.60	0.14
	165.	0.02	0.60	0.10
	166.	0.01	0.30	trace
	167.	0.01	0.30	0.06
	168.	0.07	2.10	0.16
	169.	0.07	2.10	0.28
	170.	trace		0.30
	171.	0.01	0.30	0.06
	172.	trace		0.20
173.	0.01	0.30	0.24	
174.	0.01	0.30	0.28	
175.	trace		trace	
176.	trace		0.08	
177.	0.005	0.15	0.26	
178.	0.01	0.30	0.18	
179.	0.01	0.30	trace	
180.	trace		0.14	
181.	0.01	0.30	0.14	
182.	0.01	0.30	0.06	
183.	0.14	4.20	0.12	
184.				

Marked.	GOLD		SILVER	
	Oz. Per Ton	Value Per Ton	Oz. Per Ton	
Level 97'7"	185.	0.01	0.30	trace
	186.	0.01	0.30	trace
	187.	0.09	2.70	0.38
	188.	0.04	1.20	0.18
	189.	0.03	0.90	0.20
	190.	0.01	0.30	0.20
	191.	0.005	0.15	trace
	192.	0.02	0.60	trace
	193.	0.01	0.30	trace
	194.	trace		trace
	195.	trace		trace
	196.	trace		0.01
	197.	0.005	0.15	0.10
	198.	0.005	0.15	trace
	199.	0.005	0.15	trace
	200.	0.005	0.15	trace
	201.	0.01	0.30	trace
	202.	0.01	0.30	trace
	203.	0.005	0.15	0.08
	204.	trace		trace
	205.	0.01	0.30	trace
	206.	0.01	0.30	trace
	207.	trace		trace
	208.	0.01	0.30	0.10
	209.	0.01	0.30	0.14
	210.	0.01	0.30	trace
	211.	0.02	0.60	trace
	212.	0.005	0.15	0.24
	213.	trace		trace
	214.	0.02	0.60	0.10
	215.	0.02	0.60	0.28
	216.	0.01	0.30	trace

The following are assays of the quartz veins. These samples were assayed by J. R. Williams & Son, and the gold was calculated at \$32.00 an ounce.

Mark	Gold Ozs.	Value @ \$32.00
CARIBOO		
C. No.1	0.01	0.32
C. No.2	Nil	Nil
C. No.3	Trace	----
C. No.4	0.04	1.28
C. No.5	0.03	0.96
C. No.6	0.015	0.48
C. No.7	0.02	0.64
C. No.8	0.01	0.32
C. No.10	0.06	1.92
C. No.11	0.05	1.60
C. No.12	0.02	0.64
C. No.13	0.12	3.84
C. No.14	0.01	0.32
C. No.15	0.01	0.32
C. No.16	Trace	-----
C. No.17	Trace	-----
C. No.18	Nil	Nil

ORE VALUES

Fourth Level: On the fourth, the lowest level of the main shaft the workings are all unaltered greenstone. The average of 95 channel samples covering all of the tunnels on this level show gold .0164 ounces to the ton, and silver .069 ounces to the ton. At \$30 an ounce for gold, this level will average \$0.49, and with silver at \$0.35 an ounce, there is \$0.02 in silver to the ton, giving a total gold and silver value of \$0.51 to the ton.

At intervals as shown on the assay plan there are a few places where higher assays were obtained, but this did not represent any well defined zone or vein. The assay values on this level are too low to be of any commercial value. On the third, which is the 145 foot level, the general average of 31 channel samples is gold .034 ounces, and silver .207 ounces to the ton. With gold at \$30 an ounce and silver at \$0.35 an ounce, the average of this level shows gold \$1.03 and silver \$0.07 making a total gold and silver value of \$1.10 per ton.

Third Level: Referring to the assay plan on the third level, it is to be noted that there is a well defined silicified zone 10 feet wide which when taken along will average .108 ounces of gold to the ton, and at \$30 an ounce shows a value of \$3.24. However the continuation of this zone is not shown on the fourth level below, but there is a possibility that it may be found there, although it should have been found in the north drift on the fourth level.

Second Level: The rocks on the second level are schists and oxidized greenstones. Sampling of the tunnels in the schist area showed very low values. The average of 46 channel samples is gold .0087 ounces and silver .064 ounces to the ton. With gold at \$30 an ounce and silver at \$0.35 an ounce, the gold value is \$0.26 and silver of \$0.28 to the ton. This sampling shows conclusively that commercial values do not exist in the schist rocks.

The 40 channel samples cut from the tunnels in the greenstones on the second level showed an average gold content of .072 ounces and a silver content of .225 ounces to the ton. With gold at \$30.00 an ounce and silver at \$0.35 an ounce, the gold value is \$2.16 and the silver is \$0.08 giving a total of gold and silver values at \$2.24 to the ton.

First Level: The 10 channel samples on this level which are all in the greenstone showed an average gold content .036 ounces and .344 ounces of silver to the ton. With gold at \$30 an ounce and silver at \$0.35 an ounce, the gold value is \$1.08 and the silver \$0.12 giving a total gold and silver value of \$1.20 to the ton.

Averages: The average of all the channel samples in the greenstones on the first, second and third levels show a gold content of .053 ounces, and a silver content of 0.23 ounces to the ton. With gold at \$30 and silver at \$0.35 an ounce, the gold value is \$1.59 and the silver value is \$0.07, and the total average of gold and silver values for the first, second and third levels is \$1.66 to the ton. The sampling shows that the altered greenstone zones to a depth of 145 feet 6 inches carry sufficient gold and silver values to be classed as commercial ore.

The average of the first and second levels in the greenstones which represents a depth of 97 feet 7 inches from the surface, shows a gold content of .065 ounces and silver 0.25 ounces, which with gold at \$30 and silver at \$0.35 an ounce shows a gold value of \$1.95 and a silver value of \$0.09, giving a total gold and silver value of \$2.04 to the ton.

The average values of these two upper levels are 18½ per cent higher than the average of the three levels, thus showing the values decrease with depth, and proving that the ore zone in the greenstone has been caused by secondary enrichment.

INDICATED ORE TONNAGE POSSIBILITIES:

The development work on surface out-crops shows alternate bands of schist and greenstone dipping at steep angles and striking in a northwesterly direction. The width of the schist and the greenstone zones have not been defined. There are at least three bands of greenstone and possibly more on the Quesnelle Quartz Property. The widths of these zones are unknown, but it is possible that the total of the several zones may represent half of the area of the mineral claims. There are six mineral claims having a total area of approximately 155.2 acres. If for the sake of indicating somewhat the possibilities, it is assumed that half of this area is altered greenstones, then there are 77.6 acres that have a depth of approximately 100 feet and contain values of \$2.04 in gold and silver to the ton. The tonnage represented in 77.6 acres to a depth of 100 feet is approximately 28,000,000 tons. The probabilities of being able to work such an enormous tonnage of ore at a profit makes this a mining proposition that deserves serious consideration. Development work is warranted to define the limits of the altered greenstone ore zones and to determine with accuracy the average gold and silver values.

ECONOMIC POSSIBILITIES:

The mining of the altered schist ore zones on the Quesnelle Quartz Properties would be by open cut mining methods using steam shovels or diesel engine or motor driven shovels. The cost of this type of mining varies from \$0.15 to \$0.25 a ton. On page 692 of Peele's Mining Engineers' Handbook, is a table giving costs of steam shovel mining of several mines ranging over a period of three years. These costs show a variation from \$0.1242 to as high as \$0.2370 per ton of ore mined, and includes the cost of stripping the overburden.

The probable cost of milling is difficult to determine until metallurgical tests are made of the ores to determine the type of treatment required. A good example of the cost of milling low grade gold ores is the operation of the old Alaska Treadwell Mining Company. Their operating costs are given on pages 1301 - 1304 of Robert Peele's Mining Engineers' Handbook for the year 1912. Briefly summarized the data is as follows:

Approximate daily tonnage	2440
Cost of mining developing, & stoping	\$0.3520
Cost of milling, treating concentrate & bullion charges	0.3027
Cost of construction, overhead & other expenses	0.0671
Total cost is	\$1.2218

The values recovered from the ore were \$2.47

These Alaska Treadwell costs of approximately \$0.30 a ton for milling may be too low to apply to the Quesnelle Quartz ores, but it would seem reasonable to expect milling costs of at least \$0.75 a ton or under.

For the purpose of illustrating possibilities of the treatment of this ore, assuming that a large tonnage can be blocked out having an average value of \$2.24, which is that actually shown in the sampling of the No.1 and No.2 levels in the main shaft.

