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PROPERTY FILE

REPORT ON

THE RICHFIELD MINE

TOPLEY, B.C.

BY J.M.TURNBULL, R.P.E.

MINING ENGINEER,

VANCOUVER, B.C. DECEMBER 26.1927.

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December 26th, 1927.

The Topley-Richfield Mining Co.Ltd.
P.O.Box 134,
Smithers, B.C.

Gentlemen,

I spent four full days examining the Richfield Mine, from Dec.15 to Dec.19, 1927. I took sixty samples from the underground workings. The positions and assays of these samples are shown on the attached plan, which forms an essential part of the attached report. Certain Geological features are also noted on the plan.

Owing to snow I was unable to see anything on the surface, except the plant, but, as information was available from reports or letters of a number of reliable engineers in regard to surface workings and assays, this drawback was not very serious.


I did not investigate your titles nor your claim areas, but satisfied myself from an inspection of your claim plans, that the showings are amply protected in regard to extensions for a long time to come.

The following points are covered in the report:-

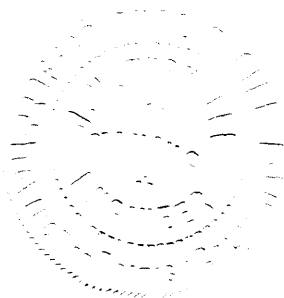
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Trusting that these points will cover what you require, the whole is respectfully submitted,

Yours faithfully,



Mining Engineer,



CONCLUSIONS.

Assuming a satisfactory treatment method, your chief problem becomes that of development of adequate ore reserves. Summarizing briefly, I believe that the possibilities are favourable enough, in regard to treatment and development to warrant the expenditure of enough money to carry out the necessary treatment tests and to develop the ground enough to prove its possibilities. That is to say the possibilities at present warrant the risking of a further preliminary expenditure of say \$25,000 to \$50,000 in development. My chief reasons are as follows:-

1. General magnitude of shearing and intensity of alteration indicate mineralization on a large scale. Geological conditions are favourable. Large ore bodies are therefore possible.
2. Development has not progressed far, but already indicates a wide mineral zone. 250 ft. along the ore zone, by 100 ft. in width, on the 100 ft. level, partially developed only, constitutes the main development at present. The possibilities are therefore largely untouched yet, and offer a chance of large size.
3. The ground now developed happens to be in a section badly broken by faults, and is therefore unfavourable for continuous orebodies. There is an excellent chance of great improvement in this regard, and of better definition, as development proceeds.
4. Although even the known orebodies have not yet been fully followed out, the three best showings alone, in this broken ground, and only as far as followed, show up a tonnage of approximately 30 tons of \$13.00 ore per foot of depth.
5. In the bottom of the shaft the ore appears to be entering the footwall Andesite formation. While low grade, this opens up an unknown possibility in a different formation. In fact no definite limits have yet been found to ore deposition on surface or underground. A small well defined vein occurs in the Andesite, in No. 2. E X cut, showing that this formation may have interesting possibilities. The vein has good values.
6. While the showings are somewhat confusing to develop at present, a rapid increase in efficiency of development will take place as the structure becomes better defined, so that cost of development is not likely to prove excessive.

VALUES.

The chief element of doubt appears to lie in Values rather than in tonnage. It is impossible to predict mining, milling and development costs at present with any accuracy. The lower the workable value the greater the available tonnage and vice versa. Extremely low costs are not indicated, but there is a fair supposition that a balance may be found at

not over \$7.00 per ton, based on 200 to 300 tons per day of production. Subject to correction, particularly from the results of treatment tests, this may be taken as a tentative line between ore and waste in figuring development results.

There is no strong evidence of appreciable decrease in values due to depth. Secondary enrichment seems to be largely confined to a shallow surface zone. I think the chance of continuity of values is worth the risk, though the average grade may eventually prove too low, over a reasonably large tonnage, to make a large mine. In this case there will remain the possibility of smaller profits, working the better sections on a smaller scale, so that in any event there should be a considerable return on the investment ultimately.

The margin is however not large enough to cover inefficiency or extravagance and good management will be a very essential factor in success.

In addition to Gold and Silver, there will be a small amount of Lead and Zinc to recover. The Gold and Silver are the essential values, and, not being in constant proportion, may be associated with different minerals, which may give rise to treatment difficulties and complexities. It is therefore essential that treatment tests should progress far enough to indicate satisfactory recovery of both metals, before large expenditures on development are undertaken.

TREATMENT AND TRANSPORTATION.

No treatment tests have been made. The ore is essentially a milling proposition. As the future of the mine depends on treatment, as well as on tonnage, early tests are indicated. By appearance, it seems likely that flotation should give reasonably high recoveries, with a relatively high ratio of concentration. If so, your shipping product would be relatively small in bulk and make your transportation problems easy, and cheap per ton of ore, as an easy wagon road grade to the railway can be obtained with a drop of about 1,500 feet in a distance of less than seven miles. The present road to Topley is about 8 miles, but can readily be shortened and improved. Easy construction is indicated with no adverse grade.

ORE BODIES.

Certain Orebodies are partly developed and may be discussed to give some idea of what development has so far disclosed. See attached plan.

1. 100 ft. level. No. 2 W. Xcut. Samples 45 to 50 indicate an orebody extending to the N.W. not yet drifted on, which would probably show up some good ore.

2. 100 ft.level, main drift N.of No.2 E Xcut. Samples 37 to 40 show up ore as follows: Length 20 ft.,Average width 3.2 ft. Av.value \$20.47. Not fully developed. (Silver at 57¢ per oz.)

3. 100 ft.level, No.3 Xcut W. Samples 15 to 24 and 54 to 60 This orebody is only half developed,good ore continuing to the N.W. Developed length 60 ft. Av.width 2.9 ft. Average value \$12.38.

