REPORT ON

PROPOSED CONSOLIDATION
OF MINES IN THE

TELLURIDE DISTRICT
COLORADO

BY

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SMUGGLER-UNION:

This mine has been worked continuously for 55 years, during which period the total production (net sales) has been approximately $66,000,000. The property, including the Humboldt group, covers the main vein for over two miles; and continuous stopes extend along it for 9000 feet, - the longest distance on any vein in the world. There are subordinate crossing and intersecting veins, some of which have been very important producers.

The vein-system traverses andesitic flows, tuffs, and breccias, 3000 feet in thickness. Above this, the country is capped by rhyolite, in which no ore is found; below, the veins pass into conglomerate. What will happen in that formation, is a matter for speculation. The probability is that their gold and silver content will be reduced; there is some reason to think that the base-metal content, lead and zinc, may be much higher. All veins in this district vary very much in richness, as they traverse different layers of the volcanic rocks, which lie nearly horizontal; characteristically, the veins tend to be poor when they pass through siliceous beds, and rich when they pass through more basic beds.

The Smuggler-Union vein is largely worked out, above the Bullion Tunnel level, the old main opening. The vertical height so stope out varies from 900 feet, in the Smuggler and Union claims, to the surface; and 1200 to 1500 feet in the Sheridan and Mendota claims, where values cease at an overlying capping of rhyolite.

Below the Bullion Tunnel, the same geological formation continues for 700 or 800 feet further. The Pennsylvania Tunnel has been driven at a vertical depth of 660 feet below the Bullion; and is connected with the Bullion Tunnel by a shaft. In general, the ore in this block of ground is wider, but of lower grade; but there are some places where it is of good grade, and shows free gold.
The Pennsylvania Tunnel has been driven along the vein for 5000 feet; but the ground between it and the Bullion has been but little explored. It seems safe to estimate an unworked tonnage in this block of ground of 500,000 tons; and in view of the greater thickness as compared with the upper workings, this figure may be largely exceeded.

The Smuggler-Union vein pinches and swells, in places being very narrow, in other places wider. Of the main vein, the average width has not exceeded two to two and a half feet. Up to the end of 1902 all mining was done by hand; blasting in waste and filling the stopes with waste rock, then shooting the vein down separately. After the use of the air-feed stoping drill became general, about twenty years ago, ore and waste were blasted together, making wide stopes, but necessitating high expense for timbering, and mixing the ore with a large excess of waste rock, much of which was sorted out at surface. Of course, the fine waste cannot be sorted out. Experience in other countries, and particularly in the Transvaal, where narrow veins are mined, proves that the former method is generally preferable; and it is standard mining practice. The ore costs more per ton; but less per ounce of gold secured.

It is believed that the secret of success in the Smuggler-Union hereafter will be careful underground mining. Some of the vein must be stripped; but a great part can be mined by the "shrinkage" system, making narrow stopes in the vein itself; but being more careful than heretofore to avoid breaking waste without absolute necessity. Stopes can be carried just as narrow, and veins can be stripped just as clean, by machine as by hand; but it requires more skillful planning and supervision. Tonnage will probably have to be reduced.

I am assuming that the Humboldt and Sailor's Fortune claims, which have been worked for many years as part of the property, are owned with it; if not, they should be secured. The orebody changes in character, from a predominately gold-bearing to a silver-bearing ore, as you proceed in this direction (north); but is virtually continuous.

To the south, the vein passes into the Ajax group of the Japan Company, where it is wider and probably low-grade; but almost unprospected. This should be acquired.

The Smuggler-Union property is thoroughly equipped with hydro-electric plant, sump plant, and concentrating and flotation mills of 800 tons daily capacity. I think the capacity of the mills is larger than the mine can produce, if the ore is kept clean. This property is therefore properly to be regarded as the nucleus of the proposed consolidation; the excess milling capacity being made use of to handle the ore from adjacent mines.

According to Mr. Robert Livermore, who succeeded his brother-in-law, Mr. Bulkeley Wells three or four years ago, the mine was profitable during the first years of his management; the final shut-down being due to a disastrous fire which destroyed the buildings and tramway terminal at the Pennsylvania Tunnel. It is necessary...
tated hoisting everything through the shaft to the Bullion Tunnel; at a total cost, as I am informed, direct and indirect, of 75 cents per ton. This added cost, which by ill-luck coincided with a drop in the value of lead and a local falling-off in values, and the not unnatural unwillingness of stockholders, who had received no dividend since 1902, to furnish money, resulted in the shut-down.

The Commissioners of San Miguel County have published a statement that according to the Company's affidavits filed with the County Assessor, operations during the last 8 years have shown a net balance of $800,000 (this figure is quoted from memory). But this would not include overhead, taxes, or depletion; and the first two items have always been high.

What is certain is that the Smuggler-Union, throughout most of its history, has been a milch-cow for persons connected with the management (since my brother's death, in 1902, in the hands of one family) and for the local community. The result has been that whereas the two other great mines of the district, - the Tomboy and the Liberty Bell, - finally closed down after the ore was exhausted, with long and very profitable records, the Smuggler-Union, excepting for a short period under the management of the late Arthur L. Collins, and to a less degree under that of Mr. Livermore, has been a by-word for inefficiency and extravagance; and its much greater output has been swallowed up without dividends to the stockholders.