Estimated Costs & Profits

Ore.....	\$2.24
Less cost of mining.....	0.25
" " " milling.....	0.75
" 10% mill losses.....	0.23
Indicated net profit.....	\$1.01

RECOMMENDATIONS:

In view of the great possibilities indicated by the sampling of the workings of the main shaft, I recommend that the old tunnel on the Morrison location be opened up, and also the Koch tunnel and the Koch shaft be unwatered. When this is done these workings should be thoroughly channel sampled in the same manner in which workings of the main shaft were sampled. Samples taken out of the altered greenstone areas are to be kept separate from those samples taken in the schist. If the results of this additional sampling should prove similar values as found in the main shaft, then I recommend that the property be systematically diamond drilled for the purpose of defining the widths of the altered greenstone rocks and the schists, and also for the purpose of sampling and proving ore tonnage in the altered greenstones.

Metallurgical tests should be made on a composite from rejects of samples No. 127 to 170 inclusive and samples No. 187, 188, and 189, and 213, 214 and 215. A single composite of all these samples can be used for the purpose of making the tests which should indicate the character of treatment required for this ore.

In the event of successful results from diamond drilling and sampling recommended, then I would recommend the installation of a pilot mill of 50 tons daily capacity for the purpose of definitely checking the mine sampling and proving conclusively the method of ore treatment.

After these recommendations are carried out it will then be possible to determine with accuracy the actual profits that may develop from this mining enterprise.

There is a possibility that better values than now shown may be encountered at depth in the greenstones, and it would be interesting and might prove worth while to drill the bottom of the main shaft by a couple of diamond drill holes in the greenstones to a depth of 800 feet.

CONCLUSION:

The examination and sampling of this property definitely indicates the possibilities of a very large tonnage of commercially profitable gold ore. The cost of carrying out the recommendations is not excessive, and it is possible with moderate additional expense to get the information that may prove the Quesnelle Quartz Mining Company to be one of the world's great low grade gold mining propositions.

Respectfully submitted,

P. E. Peterson E.M.

P. E. Peterson, E.M.,

Member of the Professional Engineers of B. C.

Member of the Canadian Institute of
Mining & Metallurgy.

936/4E

P. E. PETERSON, E. M.

Mining Engineer

File

May 5, 1937.

Newton J. Ker, Esq.,
President,
Quesnelle Quartz Mining Co. Ltd.,
Vancouver, B. C.

Dear Sir:

Acting upon your instructions as per your letter of April 1, 1937, I have made an examination of your Company's mines situated on Hixon Creek, Cariboo District, British Columbia.

I arrived at the mine April 6th, and remained there till April 8th, examining in detail all of the recent mine workings.

The results of the recent development work continue favorable, and I am outlining in this report recommendations for your guidance.

I am,

Very truly yours,

P. E. Peterson E. M.

P. E. PETERSON, E. M.

Registered Professional Engineer.

PROPERTY FILE

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PEP/F

Encl.

NEWTON J. KER,
PRESIDENT

ROBERT BERRY,
SECY-TREASURER

936/7E

QUESNELLE QUARTZ MINING CO. LTD.
(NON-PERSONAL LIABILITY)

M-1253
/se

LOCATION OF MINE
HIXON CREEK, B. C.

REGISTERED OFFICE
1000 HALL BUILDING
789 PENDER STREET WEST

TELEPHONE: SEV. 2027

RECEIVED
AUG 17 1936

VANCOUVER, B. C.

MINISTER OF MINES

August 14th 1936.

Honorable Minister of Mines,
Parliament Bldgs.,
Victoria, B. C.

Dear Sir:-

As a consequence of a recent letter from the Minister of Mines to Miller, Court & Manley, Ltd., in connection with certain literature being issued about the Quesnelle Quartz development, our attention has been called to the fact that certain engineers' reports have not been filed with your department.

One report by P. E. Peterson, M.E., dated October 24th 1933, was filed with Mr. Douglas Lay, as resident engineer at Hazelton, but apparently subsequent reports by him and by Mr. W. G. Norrie-Loewenthal, M.E., have not been.

We are therefore sending under separate cover certified copies as follows:

1. Report by P. E. Peterson, October 24th, 1933.
2. Report by P. E. Peterson, June 18th, 1934.
3. Report by P. E. Peterson, December 14th, 1934.
4. Report by P. E. Peterson, January 20th, 1936.
5. Report by W. G. Norrie-Loewenthal, July 16th, 1935.

Yours truly,

Newton J. Ker
President.

Progress Report on the Mining Properties of the

QUESNELLE QUARTZ MINING CO. LTD.

-By-

P. E. Peterson, E. M.

Vancouver, B.C.
May 5, 1937.

REFERENCE:

This report does not cover in detail all phases of the property, and for complete detailed information I refer you to my reports of October 24, 1933, June 18, 1934, December 14, 1934, January 20, 1936, April 6, 1936, July 7, 1936 and my report of October 7, 1936. The above mentioned reports cover in detail all phases of your property, and it will be unnecessary to repeat this information herewith.

DEVELOPMENT WORK:

Since the date of my report of October 7, 1936, the development work in the mine has been confined to sinking the winze from the No. 5 level which is 300 feet below the surface, to the No. 6 level at a depth of 400 feet below the surface. Below the No. 6 level the shaft was continued 34 feet deeper to provide for an ore pocket and a sump for water drainage. From this lowest level, 260 feet of cross cutting has been done for the purpose of locating the downward continuations of the ore zones, and determining the present position of the greenstone schist contact.

The mine development on the present lowest No. 6 level is 200 feet below the zone of oxidation, and therefore the ore opened up on this level is undoubtedly of primary origin. The development work to date has proved the ore zone to extend to a depth of 400 feet below the surface to the bottom of the present workings, and the indications are that the ore zones will continue downward, possibly to considerable depth.

SAMPLING AND ORE VALUES:

Attached hereto is a composite plan of the Nos. 4, 5, and 6 levels, together with a sectional view showing the winze from the No. 4 to the No. 6 levels on which is shown the ore cut by cross cuts and thus far developed. Also there is a separate assay plan of the No. 6 level showing the location of

PROPERTY FILE

samples and their number. The mine development and sampling has been carried out in accordance to my recommendations, under the direction of Russell Ross the Superintendent. Referring to the sectional view it is seen that the winze has continued in ore from the 200 foot to the 300 foot level, at which point the winze passes through the ore zone continuing down to one side of it and passing through another zone of mineralization at a depth of from 360 to 370 feet. The ore zone was located by cross cutting in an easterly direction from the 400 foot level on the east side of the well defined foot wall slip which is also the foot wall of the ore body on the 300 foot level.

The ore followed by the winze from the 200 foot to the 300 foot levels had an average width of 45 inches, and an average gold content of .48 ounces per ton, and silver 2.08 ounces per ton, totalling \$17.74 per ton. On the 300 foot level drifting along the ore for a distance of 30 feet showed an indicated width of almost 15 feet with assays ranging from a few cents to \$20.28. The average value of this ore drifted on the 300 foot level was in the neighborhood of \$6.00. On the lowest No. 6 level 400 feet deep, the ore zone is shown by samples No. 1018 and No. 1019. Sample No. 1018 across 5 feet is Gold .09 ounces per ton, Silver .04 ounces per ton. Value \$3.17. Sample No. 1019 is Gold .84 ounces per ton, Silver .92 ounces per ton, Value \$29.81. The average value across the width of 10 feet is \$16.49. To summarize the values as shown on the present sinking, drifting and cross cutting; the first 100 feet below the 200 foot level showed values of \$17.74. Drifting and cross cutting on the 300 foot level showed \$6.00 values. Cross cutting on the 400 foot level, the present bottom of the mine, shows \$16.49. The results as shown by this work indicate satisfactory average values. In addition to this principal ore zone which has been previously designated No. 8 vein, the sinking of the winze has found mineralization extending for a distance of 10 feet between the depths of 60 and 70 feet below the 300 foot level. This mineralization indicates another ore zone which seems to be striking N. 30° W. and dipping 60° to the East. Samples Nos. 921A, 922A, 924A, 925A, 927A, 928A are taken from this location. These samples assay as follows:

921A	Gold	.02 oz.	Silver	.04 oz.	Value	\$.72
922A	Gold	.38 oz.	Silver	.12 oz.	"	13.35
924A	Gold	.76 oz.	Silver	.14 oz.	"	26.66
925A	Gold	.05 oz.	Silver	.06 oz.	"	1.78
927A	Gold	.05 oz.	Silver	.02 oz.	"	1.76
928A	Gold	.90 oz.	Silver	.20 oz.	"	31.59

Samples 922A, 925A, 928A were taken along the strike of the zone, and show an average value of \$15.57. Samples 921A, 924A, 927A are samples each 5 feet wide across the zone and show an average value of \$11.87. This latter figure as being across the zone is the more reliable valuation. The downward extension of this zone is indicated in a cross cut, and its probable location is that shown upon the assay plan by sample No. 1014. This sample assays .11 ounces Gold, .68 ounces Silver, Value \$4.16 across the width of 5 feet. Referring again to the sectional view of the assay plan, it is noticed that the crosscut has passed through another zone at the location of the sample No. 1031. This sample across the width of 5 feet goes Gold .23 ounces, Silver .08 ounces, Value \$8.09.