4. 100 ft.level, No.4 Xcut W. Samples 32 to 36. Partly developed as Xcut is probably off the main ore inside of sample 32 as exposed by a recent blast. Developed length 40 ft. Av width 2.3 ft. Av.value \$10.12.

5. 100 ft.level, No.5 Xcut W. Samples 7 to 14, while low grade, are from relatively large and strong showings and indicate a possible good orebody, if drifted on to the N.W.

Combining 2,3, and 4, we have approximately 30 tons per foot of depth averaging \$13.21 per ton. A comparatively small amount of further development on these might easily double this tonnage. The above five showings are included in a length of about 200 feet along the general zone.

6. Taylor crosscut, 50 ft.level. Samples 25 and 26 represent the low grade side of the crosscut. Judging from numerous engineers samples that I have seen, the values here would probably average much like those on the 100 ft.level, that is from \$10 to \$15 per ton. Owing to its width of over 15 ft. the developed length of 20 feet alone represents nearly 30 tons per foot depth and tends to confirm the vertical continuity of the ore bodies, especially in conjunction with the good oxidized ore also exposed and represented by sample 27.

7. Surface oxidized ores of the type of sample 27, and of good grade appear to occur in the outcrop. These may possibly prove to be an asset of considerable value.

GEOLOGY.

The ore occurs in a formation locally known as Topleyite, which is a highly altered rock containing roughly 50% silica and up to 40% of lime and magnesia carbonates. In this formation are a number of dark irregular bands. The appearance suggests a highly contorted and faulted limestone-slate formation, chemically altered, but more likely perhaps is a tuff or much altered variation of the Andesite which adjoins it. The Andesite is a very dark blocky basic volcanic rock which looks like a basic dyke, but is reported to form the mass of the mountain which lies to the N.E.

The fault contact between the Andesite and the Topleyite strikes about N.30° W. and dips 55° Westerly, the Andesite being on the Easterly side. The line of contact is nearly straight as far as exposed. The surface is practically all covered with

glacial drift, so that the extent of the occurrence cannot be traced by outcrops. One oxidized outcrop is reported, carrying fair values, some 300 feet N.E. from the shaft.

Ore occurs in the Topleyite in a series of irregular bands, corresponding chiefly with the darker bands of rock, which appear to angle away from the contact, and plunge downwards, towards the N.W. There is much faulting and folding and the true structure is not yet certain. The contact may be taken provisionally as the footwall of a zone of unknown width, in which ore has been found so far for a distance of about 100 ft from the contact. The surface is reported to show ore for a width of 300 ft. and for about the same length, any extensions being covered with glacial drift.

Mineralization consists of Pyrite, Arsenical Iron, and slight Galena and Zinc Blende, with considerable quartz in places, some of the latter showing banded vein structure. High temperature minerals are not noticeable in general. The metallic minerals are small in quantity, say under 5%, and are generally disseminated in moderately fine sized crystals. The gangue is mostly the darker Topleyite, sometimes hardened by silicification, but generally fairly soft. In the sump of the shaft mineralization occurs apparently in the Andesite just under the contact and ~~xxx~~ looks much like the darker ore bands in the Topleyite. In No. 2 E Xcut a small vertical well defined vein, with frozen walls, occurs in the Andesite, with good values. It is the best defined showing in the mine. Evidently the Andesite is not necessarily a barren formation.

The essential values are Gold and Silver, the best grades being usually associated with perceptible amounts of Galena and Blende. Their exact mineral association is not yet known.

DEVELOPMENT.

There is at present nearly 800 ft. of underground development work, partially developing to a depth of about 100 ft., a length of about 250 ft. and a width of about 100 ft. Further preliminary development is required to define the nature and extent of the orebodies. Driving N.W. from Sample 60, with possibly a little raising and sinking here, would help to define the best present exposure and prove whether or not the ore has a N.W. running tendency. General extensions of drifting along or parallel to the contact, Northerly and Southerly are also indicated, in the latter case following the ore at the contact shown by sample 53. It is a little early yet to decide on a permanent shaft location, the present shaft not being very well situated, or on any particular system. The slope of the ground is too flat for development by tunnel and shaft sinking will be required.

DIAMOND DRILLING.

The formations being soft could be drilled very rapidly. The chief difficulties would arise from the soft faults which would cause loss of core and perhaps caving of holes in places. Diamond drilling would give much valuable information in regard to extent and direction of the ore zone and occurrence of ore, but core assays would be uncertain in regard to average values as the ore is somewhat spotty. A little more underground drifting would probably enable drilling to be planned more intelligently, and should be done first.

Surface conditions would be apparently fairly good for Electrical prospecting, but the nature of the ore, low in metallic content, suggests that the results might be rather indefinite. It does not appear advisable at present.

PLANT AND EQUIPMENT.

The present equipment, including a 50 H.P. Vickers-Petter oil engine and 240 cu.ft. belt driven compressor, is neatly installed and capable of carrying out the preliminary development required for some time to come, without any further major expenditure, though a larger hoist might soon be found advisable. There is no evidence of extravagance at the mine, the whole layout has a business like appearance, and the management appears to be efficient and economical.

POWER.

A good water power is reported to exist some 20 miles to the North, which may be useful in the future. For the present oil fuel appears to be the most convenient and cheapest source of power. There is no water power in the vicinity.

GENERAL CONDITIONS.

These may be considered quite favourable. The ground is easily mined and stands fairly well, not requiring much timber. There is ample fair timber on the ground for mine and firewood, and probably sufficient water for domestic and milling purposes, though the supply is rather limited. Pumping is required, the mine at present making under 10 gallons per minute. The water is hard and should be tested for use in milling when flotation tests are made. It is impossible to predict the best mining method yet, until the ore zones are better defined, but as the ore seems to have a rather flat-lying tendency, ease in breaking may be offset by some difficulty in handling, so that, in the meantime very cheap mining costs should not be anticipated, though, on the other hand, there are no special difficulties which would give rise to high costs.

