

Kellogg, Idaho, Sept. 29, 1908.

Mr. F. W. Bradley, President,
Bunker Hill & Sullivan M. & C. Co.,
Kellogg, Idaho.

Dear Sir:-

These opinions, based upon three weeks study of the surface and underground conditions in a portion of the mining property of your company, are necessarily tentative and open to future modification.

A band of mineralization, possibly 300 ft. in width, extends for a distance of at least 2000 ft. through parts of the Phil Sheridan, Blue Bird, Turkey Buzzard, Bottom Dollar, Chestnut, Sullivan, Small Hopes and Lackawanna claims and probably continues through the Jackass claim to the northwest and the Sullivan to the southeast. This is known as the Phil Sheridan vein and its strike is N. 50° W. to N. 60° W., with a dip of about 50° to the southwest. The characteristic features of its mineralization are the abundance of silica and the sulphides of iron and the scarcity of the ores of lead and zinc. It is also said to carry small amounts of gold. This iron sulphide carries but little silver.

Erosion and other dissecting agencies have left this vein - far harder than the surrounding quartzites from its silicification and cementation by the iron solutions - as a

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prominent and almost unbroken ridge, extending across Milo Creek and up both the mountain slopes on its sides.

Later, a system of faulting cut through this vein at an acute angle and formed what are known as the various "slips" in the mine. This faulting system has a strike of about N. 38° W. and a dip, as a whole, of about 40° to the southwest. The dips of its various fissures, as well as their strikes, are most irregular and form a complicated network, both in plan and section. Some are strong and persistent for many hundreds of feet, as with the "Foot-wall" and the "Cate", but end or die out where parallel slips take up the line of motion. Cross fractures are plentiful and the bedding planes of the quartzites allow lines of motion along their surfaces also. The vertical throw of this faulting may have been considerable, but horizontally it was not sufficient to dislocate the sulphide ore-body of the Sheridan vein, as the pyrite in place is found on both sides of the "Cate" slip at several points along its strike for a distance of 300 ft. Allowing for the acute angle at which the Sheridan vein is cut, a throw horizontally of more than 300 ft. seems improbable. In my opinion, the southwest wall of the fault moved to the northwest, but this opinion is based on one observation only and is not at all conclusive.

Later, mineralizing solutions, following up on the lines of weakness formed by the faulting, left their burden by metasomatic replacement and in some cases actual vein building and formed the workable ore bodies of the property. When the

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faulting movements formed a considerable amount of "gouge", or finely ~~concentrated~~ ^{concentrated} rock, along the slips the impenetrability of this material caused the solutions to follow along it and ore-bodies lying either above or below, but along the slips, were the result. Along lines of cross fracture ore often continues from one slip to another.

This ore deposit is essentially different in composition from that of the Sheridan vein, containing but little pyrite and much lead with some zinc and valuable amounts of silver, but no gold. Many minutiae in appearance stamp these ore-bodies as of different periods.

Where the faulting has crossed the Sheridan vein and in the neighborhood the later mineralization has so mixed with the earlier that many specimens, or even considerable areas, look as if the lead and iron sulphides were of contemporaneous origin, - as in the Sullivan ore-body, - but where the limit of the strength of the galena deposits is approached, - as in the Bryan stope, - the pyrite resumes its characteristic appearance.

Recommendations: That the ore body of the Sheridan vein has not been developed is due to its lack of commercial value. Its perfect connection with the ore-bodies on the lower levels of the mine and the prospect of possible litigation, affecting these ore bodies, make it advisable that it now be thoroughly explored in a northwesterly direction.

Surface indications at and above the stratigraphic level of the upper Blue Bird tunnel seem to make the cropping

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of the vein above that point very doubtful. The St. Regis formation is probably entered in this neighborhood and no veins show at the surface in this series here. Nevertheless, I believe that this upper Blue Bird tunnel should be continued, in its own direction, as far as the east side line of the Jackass extended, if necessary. If ore be found the evidence will be very valuable and if not it will only show that the working is too high stratigraphically. Its present mute testimony of failure to find the vein is as damaging as any further development can possibly be.

The lower Blue Bird tunnel should be continued - the right branch - by cross-cutting to the south for perhaps 50 ft. and then drifting northwest on the strongest seam farthest south.

The Phil Sheridan discovery tunnel should be driven on the vein along the southerly limit of the ore body. This is most important and a raise from the lower Blue Bird tunnel - when this is driven far enough - to the Phil Sheridan tunnel on ore would establish absolute continuity through the Phil Sheridan raise to #4 Bunker Hill and thence downward to the deepest ore bodies opened.

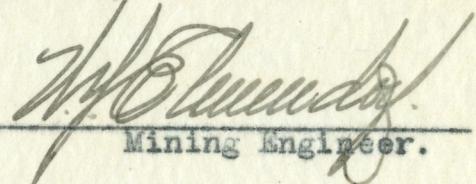
If the vein, as shown in this development, goes through the end lines of the Jackass claim, I think that the ownership of the Bunker Hill ore-bodies will be settled for all time. With the older locations on the older vein and possession of the surface and workings, such ownership would seem clear.

The work of driving on the strongest north slip in the

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right hand drift of the Tyler is an excellent development and should give the company another perhaps as strong position for defense in the event of litigation as the Sheridan developments.

Respectfully yours,



Mining Engineer.