GEOLOGY:

The ore zones as shown on the sectional view are located below the zone of oxidation in greenstones and in close proximity to their contact with graphitic and sericite schists. These greenstones are ancient volcanic rocks which have been altered and metamorphosed, but close examination shows these rocks to have been probably basalt and diabase which have been intruded by other porphyritic rocks. These greenstones are similar in type to the host rocks of many of our successful Canadian gold producing mines. The gold values occur in silicified greenstones associated with pyrite and arsenopyrite, and occasional traces of galena, and sphalerite. The ore zone as shown on the 300 and 400 foot levels is well defined on the foot wall side by a small fault plane. The hanging wall seems to be indefinite, and it is difficult to distinguish the ore zone from the wall rock.

ORE TONNAGE & ESTIMATES:

The development work now shows that commercial ore extends for a depth of 200 feet to the bottom of the mine from the 200 to the 400 foot levels. The width of this ore varies from 4 to 10 feet; it being 45 inches wide from the 200 foot to the 300 foot levels, about 15 feet wide on the 300 foot level, and 10 feet wide on the 400 foot level. As far as the work has gone the ore values are of a satisfactory commercial grade. However considerable more work will be necessary before it is advisable to present any definite figures on ore tonnage.

It will be necessary to drift on the ore zones to determine their length and average values, and in order that the ore may be considered blocked out, it will be necessary to raise along the ore zone from one level to the other. However, taking into consideration the satisfactory results to date it seems as if future good development results should continue.

RECOMMENDATIONS:

The present cross cut from the No. 6 or 400 foot level should be continued in its present direction which is S. 80° E., for at least another hundred feet. I expect that this cross cut which has already cut two ore zones will encounter others as well. After the cross cut is completed, then drifting should be started in a southerly direction along the ore zone No. 8 until the greenstone schist contact is reached. Other ore zones that may be encountered should be drifted on in the same direction towards the contact. Previous work has shown these ore zones to be richest at their intersection at the greenstone schist contact. After the first stage of drifting towards the contact has been completed, then drifting into the greenstones in a northerly direction along the ore zones is to be continued. If this work should continue in ore as expected, then a raise should be driven along the ore in the No. 6 level to the No. 5 level. Assuming that this development work will prove satisfactory values and continuity of the ore, then I recommend that a new main shaft be put in by raising from the 400 foot level to the surface in a suitable location in the non-ore bearing schists. A good location for the main shaft is on the hillside approximately 200 feet southeast of the present main shaft.

I expect that these ore zones in the greenstones will persist to considerable depth, and for their economical exploration at depth it will be necessary to have a new shaft of 3 compartments properly equipped with the necessary hoisting engines and surface plant.

I recommend that a competent Surveyor be engaged to make a survey of the Company's underground workings and prepare a map of the same. This is quite important now. Heretofore we had depended upon compass surveys, but as the workings are becoming more extensive these compass surveys are no longer sufficiently accurate to use with confidence in direction the development work.

CONCLUSION:

The results of the development work on the lowest No. 6 level 400 feet below the surface have been satisfactory and encouraging, and I am in hopes that drifting along the ore zones will soon put in sight sufficient ore to warrant the erection of a mill.

Respectfully submitted,

P. E. Peterson E.M.

P. E. PETERSON, E.M.

Member of Professional Engineers of
British Columbia,
Member of the Canadian Institute of
Mining & Metallurgy.

936/4E

PROPERTY FILE

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R E P O R T
on the
P R O P E R T Y
of the

QUESNELLE QUARTZ MINING COMPANY LTD.

Hixon Creek

CARIBOO DISTRICT, B. C.

by

W. G. NORRIE-LOEWENTHAL

Mining Engineer.

VANCOUVER, B. C.

July, 1935.

16th July, 1935.

Newton J. Ker, Esqre.,
President,
Quesnelle Quartz Mining Company Limited,
Vancouver, B. C.

Dear Sir:-

In accordance with your instructions I made an examination of the property of the Quesnelle Quartz Mining Company, situated on Hixon Creek, in the Cariboo District of British Columbia.

The property having been previously sampled by Mr. P.E. Peterson, M.E., and your staff at the mine, only the new work was sampled under my direction during this examination, this included about 160 feet of drifting on the No. 4 level, where channel samples were cut on both sides of the drift and a detailed sampling was made of all the prominent veins cut by the drift.

A brunton compass survey was made of the lower level and of the No. 2 level, and two new plans attached to this report, show the workings in general, and in detail as far as the 4th level is concerned.

Inasmuch as Mr. Peterson made a detailed report on the property for you in October 1933, together with two supplementary reports during the year 1934, I do not believe it will serve any useful purpose, at this time, to include a detailed description of all the different features, such as History, Climate, Property, etc., in this report, which is chiefly intended to bring out certain geological and structural features, disclosed by the recent development, and to make recommendations for exploratory work.

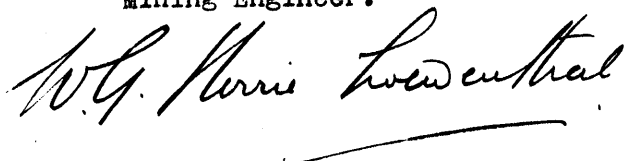
Your superintendent, Mr. Russell Ross has carried out the work entrusted to him in an exceptionally able and conscientious manner.

I trust the attached will be of some service to you.

Yours respectfully,

Signed - W. G. Norrie Loewenthal.

Mining Engineer.



GEOLOGY

The section of country embraced by the claims and beyond their boundaries to the North East and South West, or up and down Hixon Creek, is in most places covered with a thick mantel of Glacial drift and gravels, so that out-crops of the rocks are few and far between. The geology as disclosed by the few outcrops of rock on the surface, and the underground workings, consists of several bands of highly altered grey and black slates, locally called schists, interbedded with which are alternating bands of greyish green rock, locally termed Greenstones, this latter rock may be of ingenous origin in which case it is probably an altered andesite or Tuff, however, on account of the banded structure noticed in hand specimens, there is some ground for believing that this rock may be of sedimentary origin, but now so considerably altered that its original composition is difficult of determination. To clear up this point specimens have been sent to the department of Mines at Ottawa for Petrographic study, and pending receipt of a report from the department, the current name (Greenstone) and origin of the rock is assumed. On the Number 4 level the first 350 feet of the recent workings to the North West, passes through this characteristic Greenstone, the last hundred feet of the drift however, shows a different character of rock, which has the appearance of Limestone and shows effervescence with the application of acid. This last hundred feet of drifting while it intersects some Quartz veins, has shown very little free Gold but occasionally some wire silver is obtained from vug holes in the Quartz, the assays in this section show an almost entire absence of Gold, so that the change in the character of the rock may have accounted for this.

The general line of strike of the formation at Hixon Creek corresponds very closely with that in the Barkerville district and it is just possible that the formation here belongs to the Pleasant Valley section of the Cariboo Series, this formation has been classified by the Geological survey of Canada as being of Pre-Cambrian age (see Memoir No. 149). This view is strengthened by the lithological character of the rocks at Hixon Creek and in the similarity of formation structure, also by the fact that the vein occurrences in Hixon Creek bear a remarkable resemblance to those in the Barkerville district.

Inasmuch as the geological survey of Canada have not made a detailed survey of the Hixon Creek area, the above theory must be taken for what it is worth, but pending such a survey it may be used as a basis from which to carry out exploratory work, and the results obtained in the Barkerville area, notably at the Island Mountain and Cariboo Gold Quartz mines, may be used for purposes of comparison on the Quesnelle Quartz property.

VEIN SYSTEM:

The major development work performed on the property, both

by the old timers and the present operators, has been confined to prospecting one of the several contacts between the Schists and Greenstones. The particular contact on which most of the work has been concentrated is the one in the immediate vicinity of the three shafts; and particular attention has been directed to the section North Westerly from the Main shaft, probably because it is in that direction that the surface outcrops of rock and quartz veins are most prominent.

The placer deposit on the creek itself has been worked by the old placer miners, and within recent years a big pit on the left or north West side of the creek, was excavated by hydraulic methods, exposing the bedrock in what is known as the Briscoe Pit. The bedrock itself is a bright red color and the original rock structure has been obliterated, by oxidation, this oxidation extends downwards a distance of between twenty-five and fifty feet and as this oxidised area includes within itself the decomposition products of the veins as well as the country rock, there is some grounds for believing that the whole of it may be of economic value, especially if the price of gold should be advanced.