The mine is located about 7 miles North of Topley, B.C., which is 285 miles, by rail, East of Prince Rupert. Topley is about 2,000 ft. above sea level, and the mine about 3,500 ft. above sea level. The deposit is more or less unique, there being no other mines nearby to which it can be compared. There is good sleighing for several months in the winter.

H.L. BATTEN
Mining Engineer
Vancouver Block
VANCOUVER, B.C.

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November 24, 1928.

Messrs. Miller, Court and Co., Ltd.,
Vancouver, B.C.

Dear Sirs:

Following is our progress report on the Topley Richfield operation to date:

UNDERGROUND WORK

East Vein
No. 3 Drift N. has been advanced about 160' since our last report, to 210' from the X-Cut. From near the north end of this drift a crosscut has been driven 20 feet to the west.

From the face, to about 80 feet from the face, the drift follows a quartz vein about 15" in width, with negligible values. In the face this vein is very narrow and dips flatly to the east.

It has been considered that this vein is the downward continuation of the East Vein, exposed on the surface, but its present appearance in the drift causes the writer to doubt if this is the East Vein.

The face of the drift is vertically under the East Vein where exposed on the surface and it appears likely that the East Vein is faulted off somewhere between the surface exposure and this drift.

For 80 feet in No. 3 Drift N. the vein is 15" to 20" in width and the average value is about 6 ozs. silver and about 5% zinc. The best assays obtained are as follows:

| | | | | |
|-------------|----------------|------------------|-------------|------------|
| Across 4" - | gold 0.05 ozs. | silver 34.4 ozs. | copper 2.7% | zinc 18.5% |
| " 18" - | gold 0.08 ozs. | silver 12.3 ozs. | copper 0.9% | zinc 8.4% |
| " 15" - | gold 0.10 ozs. | silver 11.1 ozs. | copper 0.6% | zinc 6.6% |

This vein has some commercial possibility and further work should be done on this and the other quartz veins. Also further work should be done to determine what happens to the East Vein going down, as the East Vein, judging from its surface exposure, certainly has commercial possibilities.

Work done to date on the quartz veins has been disappointing and has not shown any commercial ore. At the same time we consider that some production may be expected from these veins. They do not offer, however, as interesting prospects as the replacement zone in the Topleyite which is described later, and as the mine has only a small plant, all equipment, for the present, should be kept working on that zone.

No. 1 Drift S
Main Drift S has been advanced about 90' since our last report, and about 50 feet of crosscutting, east and west, has been done off this drift.

This drift follows the Topleyite-Andesite contact. At and near the contact the Topleyite is mineralized with pyrite and a little sphalerite, but values are very low.

In a crosscut west, off the drift, the Topleyite is shown to be only about 12 feet in width, when andesite comes in again. This crosscut should, later on, be pushed further ahead or a drill hole put in west from the face of this crosscut, as it appears most likely that more Topleyite will be found west of a narrow band of andesite, and that the andesite showing in the face of the crosscut is not the main body of andesite.

No commercial material was shown in this drift and the following are the best assays obtained:

| | | | |
|-----------|-------------------|------------------|---------------|
| Across 3' | - gold nil, | silver 5.4 ozs., | copper 0.05%, |
| | | | zinc 0.8% |
| " 3' | - gold nil, | silver 5.0 ozs., | copper 0.05% |
| | | | zinc 0.8% |
| " 2.5' | - gold 0.02 ozs., | silver 2.0 ozs., | copper 0.05% |
| | | | zinc 0.8% |
| " 2.5' | - gold 0.02 ozs., | silver 2.9 ozs., | copper 0.10% |
| | | | zinc 0.5% |

So far, no commercial material has been exposed in the section of the workings south of the shaft. It is necessary to stop work in this section for the present in order that equipment may be concentrated on sinking and drilling but further work will be done in this section when equipment is available.

No. 4 X-Cut W. one of the workings done by the Standard, has been advanced about 50 feet. This crosscut is in mineralized Topleyite, carrying fair values, and shows extension in width of the main mineralized Topleyite zone. The country exposed in this crosscut is mineralized Topleyite with dark quartz, and carries values of commercial grade. The following assays were obtained from this X-Cut.

| | | |
|------------|-------------------|------------------|
| Across 15" | - gold 0.11 ozs., | silver 1.10 ozs. |
| " 15" | gold tr " | silver 1.80 " |
| " 12" | gold 0.01 " | silver 3.4 " |
| " 15" | gold 0.01 " | silver 0.3 " |
| " 15" | gold 0.02 " | silver 0.4 " |
| " 4" | gold 0.40 " | Silver 114.7 " |
| " 6" | gold 0.22 " | silver 26.0 " |
| " 12" | gold 0.20 " | silver 12.8 " |
| " 24" | gold 0.18 " | silver 12.9 " |
| " 12" | gold 0.27 " | silver 22.0 " |
| " 30" | gold 0.01 " | silver 1.0 " |
| " 18" | gold 0.02 " | silver 2.0 " |

This crosscut passes through the hanging wall bank of mineralized Topleyite and is development work in a block of ground carrying good values that has very interesting possibilities. Work is now being concentrated on this block which consists of mineralized Topleyite with values in bands. It is probably the downward continuation of the zone exposed in the Taylor tunnel.

This block of ground has been resampled and shows a probable average value of about \$12.00 per ton, in gold and silver for a length of about 130 feet. The width, on the level, is probably over 50 feet but the true thickness of ore is expected to be very much less. The large horizontal section, at the level, is due to the very flat dip at this horizontal section. The dip of the mineralized bands as a whole is probably about 60 degrees.