In the course of drifting along the contact North Westerly along what was assumed to be the main vein, numerous cross veins were cut through. These veins are Quartz filled fissures, and show an average North Easterly strike, the veins vary in width from a few inches up to five feet. From the present development, it would appear that these cross veins are in the main confined to the Greenstone rocks, as they appear to terminate at the contact of these rocks with the schists. As to whether all of the veins will behave in this manner is by no means certain, as it was noticed that at least one of them, viz. on the Koch tunnel, passed into the Schists. It is possible, therefore, that by following the more prominent of these cross veins, they will be found to pass into the Schists. However, whether they pass into the Schists or not, they will have the greater economic value in the Greenstone rocks, as the latter is a type of rock which is much more easily fractured than the Schists.

These cross veins were noted on every level where work was done in the mine, and on the 4th level, which is the most recent development, in all 27 veins were intersected. These veins have been numbered tentatively in order to facilitate their exploration. Reference to the large scale map accompanying this report shows the relationship of some of these veins recently cut, and those in the old workings. Particular attention is directed to Nos. 8, 11 and 12 veins on the 4th level, two of which, viz. Nos. 8 and 12, showed values on the 4th level, these are quite possibly the same as the three veins which were drifted on by the early operators in the Mason workings. In Mr. Koch's old report he mentions that this working showed 10 cross veins and that four of them were drifted on, also that it was from these veins that most of the ore which was put through the old mill was obtained. The old plan of the Mason workings shows that one

of these veins was followed for a distance of 56 feet South Westerly when it hit the schist contact, and the others for a distance of 50 feet North Easterly, presumably this drifting was all in Greenstone, thus the continuity of several of these cross-veins has been proven for a distance of over 100 feet from the contact, and if the ones opened on the 4th level are the same as those on the Mason works, then at least three of these veins have been proven to a depth of 200 feet below the surface. Additional evidence supporting this theory is supplied by the veins opened up on the second level, and the probable correlation between the large vein there and the No. 2 vein on the 4th level. In this case attractive values were shown on sampling the vein on the 2nd level, but only low grade material was found on the 4th, however in the case of the latter only one point of the vein was sampled, whereas in the case of the 2nd level, the vein is exposed by drifting and cross-cutting over a distance of 50 feet North Easterly from the contact.

Three veins on the 4th level drift, appear to be correlated with exposures on the old North West crosscut, from the shaft, these are Nos. 3, 7 and 8. In all three of these ore indications appear either in the drift or in the crosscut.

From evidence of the development to date therefore, both from the old workings and the new, it would appear that some of these veins, at least the more prominent, have continuity both along the strike and in depth, and the limiting factor so far as economic value is concerned, will probably be the width of the particular Greenstone band which is being developed. An attempt was made to determine this latter point from surface indications, but the covering of wash extended beyond the boundaries of the property and the best that can be said at this time is that over 100 feet of width is exposed under-ground at present.

Having some years ago examined the Pinkerton and Saunders groups, (now the property of the Cariboo Gold Quartz Mining Company) in the Barkerville district, also the showings on Yanks Peak, the writer was struck with the resemblance of the vein structure on the Quesnelle Quartz property with those referred to. In the case of the Barkerville and Yanks Peak occurrences, there are two sets of veins, termed the A and the B. The A veins strike North Westerly parallel with the formation and constitute a conspicuous feature of the area, and it was on these veins that the bulk of the work performed by the old timers was concentrated, in their search for the Mother Lode of the Placer Gold, as a rule these veins do not contain ore of economic value. The B veins intersect and cross the A veins striking North Easterly and dipping steeply, they are relatively insignificant features, but they have been proven, by the operations at Island Mountain and by the Cariboo Gold Quartz Company to be the main source of the Gold occurrences. In his report on the Cariboo Gold Quartz property to the Government of B. C., in the year 1931, Mr. J. D. Galloway, the then

provincial mineralogist, referred as follows to the B veins. "They pinch and swell in short distances along the strike, ranging in width from a few inches up to 10 feet. In places the veins stringer with Pyritised Schist lying between the stringers, the principal mineralisation is a massive Pyrite. The Gold content is proportional to the sulphides and whenever pure Quartz is obtained showing no sulphides, no Gold values are obtained." This description of the B veins by Mr. Galloway is most apt and in the writer's opinion correctly describes the situation in the Barkerville district, and most probably in the Hixon Creek area as well.

In both cases placer deposits were found on the creeks, in the case of Hixon Creek it is reported that \$4,000,000.00 was secured by the early operators, and hydraulic operations are being conducted today. It has been fairly definitely determined that the placer Gold originated from the decomposition of the formation containing the B veins, and that the richer the placer Gold, the better prospects there were for obtaining rich Lode Gold in the formation underlying the gravels.

Applying the above to the Quesnelle Quartz Company's property the headings which have been driven along the contact of the Greenstones and Schists, particularly the drift on the No. 4 level, have followed an A vein, two others of which, viz. that exposed by an old shallow shaft sunk 540 feet down Hixon Creek below the Main shaft, and the Morrison showing, are of the same type. The veins which tend North Easterly from these North Westerly workings are B veins, and some of them may be of economic value, therefore these are the veins on which future development should be concentrated. It is possible that the richest portions of these veins are at their point of contact with the A veins, as is sometimes the case in the Barkerville occurrences, but there is nothing definite about this, and the Quesnelle Quartz experience has been rather to the contrary, vide the showing on No. 2 level.

MINE WORKINGS

The mine has been explored to date by three shafts and two tunnels, situated on both sides of Hixon Creek. Of these workings the Mason shaft, and what is now known as the Koch tunnel, were run in the very early days, while the Koch shaft and North Western drift therefrom was run in the year 1886. These workings are referred to in the Manager's (Koch) report for that year. The Mason shaft and workings are situated 180 feet North Westerly from the present Main shaft, and according to the Manager's report of April 20th, 1886, this shaft was 50 feet deep and had a drift extended 88 feet South Easterly or towards the main shaft. As these old workings appear to have an important bearing on the veins opened up recently on the 4th level, I quote from Mr. Koch's report as follows - "ten quartz veins were cut through, on two of which were cross drifts, fifty-one feet in length, all that work being done to the North East and in Vein Porphyry (Greenstone), while to the South West of the Main drift two of the largest of the veins were followed until they ran directly into a true fissure vein and a contact vein at that, there the cross veins or feeders ended, beyond the vein and in the slate not a sign of Quartz was seen." These old workings are shown on the old plan at the mine office, and have been reproduced on the accompanying plans; this old plan shows only three drifts, two of which were to the North East and one to the South West, whereas Mr. Koch refers to four drifts. It is evident that these drifts shown on the plans, are on the cross veins mentioned in the old report.

The Koch shaft which is situated about 235 feet North West of the Main shaft, was sunk at an angle of 75 degrees towards the North East and followed the contact of the Greenstones and Schists. The shaft was sunk to a depth of 58 feet below the surface from which point a drift was run North Westerly for a distance of 180 feet, numerous small veins were intersected by this drift and on two of them a small amount of work was done. The main drift follows along or close to the contact of Schists and Greenstone and the face terminates in a black Graphitic slate, near this face a short drift to the left follows a small Quartz vein.

The old Koch tunnel, the portal of which is situated some 230 feet North West of the Main shaft, and close to the collar of the Koch shaft, is at an elevation of 2344 feet, it runs North Westerly for a distance of 145 feet and also South Easterly or practically at right angles for a distance of 155 feet. Referring to this tunnel in his 1886 report, Mr. Koch says - "The tunnel ----- has been driven into the mountain a distance of over 200 feet, that work, like the work in the two shafts, develops many veins and seams of Quartz, some of them very rich in Gold and one not less than four feet thick, but all in Vein Porphyry (Greenstone) and trending in the direction of the contact." These workings were examined by the writer and it was found that the outer or North Westerly section was timbered and could not be examined, the inner or South Westerly section showed numerous veins running from North to North Easterly, one of the veins was about four feet in width, this South Westerly working enters Black Graphitic schist at the face.

The Clarke tunnel was driven by the present company, the object being apparently to get under a reported high grade showing in what is known as the Briscoe pit, a short raise was extended from this tunnel to the position of this showing.

The main shaft, which was apparently sunk prior to Mr. Koch's time, is a vertical two compartment shaft sunk to a depth of 207.75 feet. The hoisting compartment of this shaft is 2.7' x 3.3' in the clear, and the manway is 3.6' x 3.3' in the clear, these are odd sizes and the hoisting compartment will not hold a standard size mine car. Four levels have been developed from this shaft as noted in Mr. Peterson's report, of which the 2nd and 4th are the most important. The 2nd level is at a depth of 97'7" from the collar of the Main shaft, the level being at an elevation of 2252 feet above sea level. The Westerly and South Westerly portions of this level, were run entirely in schist, while the North Easterly portion followed two cross or B veins to a point where they intersected, it then followed the stronger one for a distance of 27 feet. In all, six veins of the B type were intersected in the workings of this level and at least two of them appear to be of importance, the principal vein on this level, which has been shown on the large scale plan as being probably the upward continuation of No. 2 vein opened up on the 4th level, has been opened up for a length of 52 feet, it terminates on the South West side at the Schists, but continues North Easterly into the Greenstones, at several points it attains widths of over five feet of Quartz, while in the North East Face it has split up into several stringers.