Downward continuation of this block is very strongly indicated by results of drilling. The shaft is now being sunk to prove up the results of drilling and work on the lower level, if successful, will block out a tonnage of ore.

The commercial possibilities of this block of ground are excellent and definite information on tonnage should be obtained during the next four months.

DIAMOND DRILLING UNDERGROUND

Accompanying this report is a sketch showing the positions of diamond drill holes put down to date. Surface drilling was suspended about the time of our last progress report.

D.D. Hole No. 1U strikes due East, is flat and has been drilled to a depth of 683 feet. This hole was collared in the face of No. 2 X-Cut E. This hole was drilled to prospect the andesite country east of the mine workings. The hole cut no commercial ore but passed through several quartz stringers and through a silicified pyritized zone at 22 to 26 feet. The best assays obtained from this hole are as follows:

At 22 to 26 feet - gold 0.12 ozs., silver 4.6 ozs., copper Tr.,
zinc 0.5%

At 58 feet, across 6" - gold 0.02 ozs., silver 2.8 ozs., copper Tr
zinc 0.3%

D.D. Hole No. 2U strikes N 63 degrees W, dips at minus 45 degrees and has been drilled to a depth of 233 feet. This hole collars 30 feet west of the face of No. 2 X-Cut E. The hole passes under the Topleyite-Andesite contact and reaches the Topleyite at a depth of 125 feet. From 125 feet to bottom the hole is in low grade mineralized Topleyite and contact quartz vein. As the contact is dipping in the same direction as the hole, but little more steeply, the hole does not reach the zone in which values occur on the level above. The quartz vein on the contact is similar to where it is exposed in the main drift on the level and carries similar non-commercial values.

The only assays of interest obtained from this hole were as follows:

At 161 to 194 feet, average across 33 feet -
gold 0.03 ozs., silver 1.5 ozs., copper 0.1%, zinc 0.8%

At 30 feet, across 2' -
gold Tr., silver 0.14 ozs., copper 0.3%, zinc 0.5%.

D.D.Hole No. 3U strikes S 80 degrees W, dips at minus 40 degrees and has been drilled to a depth of 168 feet. The collar is located 15 feet from the face of No. 1 X-Cut E., just north of the shaft. This hole passes through the mineralized Topleyite zone. The hole starts in the Topleyite. At a depth of 40 feet below the level (vertically) the following assays were obtained:

| | | | | |
|-----------|---|-----------------|-------------------|-------------|
| Across 6" | - | gold 0.20 ozs., | silver 10.2 ozs., | copper 0.1% |
| | | | | zinc 1.0% |
| " 3.5' | - | gold 0.46 ozs., | silver 52.2 ozs., | copper 0.3% |
| | | | | zinc 3.0% |
| " 3.0' | - | gold 0.50 ozs., | silver 93.5 ozs., | copper 0.3% |
| | | | | zinc 5.4% |

Another mineralized zone was encountered about 100 feet vertically below the level and the following assays were obtained:

| | | | | |
|-------------|---|-----------------|--------------------|-------------|
| Across 4.5' | - | gold 0.08 ozs., | silver 3.0 ozs., | copper 0.1% |
| | | | | zinc 1.1% |
| " 2.0' | - | gold 0.90 ozs., | silver 114.0 ozs., | copper 0.2% |
| | | | | zinc 6.7% |
| " 12" | - | gold 0.46 ozs., | silver 9.9 ozs., | copper 0.1% |
| | | | | zinc 0.8% |
| " 3.0' | - | gold 0.15 ozs., | silver 6.2 ozs., | copper 0.1% |
| | | | | zinc 1.0% |

A composite assay of this material was gold 0.45 ozs., silver 39.8 ozs., copper 0.15%, zinc 2.2%. Another composite sample assayed gold 0.50 ozs., silver 78.8 ozs., copper 0.2%, zinc 4.3%. These samples were not weighted so are not a true average but they show that the average across about 10 feet in the drill hole is about \$10 in gold and over 30 ozs., silver per ton. The true thickness will be considerably less than the widths in the hole, as the hole makes a fairly acute angle with the dip of the zone but it is distinctly encouraging to obtain these two bands in this hole, at 40' and 100 feet below the values on the level.

D.D. No. 4U has the same set up at D.D. Hole No. 3U and the same strike but dips at minus 55 degrees. This hole starts in Topleyite and passes through the contact quartz vein but does not reach the valuable mineralized bands, dipping too steeply to reach these bands in its depth. The following assays were obtained from this hole:

| | | | |
|------------------|---|-----------------|-------------------|
| At 63 to 64 feet | - | gold 0.07 ozs., | silver 0.44 ozs., |
| 76 to 79 | | gold Tr | silver 3.1 ozs., |
| 80 to 81.2 | | gold Tr | silver 3.5 ozs., |
| 92 to 109 | | gold Tr | silver 2.5 ozs., |

This material is the usual low grade material of the contact which has not carried values at any point.

D.D.Hole No. 5U is drilled from No. 3 X-Cut W., 40 feet west of the Main Drift centre line. The strike is S 62 degrees E and

dip minus 45 degrees. This hole has been drilled to a depth of 115 feet. At 30 to 35 feet a mineralized section was passed through assaying gold 0.12 ozs., silver 0.6 ozs., The section from 35 feet to 42.5 feet assayed gold 0.06 ozs., silver 1.6 ozs., This hole encountered the andesite foot at a depth in the hole of 75 feet.

D.D. No. 6U has the same set up as No. 5U but strike S 82 degrees E and dips at minus 40 degrees. This hole has been drilled to a depth of 119 feet.

D.D. No. 7U strikes N 40 degrees E and dips at minus 40 degrees.

These cores are not detailed yet.

The underground drilling to date, while not yet conclusive indicates very strongly that the mineralized bands carrying good values on the level extend downwards to at least 100 feet below the level, and there is every reason to expect values to extend below the level at which they have been obtained in the drill holes.

A start has been made to extend the shaft down and the shaft should be dropped to at least 100 feet vertically below the present level and work carried on at that horizon. As things look now there is every reason to expect that this work will prove up a block of ground from this lower level to the surface that may be expected to carry commercial values in gold and silver. The values in base metals are not important.

Three shifts are working on the shaft and good progress may be expected.

GENERAL

The small Dry in use previously has been burnt down and a suitable Dry has been erected in a better location.

A Garage for the truck and one car has been erected.

The morale and discipline at the camp are excellent and very good progress is being made in all departments. It is a pleasure to check things over. Mr. Groves, Mine Engineer and Mr. Monk, Mine Accountant, have their work in excellent shape. All maps and records are complete and conditions in all departments reflect the utmost credit on the management.

Respectfully submitted,

(Signed) H.L.Batten.

Mining Engineer.

FRANK H. TAYLOR
PRESIDENT

V. G. OLSEN
VICE PRESIDENT

J. M. TURNER
CONSULTING ENGINEER

L. B. WARNER
SECRETARY-TREASURER

TOPLEY RICHFIELD MINING COMPANY, LIMITED

NON-PERSONAL LIABILITY

REGISTERED OFFICE
SMITHERS
BRITISH COLUMBIA

ADDRESS YOUR REPLY TO
THE MINE
TOPLEY, B.C.

| D.D.H. N° 54 | | | D.D.H. N° 64 | | | D.D.H. N° 74 | | |
|--|---------------------------------|--------|---|----------------------------------|--------|---|----------------------------------|--------|
| Strike | Dip | Length | Strike | Dip | Length | Strike | Dip | Length |
| 56°30'E | -55°E | 115' | H85°E | -40°E | 119' | H50°E | -53°N-E | 128' |
| 30.5-35' | Au As Zn Zn | | Footage Au As Cu Zn | | | Footage Au As Cu Zn | | |
| 30.5-35' | 0 ¹² 0 ⁶⁰ | | 15.9-16.2' | 0 ⁰⁸ 11 ⁵⁰ | | 0-1' | 0 ⁰² 1 ⁶⁰ | |
| 42.5-43' | 0 ⁰⁶ 1 ⁶⁰ | | 23.5-34.5' | 0 ⁰⁸ 0 ⁴⁰ | | 1-6' | 0 ²⁶ 16 ⁶⁰ | |
| | | | | | | 29-32' | 0 ⁴⁴ 38 ⁰⁰ | |
| | | | | | | 33-48.5' | 0 ⁵² 3 ²⁰ | |
| | | | | | | 78-82' | 1 ¹¹ 0 ⁶⁰ | |
| | | | | | | 101-106' | 1 ¹¹ 2 ⁶⁰ | |
| | | | | | | 110-111.5' | 0 ⁰⁸ 0 ⁸⁰ | |
| H° 64. In Toplyite Zone to 75' Then cut Andesite Footwall. | | | H° 64. In Toplyite zone to 20' Then cut andesite zone footwall. | | | H° 74. In Toplyite zone to 114' Then cut andesite footwall. | | |