The Fourth level has three workings on it, one long crosscut to the North West run for a distance of 145 feet and one crosscut to the North East run for a distance of 80 feet, both of these crosscuts were run by the early operators and are entirely in Greenstones, the North West crosscut intersects three small veins which are probably the North Eastern extensions of several of the veins cut by the latest work, the North Easterly crosscut was apparently run either on, or parallel to, one of the B type veins.

The present operators last year extended a crosscut almost due West from the centre of the shaft for a distance of 65 feet until the schist contact was intersected, when the drift was deflected to a North Westerly direction following the contact for a short distance on the Greenstone side, this drift has several turns, which were occasioned by the working leaving the contact on several occasions and being deflected into the Greenstones away from the schists, then returning to the latter and again being deflected away after the contact was intersected, the contact or A vein itself, follows an irregular course, but has a general strike of N45 degrees W and dips towards the North East at a steep angle. Allowing for all the different curves in the working, the total distance from the centre of the shaft to the present face (July 1st, 1935) is 450 feet. This face is almost under the downward continuation of the ore showing in the Briscoe Pit. In the course of this latter work, numerous Quartz veins were intersected, and twenty-seven of these have been deemed of sufficient importance to measure and locate on the plan. These Quartz veins are

in varying sizes from a few inches up to five feet, the direction of strike varies between North and South and East and West, but the predominant strike is probably N45 degrees East. The dip of the veins varies between 80 degrees and vertical. All of the veins are filled with Quartz and occasionally mineralized.

From the point where the workings turn from a Westerly to a North Westerly direction, the drift has been timbered, as it passed through oxidised material and wet ground for a distance of about 125 feet, the wetness and oxidation in this area has been occasioned no doubt by the fact that this portion of the level passes under Hixon Creek. Another section of the North West drift, from Vein No. 16 North Westerly for a distance of about fifty feet is also oxidised and wet and there is some possibility that this section is underneath an old channel of Hixon Creek, which Mr. Douglas Lay, Resident Mining Engineer, states might exist on the North West side of the present creek.

An old shaft was sunk on an A vein at a point down Hixon Creek about 540 feet South Westerly from the Main shaft, and 400 feet further down than this point, the Morrison tunnel was run into the hillside as a crosscut for 90 feet and then deflected North Westerly and run for a distance of fifty feet along a Quartz stringer (A vein) which follows the contact of a band of Greenstones and Schists.

A total of about 2500 feet or more of underground work, has been completed at the property, of this 2100 feet represents crosscutting, drifting, etc., on the various levels and tunnels, 310 feet represents shaft sinking and 90 feet represents raising. The present operators cleaned out all the old workings with the exception of the Mason shaft works, and performed between 700 and 800 feet of the above total of work.

SAMPLING AND ORE INDICATIONS

All of the workings, with the exception of the Mason shaft workings, which are inaccessible, have been sampled by channel samples out across five foot sections on both sides of the drifts and crosscuts. In addition special samples were taken across most of the cross veins. In addition to the above, several bulk samples taken at important vein intersections, were sent to Vancouver and assayed by the firm of G. S. Eldridge and Co. In all 894 samples have been taken, most of them under the direction of Mr. P. E. Peterson, Mining Engineer. Samples Nos. 617 to 694 inclusive, were taken under the direction of the present writer and represent the work done on the 4th level during the course of development this year (1935).

The bulk of the samples taken show negligible Gold values, which is not surprising inasmuch as they were taken in the Greenstones and Schist country rock.

Wherever the samples were taken in the neighborhood of where the B veins crossed the Greenstone, values were obtained and in two or three areas of this kind, the values were of economic grade. One such section is shown on the No.2 level between samples No. 137 and 154. Here an area of ground having a length of 25 feet and a width of 15 feet, averages 0.20 oz. Gold per ton, all of this area has been intersected by B veins. Two samples taken close to and including these veins, assayed 0.38 ozs. Gold and 0.45 ozs. Gold per ton, over five foot sections.

On the Fourth Level Vein No.3 shows 0.08 ozs. Gold across five feet, this while low grade is encouraging enough to justify work on this vein. Vein No.7 while being low grade on the drift, showed 8.10 over five feet in the crosscut behind (N.W. Crosscut), indicating that this vein is worthy of attention. Vein No.8 showed low values on channel sampling, but a 100# sample of the muck assayed 1.11 ozs. Gold and 7.3 ozs. silver per ton and in the section cut in the crosscut (N.W. Crosscut) behind this work, 65 feet North Easterly, showed 0.04 ozs. over 5 feet. Vein No.9 which is one of the smaller B veins, showed, according to Mr. Ross, a lot of free Gold in the floor of the tunnel, and a sample taken across 14" gave 4.27 ozs. Gold and 66.9 ozs. Silver per ton. While a muck sample from the same vein, including a lot of country rock, assayed 1.00 ozs. Gold per ton, and 7.9 ozs. Silver. Sample No. 681 taken in the top of the drift failed to disclose any value. Vein No.10 showed 0.17 and 0.10 ozs. Gold per ton on both sides of the drift over widths of five feet. Vein No. 12 showed some attractive values on the left hand side of the drift, ranging from 0.06 ozs. to 0.48 ozs. Gold per ton in five foot sections, five samples representing 25 feet of vein length averaged 0.20 ozs. Gold. Inasmuch as these latter samples were taken along the strike of a North-South B vein, they do not represent the true width, and three check samples were taken across the vein itself, which is quite prominently exposed, one No. 683 taken across 36" assayed 0.10 ozs. Gold, a channel sample on the North side assayed 0.08 over five feet, and a special vein sample, No. 684,

taken across 54", assayed 0.02 ozs. Gold. Inasmuch as this vein (No. 12) is quite possibly the downward continuation of the one on the South West drift of the old Mason workings, the values shown on the 4th level, while hardly of economic grade in themselves, are significant and justify some further exploration of this vein.

Vein No. 13 looks quite promising underground being fairly well mineralized in places, samples Nos. 685-6-7 did not show very encouraging results, nevertheless further exploration is justified here. Vein No. 16 did not disclose any value in the Quartz itself, but a five foot sample taken on the South side gave 0.12 ozs. Gold per ton. This sample was taken wholly in the Greenstone, but adjoining the vein. In Vein No. 16a, which is well defined and strikes N. 80 degrees East, several attractive assays were secured from the channel samples of the North side, viz. 0.10 ozs.; 0.65 ozs. and 0.23 ozs. Gold, all over five foot lengths. Samples taken across the vein itself, and including only the Quartz, viz. Nos. 691 and 692, gave only small Gold values. From this point in towards the face of the drift Gold values practically disappear, except at one point, adjacent to Vein No. 18, where an assay of 0.08 ozs. was secured over a five foot channel sample. In vein No. 22 which is one of a series of small veins and stringers crossing the formation, some wire silver was in evidence in a vug hole, also some Sphalerite, the indications looked promising enough to do some drifting on the vein, but the channel samples taken across the face, show only low gold values. The rock in which these veins occurred, from Vein No. 17, in to the face, has been tentatively called a Calcareous Greenstone, pending a more definite classification by the Department of Mines, Ottawa, to whom a sample has been sent. It is significant, as mentioned under Geology, that the Gold values became much lower as the veins passed through this particular rock.

RECOMMENDATIONS:

The foregoing discussion of the structural and economic features more or less indicates the policy to be followed in the further exploration of the mine. In the first place it must be borne in mind that the veins occur in a very old formation and that this formation has been subjected to a long period of erosion. Therefore, any section exposed under ground, providing it is below the zone of oxidation, is quite likely representative of an average condition to be expected at any particular horizon in the Mine, consequently, sinking to an additional depth, which would entail disproportionately high expenditures, would not supply information of any more positive character than can be obtained from the present deepest level.

On account of the irregular character of the B veins, diamond drilling cannot very well be used, until definite information is secured from the exploration of several of them.

A total of 27 veins have been opened up by the drifting on the 4th level, and out of this number, nine veins have shown sufficiently encouraging results after sampling to justify further exploration. It is therefore recommended that some time be spent in testing out as many of the nine veins as possible, one at a time, first to the South West till

Does not agree with return

the schist contact is cut and then towards the North East following the veins. If the results after some drifting on any one vein do not look sufficiently encouraging to justify further work, drifting should be suspended and trial made on another vein. In this way it may be found that several or possibly the whole mine of these veins are of economic value.

The North Westerly face of the No.4 level is at a distance of 450 feet from the shaft, and to prosecute further work, some means of ventilation will be necessary, however as the last 100 feet of work did not disclose anything of an encouraging nature, it is not recommended that any further expenditures be incurred in this section until more is known about the property.

The section towards the South East has never been explored, and this should be done forthwith, as there is every chance of encountering another series of B veins as good, and possibly better than those encountered in the 350 feet of ground explored to the North West from the shaft. It is therefore recommended that a drift be started towards the South East starting at a point to the left of where the crosscut from the shaft hits the contact. After the contact is encountered it should be followed providing it runs in a straight line, but if it turns, the drift should be carried as a crosscut straight ahead, along a South Easterly course, should any promising looking veins be cut in this work they should be drifted on both to the South West and the North West according to circumstances.

Providing sufficient encouragement is obtained from the work outlined on the 4th level, the 2nd level should be opened up and work of the same nature repeated there in order to correlate the several veins explored on the 4th level on another horizon and to block out a tonnage of ore. It may be advisable if it is at all possible, to clean out the old Mason shaft workings. The work outlined can be carried out by your present staff at the mine without any additional equipment, and in view of the capital expenditures already made, this work can now be carried out at a comparatively moderate expense.

I would suggest that two shifts be worked as at present, one shift working on B vein exploration, and the other extending the cross cut along the contact South Easterly. The work can be expedited later as soon as some definite results are obtained from one or more of the veins, in which case two machines working two shifts each can be used, for the present, however, I would recommend that no attempt be made to rush this work, but that a policy of feeling your way be pursued, in this way your superintendent will have ample time to watch the work properly.

Regarding the sampling, this should be carried out by side channels, along the South East drift, as has been practised heretofore, in the case of the drifts on the B veins a car sample should be taken from each round, also a face sample taken across the vein itself if it occupies the whole face of the drift, or across the vein and face if the vein is narrower than the drift.

An estimate of the cost of this work in detail is not possible for the reason that the work of drifting at any rate, is of an exploratory nature, and the crosscutting towards the South East may be interrupted from time to time if promising veins are intersected. Roughly speaking about 180 feet of drifting and crosscutting should be performed per month, so that about 1000 feet should be possible before the open season ends.

CONCLUSION

While no spectacular results have as yet been obtained in the way of ore values, the vein system appears to be comparable with that in the Barkerville district and the formation in which the veins occur is possibly a North Westerly continuation of the Barkerville system, in which latter, two producing mines have so far been developed.

On this account and also because several of the Veins cut in recent work show encouraging Gold values, over good widths, I believe the work recommended above is fully justified.

Respectfully submitted,

Signed - W. G. Norrie-Loewenthal

Mining Engineer.

W. G. Norrie Loewenthal

PROPERTY FILE 936015

936/7E

REPORT ON

THE QUESNELLE QUARTZ MINING COMPANY LTD.

Hixon Creek, B. C.

By

P. E. Peterson, M. E.

PROPERTY FILE
936015

October 7, 1936.

October 7, 1936.

Newton J. Ker, Esq.,
President,
Quesnelle Quartz Mining Co. Ltd.,
Vancouver, B.C.

Dear Sir:

In accordance with your request I have just completed an examination of your Company's mining properties situated on Hixon Creek, Cariboo District, British Columbia.

Accompanied by yourself we left Vancouver on September 28th returning to Vancouver October 3rd. The time spent at the mine was three days. This report covers the progress of mine development since my last recommendations of April 6, 1936. This is the third year that I have been associated with your Company, and I am very pleased to say the various recommendations of my former reports have all been carried out, and I am happy in knowing that the anticipated results from the development work have been realized.

In this report I am recommending the development of your ore bodies at still further depth so as to assure additional ore reserves for a mill that I anticipate will be your next major programme.

I am,

Yours very truly,

"P. E. Peterson, E.M."

P. E. Peterson, E.M.
Registered Professional Engineer

PEP:F

Progress Report

ON THE MINING PROPERTY OF THE QUESNELLE QUARTZ MINING COMPANY LTD.

- By -

P. E. Peterson, M. E.

Vancouver, B.C.
October 7, 1936.

Foreward:

Reference can also be had to my reports of October 24, 1933, June 18, 1934, December 14, 1934, January 20, 1936 and my last recommending development work of April 6, 1936 and July 7, 1936. These reports cover in detail all phases of your property, development work, equipment, geology and former recommendations, and it will be unnecessary herewith to repeat this information.

Development Work:

The development work during the past year has been confined entirely to the lowest No. 4 level of the mine. This level is approximately 200 feet below the surface, and is below the zone of oxidation. Here exploration work has been carried along in a northwest and southeast direction along the schist greenstone contact. This tunnelling along the contact has intercepted some 27 quartz veins varying in width from a few inches to 5 and 6 feet. It is gratifying that all of these veins have shown gold and silver values. Veins No. 8 and 9 which are approximately 20 feet apart showed good commercial values, so accordingly it was decided to explore No. 8 vein at depth so as to test the continuity and uniformity of values. Sinking on No. 8 vein was commenced during April of the present year; but during the previous Fall a small test hole was sunk on the winze for a depth of 30 feet all of which showed good commercial ore. The present depth of the winze below the 200 foot level is 120 feet, and at the present time a station is being cut at 105 feet below the No. 4 level. The winze followed the dip of No. 8 vein and has an inclination of 30° from the horizontal in a westerly direction. The cross section of the winze outside of the timber is approximately 7 feet x 12 feet. The underground station on the No. 4 level of the winze consists of a chamber 12 feet wide 14 feet long, 7 feet high, and the raise some 30 feet high above the station for a sheave wheel and an ore bin. The capacity of the ore bin is approximately 50 tons. The hoisting equipment consists of an Ingersoll-Rand Tugger Hoist and a $\frac{1}{2}$ inch steel cable and a steel bucket with a capacity of half a ton. The bucket is fitted with outside lugs, and is so arranged that the bucket dumps automatically into the ore bin. This underground station, the ore bin and the hoisting plant is well constructed and operates efficiently and economically. The present equipment is such that without any further additions the winze may be continued a further depth of 200 feet to the present objective which is the 500 foot level.

Attached hereto is a plan showing the workings on the 200 foot level, and also a diagram showing the sampling at the winze and on the station of the 300 foot level.

Sampling & Values of Ore Developed:

The following assays were taken from the winze on No. 8 vein. The width sampled and their location is shown on the accompanying assay plan.

A S S A Y S

<u>Width Sampled</u>	<u>Sample No.</u>	<u>Oz. Gold Per Ton</u>	<u>Oz. Silver Per Ton</u>	<u>Total Value</u>
16"	751	0.32	3.2	\$ 12.96
19"	752	0.14	2.8	6.58
28"	753	0.06	0.84	2.59
12"	754	0.04	0.66	1.79
18"	755	1.41	49.3	79.99
Sulphides	756	10.35	51.3	385.25
4'	756	0.90	3.1	32.62
Sulphides	758	1.36	2.9	48.13
43"	758	0.01	0.36	.57
42"	759	0.86	2.7	31.00
Average muck 5'x7'x12'	760	0.82	5.3	31.33
42"	761	0.08	.31	3.03
36"	762	0.01	0.32	.55
Average muck 5'x7'x12'	763	0.30	12.35	22.55
37"	764	0.005	.10	.24
48"	765	Trace	.08	.05
Average muck 5'x7'x12'	766	0.20	0.92	7.40
30"	767	0.005	0.26	.34
30"	768	0.01	0.16	.44
Average muck 5'x7'x12'	769	0.10	3.40	3.61
24"	770	0.01	0.16	.42
48"	771	0.06	0.64	2.39
Average muck 5'x7'x12'	772	0.10	0.86	3.89
48"	773	0.05	0.40	1.93
48"	774	0.55	1.40	19.88
Average muck 5'x7'x12'	775	0.10	0.62	3.78
48"	776	0.06	0.46	2.31
48"	777	0.24	1.0	8.85
Average muck 5'x7'x12'	778	0.09	1.1	3.65
66"	779	0.07	0.68	8.71
66"	780	0.02	17.8	8.71
Average muck 5'x7'x12'	781	0.18	1.1	6.80
66"	782	0.03	0.16	1.12
42"	783	1.01	0.44	35.55
Average muck 5'x7'x12'	784	0.10	0.32	3.64
66"	786	0.30	0.44	10.70
Average muck 5'x7'x12'	787	0.72	0.96	25.63
66"	788	5.69	2.4	200.23
72"	789	0.04	0.30	1.54
Average muck 5'x7'x12'	790	0.08	0.44	3.00
48"	791	0.01	0.10	.40
Average muck 5'x7'x12'	792	0.16	0.22	5.70
66"	793	0.12	1.17	4.97
Average muck 5'x7'x12'	794	0.26	0.66	9.40
60"	795	0.25	1.8	9.56
Average muck 5'x7'x12'	796	0.12	0.36	4.36
60"	798	0.02	0.14	.76
Average muck 5'x7'x12'	799	0.18	0.44	6.50
48"	800	0.41	0.48	14.87
Average muck 5'x7'x12'	801	0.08	0.18	2.88
36"	802	0.27	0.91	9.86
Average muck 5'x7'x12'	804	0.46	4.6	18.17
66"	805	0.32	0.14	11.26