| D.D.H. H ^o 1-U. | | | | | D.D.H. H ^o 2-U. | | | | | D.D.H. H ^o 3-U. | | | | | D.D.H. H ^o 4-U. | | | | |
|----------------------------|-----------------|-----------------|-----------------|-----------------|----------------------------|-----------------|-----------------|-----------------|-----------------|----------------------------|-----------------|-------------------|-----------------|-----------------|----------------------------|-----------------|-----------------|-----------------|----|
| Strike | Dip | Length | | | Strike | Dip | Length | | | Strike | Dip | Length | | | Strike | Dip | Length | | |
| E-W. | Hor. | 693' | | | N63W | 45W | 233' | | | N80W | 40W | 168' | | | N80W | 35W | 152' | | |
| Footage | Au | As | Cu | Zn | Footage | Au | As | Cu | Zn | Footage | Au | As | Cu | Zn | Footage | Au | As | Cu | Zn |
| 22'-25' | 0 ¹² | 4 ⁶⁰ | Tr | 0 ⁵ | 3'-5.5' | Tr | 0 ¹² | | | 53'-53.5' | 0 ²⁰ | 10 ²⁰ | 0 ¹⁰ | 1 ⁰⁰ | 632'-64' | 0 ⁰⁷ | 0 ⁴⁴ | | |
| 25'-26' | Tr | 1 ⁴⁰ | 0 ¹⁰ | 1 ⁷⁰ | 9'-140' | Tr | 1 ²⁶ | | 5 ⁰⁰ | 57'-60.5' | 0 ⁴⁶ | 52 ²⁰ | 0 ³⁰ | 3 ⁰⁰ | 76'-79' | Tr | | 3 ⁰⁸ | |
| 27'-27.5' | Tr | 1 ⁴⁰ | 0 ²⁰ | 0 ⁷⁰ | 29.0'-30.5' | 0 ⁰¹ | 0 ⁰⁴ | | | 62'-65' | 0 ⁵⁰ | 93 ³⁰ | 0 ³⁰ | 5 ⁴⁰ | 80'-81.2' | Tr | | 3 ⁵⁰ | |
| 55.5'-56.0' | 0 ⁰² | 2 ⁸⁰ | Tr | 0 ³⁰ | 52.5'-54.0' | Tr | 0 ⁴⁰ | | | 74'-75' | 0 ⁰⁸ | 1 ²⁰ | 0 ¹⁰ | 1 ²⁰ | 85.5'-92' | Tr | | 1 ¹⁰ | |
| 68-68.5' | nil | 0 ¹⁰ | Tr | 0 ³⁰ | 57.0'-57.5' | Tr | 0 ³⁰ | | | 150.5'-155' | 0 ⁰⁸ | 3 ¹⁰ | 0 ¹⁰ | 1 ¹⁰ | 72'-99' | Tr | | 0 ⁶⁰ | |
| 72-72.5' | nil | nil | 0 ¹⁵ | 0 ²⁰ | 61.0'-62.0' | nil. | 0 ²⁴ | | | 155'-157' | 0 ⁹⁰ | 114 ⁰⁰ | 0 ²⁰ | 6 ⁷⁰ | 100'-103' | Tr | | 1 ⁸⁰ | |
| 73-74' | nil | nil | 0 ⁰⁵ | 0 ²⁰ | 71.0'-72.0' | Tr | 0 ⁴⁰ | | | 157'-161' | 0 ⁴⁶ | 10 ⁰⁰ | 0 ¹⁰ | 0 ⁸⁰ | 103'-109' | Tr | | 3 ⁶⁰ | |
| 99-101' | nil | Tr | 0 ⁰⁵ | 1 ⁰⁰ | 73.5'-74.0' | 0 ⁰⁴ | 0 ⁸⁰ | | | | | | | | 116'-118' | Tr | | 0 ⁶⁰ | |
| 131-132' | nil. | 0 ⁰⁵ | 0 ⁰⁵ | 1 ⁵⁰ | 124'-125' | 0 ⁰² | 0 ²⁰ | | | | | | | | | | | | |
| 132-133' | Tr | 0 ⁴⁰ | 0 ²⁵ | 0 ⁴⁰ | 161.5'-163.5' | Tr | 0 ¹⁴ | 0 ³⁰ | 0 ⁵⁰ | | | | | | | | | | |
| 194-195.5' | Tr. | 0 ³⁰ | 0 ¹⁰ | 1 ⁴⁰ | 165'-172' | 0 ⁰⁴ | 1 ⁰⁰ | 0 ¹⁰ | 1 ⁴⁰ | | | | | | | | | | |
| 283-285' | Tr | 0 ⁵⁰ | 0 ¹⁰ | 0 ⁵⁰ | 172'-193' | 0 ⁰² | 2 ²⁰ | 0 ¹⁰ | 0 ³⁰ | | | | | | | | | | |
| 470-480.5' | 0 ⁰² | 0 ⁴⁰ | 0 ¹⁵ | 1 ²⁰ | 193'-194' | Tr | 1 ⁴⁰ | 0 ²⁰ | 0 ¹⁰ | | | | | | | | | | |
| 625-626' | Tr. | 0 ⁰³ | | | 197'-198' | nil | 0 ⁴⁰ | 0 ¹⁰ | 0 ¹⁰ | | | | | | | | | | |
| 627-628' | Tr. | 0 ⁰⁶ | | | 199.5'-201' | 0 ⁰² | 1 ²⁰ | | | | | | | | | | | | |
| 658-658' | 0 ⁰² | 0 ⁴⁰ | | | 201'-206' | Tr | 0 ³⁰ | | | | | | | | | | | | |
| 663-665' | 0 ⁰¹ | 0 ³⁰ | | | 206'-208' | Tr | 0 ⁸⁰ | | | | | | | | | | | | |
| | | | | | 209'-210' | Tr | 0 ⁴⁰ | | | | | | | | | | | | |

H^o 1-U. Cross Cut hole in andesite for full length. Collar at Face H^o 2XCE

H^o 2-U in Andesite Footwall to 125' 125'-233' Tophylite and low grade qtz. vein.

H^o 3-U in Tophylite zone for full length. Cut two well mineralized zones at 40' and 100 ft respectively below present level.

H^o 4-U. In Tophylite to 130' - Cut foot wall andesite and low grade foot wall qtz. vein at 100'

ADDRESS YOUR REPLY TO THE MINE TOPYLEY, B.C.

REGISTERED OFFICE SMITHERS BRITISH COLUMBIA

TOPLEY RICHFIELD MINING COMPANY, LIMITED

NON-PERSONAL LIABILITY

FRANK H. TAYLOR
PRESIDENT

J. G. OLSEN
VICE PRESIDENT

J. M. TURNER
CONSULTING ENGINEER

L. B. WARNER
SECRETARY-TREASURER

No.2.Drift south.

Driven 70 feet off No.2. East Crosscut. It follows a narrow vein, which contains much Zinc and some Lead, with some very good values in places. It lies in the Andesite footwall, back of the shaft, and may prove to have some importance when its relation to the main veins is worked out.

No.3.Crosscut west.

Extended 70 feet, to a total of 125 feet. The original drift was in good ore, but the extension ran into faulted ground and was discontinued. Due to the faulting this crosscut, which appears to be really a drift on an angling vein, seems to have swung too much to the South, and it will probably not be difficult to pick up the ore here again. A short raise from this crosscut was driven 15 feet on a bunch of rich ore, which occurred in the back of the crosscut it was not continuous.

No.4.Crosscut west.

Extended 75 feet, to a total of 135 feet. This was a continuation of the old "low grade drift". Ore was continuous in this drift, which ends in the fault. The ore was rather low grade and altered. A diamond drill hole showed much better values a short distance below the level (Hole No.7U) It will therefore probably be better to continue development of this vein from the 200 ft. level, where better values may be expected.

MAIN shaft.

Sunk 73 feet, to a total of 88 feet below the 100 foot level. Much water makes progress somewhat slow. The Contact vein shows in one corner of the shaft, but is gradually passing out into the hanging wall, owing to the angle of the shaft, so that its full dimensions are not shown in the shaft.

DIAMOND DRILL HOLES.

Eight holes, totalling 3649 feet of hole, were drilled from the surface. These yielded a lot of information in regard to Geology and low grade or mineralized zones, but, in the light of later development were often unfortunate in passing by or between the ore zones at short distances. This was partly due to the difficulty of finding satisfactory places to set up on the surface, on account of the heavy overburden, whose depth could not be foretold in advance.

Hole No.1. about 600 feet North of the shaft, struck nine feet of vein, at about 700 feet vertically below the surface, of which 2 feet assayed over \$16.00 in Gold & Silver. This seems to belong to the East Vein system, in the Andesite.

Holes No.2 and 3 were driven to cut the East vein at depths of 100 and 150 feet, but got low values in too many places to define the vein with certainty.

Hole No.4. the only surface hole which penetrated the ore zone in a promising place, struck ore of fair grade at 183 feet depth, about 100 feet North of the shaft, with lost core and broken ground and low values enough to be inconclusive.

Eight more holes were drilled from underground setups. These totalled 1847 feet in length. Three of these showed good ore and good widths, the results being given in the main report under holes 3U, 7U, 8U.

Hole No.1 U was drilled horizontally 800 feet Easterly from No. 2 East Crosscut, as a general prospect hole. It struck low grade values at 25 feet and 2 feet of zincy ore at 513 feet. This hole was in the Andesite footwall rock.

The remaining short holes showed low values in places, but, due to lack of knowledge of the dips of the orebodies, they were chiefly valuable in a negative way, as showing where the ore did not dip to, and in giving geological information. They were prospect holes and served a useful purpose.

TOPLEY RICHFIELD MINE
Notes re Underground Development in 1926.

No. 1 North Drift. (North contact Drift)

This drift started at 250 ft. North of the shaft, on the Andesite contact zone, and was extended 563 ft. during the year. It followed a quartz or silicious vein, heavily mineralized with iron pyrite in places, which attained a maximum width of 25 feet, at the 190 ft. point. The average values proved to be quite low grade, though some good assays were obtained. The last 220 ft swung to the Northwest and is possibly on an angle vein, though the quartz mineralization persists nearly to the face.

No. 6. Crosscut East.

Driven from the 190 ft. point in No. 1 North Drift, for 143 ft. westerly. showed strong Northwesterly fissuring or faulting, especially near the face, but no ore outside of the 25 feet mentioned above. Possibilities still lie beyond the face, which may be explored later on.

No. 2. Rake.

Driven 135 feet to the surface, for ventilation, from the 230 ft point in No. 1. North drift. It showed a strong quartz vein for 50 feet, when the quartz either petered out, or passed into the hanging wall, on branch fissuring.

No. 4. East Crosscut.

Driven 567 feet Easterly from the 340 ft. point in No. 1. Drift North. This was driven to intersect the East vein at a depth of about 150 ft. It cut several narrow quartz veins from which occasional high assays were obtained. The East vein has not yet been positively identified here, but at the 390 ft. point a quartz vein was crossed, about 15 inches in width and in about the right line for the East vein, on which No. 3. North drift was driven. The balance of the crosscut is in dark Andesitic footwall rock, with small quartz stringers.

No. 3. Drift North.

Driven 227 feet on the quartz vein above mentioned, which was mostly under 2 feet in width, ending at a point nearly vertically under the surface cut on the East vein, from which a number of high assays, over good widths, had been obtained. Zinc assays, up to 13%, were obtained in the drift, with low gold and silver values. Copper also occurred up to 3%. Development here will require to be resumed, when drills are available again.

Surface cut on East Vein.

This cut is about 130 ft long. It showed a strong quartz vein, running northerly, with a nearly vertical dip, and widths up to about 4 feet. Mineralization was unusually heavy in Zinc and Copper, with some Lead, and gave high assays in places and will warrant further development when plant is available.

No. 5. Crosscut East.

This is really a drift on a cross vein, which has a flat dip to the South, and may prove important later on. Its dip is towards the good ore below the 100 ft level, but it is interrupted by a fault, as shown in a short winze sunk on it. The crosscut extends 112 feet along this vein, showing variable widths all the way, much altered and with low values, but it appears to be persistent, up to 3 ft. wide, and may contain good ore on the 200 ft. level. It is strong in the bottom of No. 1. winze, where it is out off by the fault.

No. 1. Drift South.

Total length 465 feet. This drift follows the contact vein southerly for 150 ft. showing widths up to 10 feet, with mostly low values, the vein being much altered or leached. At the 150 ft. point it is cut off apparently by a strong fault. The drift follows Easterly in the general direction of the fault to the face and encountered a further lens of quartz, some 70 feet long, which may possibly be a faulted section of the vein, but it is possible that further prospecting would find the continuation of the vein beyond the fault mentioned, and South of it. This will probably be better done on the 200 ft. level. At the 225 ft. point the small zincy vein, of No. 2. South drift, was crosscut which indicates that this little vein has strong continuity and offers promise in depth, as it contained good values where found in No. 2. East crosscut in 1927.

unravelling, and development will become more productive and results speedier as time goes on.

On November 24th, lateral development on the 100 ft. level was stopped for the present, having reached sufficient extent to prepare the way for deeper development, and shaft sinking was concentrated on. Diamond drilling was also stopped to be recommenced from the 200 ft. level, when that is opened up. The 200 ft. level should be reached and drifting commenced on that level early in February 1929. This plan is good policy as the stage has been reached where development can be more effectively carried on from a lower level, and where development in depth should be the objective for a time, in order to block out a portion of the veins, so as to bring the mine into production even on a small scale, as early as possible, minimizing capital requirements by some returns on ore shipped.