<u>Width Sampled</u>	<u>Sample No.</u>	<u>Oz. Gold Per Ton</u>	<u>Oz. Silver Per Ton</u>	<u>Total Value</u>
Average muck 5'x7'x12'	806	0.17	0.10	6.00
" " 5'x7'x12'	807	0.05	0.40	1.93
" " 5'x7'x12'	808	0.27	0.24	9.56
" " 5'x7'x12'	809	0.10	0.40	3.68
" " 5'x7'x12'	810	0.04	0.10	1.45
" " 5'x7'x12'	811	0.13	0.36	4.72
48"	812	0.24	0.36	8.56
42"	813	0.05	0.04	1.07
72" P.E.P.	20	0.57	0.73	20.28

The foregoing sampling from the winze sunk on No. 8 vein from the 200 to the 320 foot levels shows an average width of all the channel samples as being 45 inches. The Average gold content is .48 ounces per ton; the average silver content is 2.08 ounces per ton. At the present prices of gold and silver the total value is \$17.74. In arriving at this average 2 high grade samples of sulphides Nos. 756 and 758, one totaling \$385.25 and the other \$48.13 were not considered and not taken into the average. As a check on channel sampling average muck samples had been taken. These muck samples represent a width of 7 feet and a length of 12 feet and a depth of 5 feet; thus the width sampled in the muck samples was almost twice the width of the vein. In other words the average muck samples were approximately half waste rock. The average value of all the muck samples from the 200 to the 320 foot level in gold and silver is \$8.25. This is a reasonably close check on the channel sampling.

Geology:

Number 8 vein on the 200 to the present depth of the winze, 320 feet is in the unoxidized primary mineral zone. The country rock is greenstones, a similar type of host rock to that of many of our successful Canadian gold producers. The ore minerals associated with the vein quartz are a pyrite and arsenopyrite and occasional small amounts of galena. These are all primary minerals of the type usually associated with gold mineralization, and I believe that the ore will continue to appreciable depth.

Other Veins:

The development work on the greenstone schist contact on the 200 foot level has disclosed approximately 27 veins and stringers. All of these veins were found to be gold bearing; several of them showed good commercial ore. No. 9 vein is particularly attractive; it parallels No. 8 vein to the northwest at a distance of approximately 20 feet. Two other veins to the southeast approximately 60 feet are also attractive in as much as in the upper levels in the oxide zone it was from these veins that the first gold production in the early 80's was obtained. It is not unreasonable to expect good results from the development of the other veins, results that should be comparable to those obtained from the development of No. 8 vein.

Ore Tonnage:

At this stage of the development work I do not think it wise to discuss tonnage figures other than to say that the present indications are (taking into consideration the many veins) that this mine may develop into a large producer.

Recommendations:

Continue the sinking of the winze on No. 8 vein another 200 feet, cutting stations at the 300 foot level, 400 foot level and 500 foot level. Crosscut along the

contact at each of the new levels to intercept veins to the north, west and southeast, and drift on these veins to prove up values and ore tonnage.

The working crew at the mine should be increased by another shift of 4 miners. This should result in approximately a 40% decrease in the footage costs. The same overhead and surface crew will handle 2 shifts of miners as are now being used for one shift.

It is proposed that the new main 3 compartment shaft will be excavated by raising instead of sinking from the surface. By this method a shaft can be put in at about one third of the cost of sinking. The location of the new shaft will be in the non-ore bearing schist rocks and thus be out of the zone of ore stoping. A tunnel from the 500 foot level of the winze on No. 8 vein would be driven under the location of the proposed main shaft.

Milling Plant:

While the present development work has indicated ore continuity that would justify a small Pilot Mill, however I would rather wait the continued satisfactory development of the mine on the 300 foot and 400 foot levels; then the Pilot Mill can be built which later can be increased in size as development work warrants.

Conclusions:

The mine is equipped with a good plant and living accommodations for the development programme now under way. The plant is economically and efficiently operated and managed.

The results from the development work to date have been very good, and I see no reason why this mine will not develop into a successful gold producer.

Respectfully submitted,

P. E. Peterson E.M.

P. E. Peterson, E.M.
Member of Professional Engineers of B. C.,
Member of the Canadian Institute of
Mining & Metallurgy.

P. E. PETERSON, E. M.

MINING ENGINEER

955 THURLOW STREET OR 1008 Stock Exchange Bldg.
VANCOUVER, B. C.

June 18, 1934

936/4E

Newton J. Ker Esq.,
President,
Quesnelle Quartz Mining Co. Ltd.,
Vancouver, B. C.

Dear Sir:

As per your request I have made an examination of your Company's mining properties situated on Hixon Creek, Cariboo District, British Columbia.

This report is the result of examination, sampling and mapping of all the mine workings which have now been re-opened, and is intended as a preliminary only to my final report to be completed as the recommendations as to development work have been carried out. Herewith is enclosed the report with my recommendations.

Very truly yours,

P. E. Peterson E.M.
P. E. Peterson, E.M.

PEP:F
Enc.

Report on the Mining Property of the
QUESNELLE QUARTZ MINING CO. LTD.

- by -

P. E. Peterson, E.M.

Vancouver, B.C.
June 18, 1934

INTRODUCTION:

My first report on this property of October 24th, 1933 gives in detail the extent of the property, location, history, topography, climate, water supply and timber. The general geology is completely covered, and plans of mine workings that have been unwatered were submitted. Since this first report there has been no addition to the buildings and machinery and mine equipment.

RE-OPENING OLD MINE WORKINGS:

In accordance with the recommendations in my earlier report all of the mine workings have now been re-opened, and in addition to this a new tunnel was driven and has been called the Clarke tunnel, for the purpose of confirming a previous discovery of spectacular high grade free gold quartz ore. A general map has been prepared showing the relations of all the mine workings to each other. This map shows the location of quartz veins and geological features such as the contacts between the schists and the ore bearing greenstones.

GEOLOGY:

The mapping and sampling of these old mine workings has proven conclusively that the principal zones of ore enrichment lie in the greenstones in close proximity to their contact with the schists. The greenstone as a whole is practically all gold bearing carrying low values. The schists have been found to be barren of gold values. Numerous quartz veins and silicified zones are in the greenstone rocks bordering this contact, and in fact spectacular ores that first attracted the pioneer miners to this location were found in the main shaft in the greenstone rocks near a schist contact. The latest discovery of spectacular gold quartz ore was found in a raise from the Clarke tunnel in the greenstones also very close to the contact.

The greatest enrichment of gold values are in the quartz veins near the contact. It was from these quartz veins in the main shaft that the Bonanza ore in the early days was mined and milled, and the latest discovery made in the raise in the Clarke tunnel above the workings of the old Koch shaft some 360 feet easterly from the main shaft are also in the greenstones bordering the contact.

ORE ZONE:

Work to date has disclosed a definite ore zone in the greenstones in close proximity to the schist contact. The principal values are concentrated in silicified shear zones and veins in this zones. There is now every reason to believe that mining development along this zone on the lower level of the main shaft should result in the development of commercially valuable ore shoots. The sampling has disclosed that the lower workings from the main shaft were driven some distance away from this favorable contact zone.

ORE VALUES:

In the old workings of the main shaft beginning at a depth of 97 feet 7 inches at the No.2 level there is a silicified zone in the greenstone from which assays as follows have been obtained:

Sample #157	across	5 feet	Gold	.45 ounces	Value	\$15.30
Sample #156	"	5 "	"	.26 "	"	8.84
Sample #138	"	5 "	"	.18 "	"	6.12
Sample #137	"	5 "	"	.26 "	"	8.84

On the next lower level, the 3rd level at a depth of 145 feet 6 inches

Sample #96	across	5 feet	Gold	.12 ounces	Value	\$4.08
Sample #97	"	5 "	"	.19 "	"	6.46

On the lowest level No.4 at a depth of 195 feet 9 inches

Sample #36	across	5 feet	Gold	.26 ounces	Value	\$8.84
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All of the above samples were taken out of quartz veins in silicified zones in the greenstone near the schist contact.

In the vicinity of the Koch shaft and workings where the Clarke tunnel has been driven quartz veins and silicified zones have yielded average samples ranging from \$1 to \$3 in gold and some spectacular specimen ore in small quantities assays of

which ranged from 3 to over 200 ounces of gold to the ton, actual value ranging as high as over \$7000.00.

Study of this sampling indicates and shows the possibilities of ore development along this greenstone contact zone.