It seems highly probable that some ore of shipping grade will be found on the 200 ft. level. One drill core shows a value of \$84.00 in gold and silver, over $1\frac{1}{2}$ ft at this level, in addition to bodies of milling grade with higher grade sections, so that direct shipments may be expected in 1929.

It is proposed to extent development on the 200 ft level over a length of only 300 to 400 feet prior to sinking again to the 300 ft. level. According to diamond drill results it may become advisable to continue sinking to the 400 ft. level before again resuming long lateral development. On this plan the 300 ft. level will probably be reached and partly developed during 1929, when more definite reports and plans will become possible, with some more definite figures in regard to ore.

It is not likely that any major additions to plant will become advisable during 1929, except a new hoist, but near the end of the year, consideration of larger plant and speeding up of development, towards milling, may be in order.

In regard to the more distant future, the Southern and Northern extensions of the property probably cannot be fully explored for many years. Heavy overburden makes surface prospecting of minor value. The nature of the ore and the complex structure seems unsuitable for electrical prospecting, while geological studies have not given results sufficiently definite to be of great assistance at the present stage of development. Diamond drilling has not proved ^{fully} satisfactory from the surface and the results have been somewhat inconclusive, whereas underground holes have been more satisfactory, quicker and cheaper. It is therefore doubtful if the extensions in length can be economically proved by diamond drilling from the surface. One attempt to crosscut the Southern extension by drill hole No. 8. failed, due to caving at a depth of 400 feet in the hole.

A program of expansion of underground workings, when we have found the best ore horizon, seems to be indicated, and this operation will necessarily be somewhat slow, if sure.

In regard to depth, the ore on the 100 foot level still strongly shows the effect of surface oxidation, and the ore found shows ~~the effect of surface~~ in drilling below this level a marked improvement in character, as in values. In depth also it is reasonable to expect a tightening of the ground. The 200 ft. level will probably be better than the 100 ft level, and if this improvement continue to the 300 and 400 foot levels, which would not be surprising, the future of the mine will at least be fairly assured, though it may take a long time to develop to its maximum capacity.

In regard to management, I can assure your board that I have no criticism to offer. Efficiency, economy and lack of extravagance are noteworthy. Real mining is going on. The Engineering and Assaying departments have, after some early difficulties, been adequately manned, a resampling program has been nearly completed and mine plans and assays are now on a satisfactory basis and of reliable character.

For your information, and for purposes of record, I attach hereto a series of notes, covering the individual operations and diamond drill holes in more detail, which in addition to the above report, completes information in regard to all developments of any importance during the year 1928.

The whole is respectfully submitted.

Signed J.M. TURNBULL.
Consulting Engineer.

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934-78

JOHN M. TURNBULL.
Mining Engineer.
Vancouver.

C O P Y.

The Board of Directors.
Topley Richfield Mining Co. Ltd.
Smithers.

January 7th. 1929.

Gentlemen.

I beg to submit the following report, covering development work done, and results obtained, at your Richfield mine, Topley. B.C. for the year 1928.

The following table summarizes the footage of development work done to date, and for the year 1928.

| | | |
|-----------------------------|--------------------|----------------|
| Footage prior to Jan. 1928. | | 850 feet. |
| 1928 Drifting. | | 1,396 " |
| Crosscutting | | 1,102 " |
| Raising. | | 150 " |
| Winzes. | | 25 " |
| Main shaft sinking. | | 73 " |
| | Total | <u>3,576</u> " |
| 1929 | Surface trenching. | 150 " |
| | Diamond drilling. | |
| | From Surface. | 3,649 |
| | Underground. | <u>1,847</u> |
| | | <u>5,496</u> " |

The costs, for labour and supplies, averaged under \$8.00 per foot, which, under the circumstances, must be considered very creditable. Diamond drilling averaged \$3.48 per foot. Most of the above work was done with the original 50 H.P. plant, but on Oct. 16th, a second 50 H.P. unit, semi-diesel engine and compressor, went into commission, which will permit of an increased rate of development during 1929.

In general, the results of development to date may be considered as satisfactory and up to expectations. The prospects for ultimate success have been greatly improved by the work done. Good values have been found at various places, included in a length of 900 ft, a width of 100 ft, and at a maximum depth of nearly 700 ft. Many of these are not yet correlated, and some are merely good indications at present; but, in the block of ground near the shaft, diamond drilling has been intensively done, and has indicated a material improvement in values, below the 100 ft level, and a fresher character of ore, which point to improvement in depth, and suggest that deep development, in this section at least, will have very satisfactory results, and the opening up of some straight shipping ore as well as bodies of milling grade. The following assays from drill cores, in this section, will indicate the objective of present sinking operations.

| | | | | | |
|-------------|------------------------|-----|----------|-------|---------|
| Hole No. 3U | Depth below 100' level | 42' | Core 6½' | Value | \$50.90 |
| 3U | | 104 | 5½' | | \$29.25 |
| 7U | | 31 | 17½' | | \$14.40 |
| 8U | | 88 | 15½' | | \$11.00 |

These cannot be satisfactorily correlated yet, but appear to represent at least two veins, or ore zones. Several other low grade zones will-produce wide or narrow, have been located in the various tunnels, or drill holes, and it is probable that these zones will produce workable ore bodies, in length or depth, on further development. The North contact vein has been the most persistent vein, with widths up to 25 ft. but the values have been low on the 100 ft. level, and may improve in depth. On the whole development has a very promising outlook.

Mineralization is evidently on a much larger scale than it appeared to be a year ago. While this offers the possibility of much larger ultimate tonnage, it also indicates the necessity of development on an equivalently large scale, over a period of years, though we expect to be able to block-out a portion of the tonnage definitely during 1929. The complexity of the vein and fault structure, which occur here, make development appear very slow in getting results, though this condition will improve greatly as the structure is

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