RECOMMENDATIONS:

Considering the geological information and results of mapping and sampling obtained from the cleaning out of the old workings it is now evident that the lowest level from the main shaft has been driven some distance away from the favorable ore zone. I therefore recommend that the course of this lower level tunnel be changed so as to traverse the greenstones in close proximity to the contact. This main tunnel should be continued under the workings of the lower Koch shaft and tunnels, and under the high grade ores as disclosed in the Clarke tunnel.

1. The cross cut is to be driven from the end of the west drift in a southerly direction till the schist contact is encountered.
2. After the contact has been established then drifting is to be continued in a northwesterly direction along this contact for the purpose of developing ore shoots .
3. As a preliminary to this work it will be necessary to re timber small portions of the main shaft.
4. In order to economically handle the pumping of water in the main shaft you should purchase a 7 or 8 H.P. Diesel engine and an electric dynamo for the purpose of operating a 5 H. P. electric station pump from the lowest level. This equipment will satisfactorily take care of your water and allow all of your present air supply from compressors to be used for rock drilling.
5. The shaft should be equipped with a mine cage suitable for hoisting rock cars from the workings.

GENERAL:

Since my last visit in October of last year I have found that all of the work has been carried out satisfactorily and in an efficient and economical manner. At the present time I found the mine operating efficiently and very satisfactorily under the foremanship of Mr. Russel Ross. I feel that your money is being economically expended.

CONCLUSION:

X
The geology of this property has been rather complex and baffling, but now that all of the old workings have been re-opened and sampled it has been proven that the gold ores are located in enrichments in the greenstone zone traversing close proximity to the schist contact, and I feel confident that mining development carried out in this zone should prove up tonnages of commercially valuable gold ores.

Respectfully submitted,

P. E. Peterson E.M.

P. E. Peterson, E.M.
Member of the Professional Engineers of B.C.
Member of the Canadian Institute of
Mining & Metallurgy.

936/4E

at Quesnel.
c/o Cariboo Hotel,
May 31st, 1938.

Dr. John F. Walker,
Deputy Minister of Mines,
VICTORIA, B.C.

Sir,

re Quesnelle Quartz Mining Co., Ltd.

I beg to advise that just as I was about to start off for Horsefly to commence the planned field-work in that area, I heard that a limestone replacement deposit had been discovered at the property of Quesnelle Quartz Mining Co., and I therefore decided to visit that property first before proceeding with the planned field-work, as this type of deposit was not known to me at this property.

The position is that a detailed examination of this property was recently made by Mr. W.F. Patmore, and he classifies the massive-appearing rock adjoining the schists on the north-west as "limestone", which we have ab initio classified as "greenstone" of igneous origin, and the mineralization therein as a "replacement in limestone". While what may be described as the "commercial picture" of the property remains unaltered by this new classification of Mr. Patmore's (it is still obvious in Mr. Patmore's opinion that the zone of mineralization and its promise is that adjacent to the contact of the schists with the "greenstone" or "limestone") the original identity of the rock in question whether igneous or sedimentary is a matter of some importance.

I would especially call to your attention the fact that in I think the year 1933(I have not my files for reference) when unwatering of the old shaft sunk many years ago rendered ~~inspection~~ examination of the underground workings possible, I forwarded specimens of this "greenstone" to the Department, and they were forwarded by the Department to the Geological Survey, Vancouver, for examination and thin-sectioning, with a view to determine if the rock was a volcanic or intrusive. The report of the Geological Survey thereon, or the gist of the same, was forwarded to me at that time, and my recollection is that while there was not the slightest doubt as to the igneous origin of this rock, the report was to the effect that it could not be determined by thin-sectioning whether the rock was intrusive or volcanic. You will readily of course be

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PROPERTY FILE

able to refer to the Departmental files , and obtain the original report of the Geological Survey.

At the time of my examination of this property in 1925 when a detailed report appeared in our Annual Report for that year, the exposure of this rock given by running the level at a depth of 200 feet approximately (now known as No.4 level) with very liberal displays of chlorite, and its essential feature that of a massive rock in contradistinction to the thinly bedded bordering schists entirely confirmed the view , that this rock, although obviously highly metamorphosed was of igneous origin. Although I have not made a detailed examination of the level recently driven at a depth of approximately 400 feet (now known as No.6 level), (an examination which would obviously occupy some days), I cannot see any obvious reason for departing from the conclusions originally formed.

I do not question for a moment that a chemical analysis of the rock in question would disclose large amounts of calcium and magnesium carbonates, indeed I have pointed out this fact in reports, but I am a loss to understand how it is possible to reconcile the structural and other features with its classification as "limestone". One has I think to run across many altered igneous rocks to appreciate the high degree of alteration to which they have been subjected. For example the host-rock of the Topley Richfield mineralization carried quite a high percentage of calcium and magnesium carbonates. In the Manson Section there are also igneous rocks which have been very highly metamorphosed.

The manager of Guesnelle Quartz Mining Co. informed me that Dr. Cockfield had made a detailed examination of this property last year, and if so, I presume that you could readily obtain a copy of his report, which will disclose his opinion of this rock.

In case you should yourself wish to see additional specimens of this rock over and above those that I have in the past forwarded, I send you by this mail under separate cover specimens 2921B from the various levels. You may of course have some thin-sectioned.

Specimen 2921B is a schistose "greenstone" bordering the more massive greenstone at the northern edge of the latter on No.6 level, and might possibly be a sedimentary rock. Specimen 2922B is a specimen of the more massive "greenstone" from No.6 level. Specimen 2923B is of the "greenstone" from No.2 level. Specimen 2924B is "greenstone" from No.4 level, and specimen 2925B is of hydrothermally altered "greenstone" with development of chlorite, from No.4 level.

I was at this property on Sunday last and yesterday and in the time available, it was not of course possible to undertake any detailed sampling. I occupied my time in channel-sampling exposures of mineral on No.6 level, at points where

the manager indicated the best values had been obtained. The host rock is very hard, and sampling cannot be quickly carried out, and climbing up and down the 400 ft. ladderway consumes a good deal of time.

Quartz veins are not as numerous, I think, on the No.6 level as on the No.4 level, but mineralization in the rock generally is more prevalent adjacent to the quartz veins.

I am very decidedly of the opinion that bulk-sampling is of especial importance at this property. It is also evident that a very large amount of sampling will have to be carried out, and mining controlled thereby.

Under separate cover I forward to our Assay Department Samples 2917B to 2920B (both numbers inclusive). Sample 2917B is taken across 8.25 feet between points 30 to 38.25 feet north-west of bottom of winze, No.6 level. Sample 2918B is taken across 11 feet between points 50 to 61 feet north-west of bottom of winze, No.6 level. Sample 2919B is taken across 13 feet between points 89 feet and 93 feet north-west of bottom of winze No.6 level. Sample 2920B is taken across 11 feet between points 66 feet and 77 feet south-east of bottom of winze No.6 level. The first three-mentioned samples were taken on the north wall of the drive, and the last-mentioned on the south wall of the drive.

As to the character of the mineralization on No.6 level:-

I examined all the channel samples after they were taken, at the surface, and while no doubt a more detailed examination of this level might disclose the presence of other minerals, the samples showed essentially and almost entirely iron pyrite, some of which appears as quite coarse cubes. This mineralization occurs in the quartz veins, and also quite liberally in the host rock adjacent to the veins, and at other points. While I am of course well aware of the fact that "replacement action" figures largely in almost all types of mineral deposits of magmatic origin, I hardly think that the term "replacement deposit in limestone" or "replacement deposit in greenstone" conveys quite the correct impression, without a considerable amount of additional explanation. For example the former description in the absence of further explanation conveys I think to the mind that the occurrence is more or less that so frequently described in technical literature, and is more or less in conformity with the text-book type.

I should add that the winze sunk from No.4 level to No.6 level followed "No.8" vein downward, until this vein split and passed out of the working. The manager stated that for the first 100 feet, samples taken across an average width of 45 inches yielded an average of 0.48 oz. gold per ton; and 2.08 oz. silver per ton.

(4)

At this property at the present time, about 10 men are employed, no mining is being carried on, as energies are being concentrated on construction of a pilot mill of 25-ton daily capacity to be operated by a 120 h.p. Diesel engine driving an electric generator. All machinery in the mill will be motorized. The manager further stated that the Mines Branch Ottawa had made a careful test of the ore, had recommended a flow-sheet involving straight cyanidation, which would be carried out. It was hoped that the pilot mill would be ready by the end of July. Mining operations were however to be resumed before this date. The mill building is about completed, but the machinery is yet to be installed.

I enclose tracing of map of recent transit survey of mine by H.H. Roberts B.C.L.S. Will you kindly have one ozalid print made of this, and forwarded to me?

I shall await your comments on this letter with much interest when you find it convenient to let me have them. I feel sure you will agree that ab initio we took every care by submitting specimens to the Geological Survey ~~in~~ supplemented by examination on the ~~firm~~ ground to endeavour to ascertain the actual identity of the "greenstone".

I am, Sir,

Yours faithfully,

Mining Engineer.