JAPAN-FLORA:

This group includes the Ajax property, which covers the outcrop of what is probably the Smuggler-Union vein for a mile and a half to the south. Its principal property is however a solid block of claims, 180 acres in area, lying between the old and "new" Tomboy properties; both of which are now practically exhausted. This block of claims is opened by the Japan lower Tunnel, the entrance to which is in Marshall Basin, several hundred feet above the Bullion Tunnel.

The property contains numerous veins, most of which are unprospected. The two veins which are partially developed down to the lower Tunnel level are the Japan and the Flora. The former is narrower; the latter about the same average thickness as the Smuggler main vein. The principal difference is that the known ore of the Japan group is richer; and contains, in addition to gold and silver, much lead and zinc.

The workings were sampled, more than twenty years ago, by many well-known engineers; among whom may be mentioned F. W. Royer, L. S. Noble, Beals and Whittle, F. F. Sharpless, and Harry J. Wolf. Their estimates vary, but within reasonable limits, and with a general tendency to increase with later date. The last estimate was that of Wolf, who estimated tonnage proved as 96,000 tons; net value (profit) $626,000. Assays are not always given in detail; the
best average I can obtain from such of the reports as give detailed
assays is 0.47 oz. gold, 13.5 oz. silver, and 8% lead. The cost of
mining, even allowing for the gain of using stoping machines (then
not invented) in place of hand work, would probably be higher than
estimated in the reports; on the other hand, these value the lead at
from 50 cents to 46 cents per unit. The price paid at Durango is now
$1.03 per unit, and it is likely to go much higher. I think we are
safe in assuming that increased value of lead will fully take care
of any increase in costs.

The assays listed by Royer and Noble indicate that lead-
bearing stretches not included by them as ore averaged about as
follows: gold 0.14 oz., silver, 6.6 oz. per ton, lead 7.5%. It
seems that in view of the present price for lead such ground might
perhaps now be included in the ore-reserves; and in general that the
veins in the property which contain high lead but relatively low
gold and silver values, and which used to be regarded as of little impor-
tance, should now be developed vigorously.

From these assays, it seems that most of the ore contains nearly
as much zinc as lead. I remember that both galena and blende are
generally crystalline and coarse, and that little pyrite is present.
With present-day selective flotation, we may take it for granted that
the zinc could be separated, and would add materially to the net
value of the ore.

Apart from its proved ore-reserves, the Japan group seems to
possess large possibilities. A short aerial tramway would connect
the portal of the Lower Tunnel with the terminal of the Bullion tramway.

BLACK BEAR:

This property contains very large ore-reserves, of
complex gold-silver-lead-zinc-copper ore. It could easily be connected
with the Smuggler-Union mill by aerial tramway, and there is reason
to believe that at the present time it can be secured on very
reasonable terms.

When last operated, the mill heads of the Black Bear averaged
as follows:

<table>
<thead>
<tr>
<th>Gold</th>
<th>Silver</th>
<th>Lead</th>
<th>Zinc</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.16 oz.</td>
<td>2.31 oz.</td>
<td>2.57%</td>
<td>4.67%</td>
<td>0.76%</td>
</tr>
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</table>

I am informed, on what I consider good authority, that the
mine contains over 300,000 tons of such ore, proved or partly proved;
and that as the vein will average 7 feet wide, it can be mined
cheaply. Such ore is low-grade today; but its value is almost certain
to increase, with changing economic conditions.

PIONEER GROUP:

Nearly a year ago I made, on behalf of people at
Rico, a hasty examination of this property, between the Bullion and
Pennsylvania tunnels, on the Ajax Mountain side of Marshall Creek.
No estimates of tonnage were justified; but there is every reason to
think that a considerable production could be made of lead-zinc ore,
carrying some gold and silver. As in the case of the Ajax vein, the
vein is wide enough to ensure low mining costs. A short aerial tramway
would deliver ore from the Lower Tunnel of the Pioneer to the terminal of the main tramway from the Pennsylvania Tunnel to the Smuggler mill.

N. W. H. JR:

This is an undeveloped and unworked patented claim, which lies between the Revenue group and the Argentine group, which were long successfully and profitably worked by the Tomboy Company; and covers a length of 1500 feet on the same vein. It is intersected, near the middle, by the Japan Lower Tunnel, and could be cheaply developed from it. Apart from this, I understand that it is unprospected. Its position, between two long and productive sections of the same vein, suggests a probability that it also will contain profitable orebodies. It would perhaps never have justified equipping as a separate mine; but in connection with the proposed consolidation it seems likely to produce a considerable tonnage of ore, at low cost.

CIMARRON AND COLUMBIA GROUPS:

These properties cover two and a half miles of the course of a vein which runs between the Smuggler-Union and Tomboy or Black Bear vein-systems, and which in places has been very productive. They include one undeveloped claim between the Argentine (Tomboy) and Black Bear mines, on the same vein. The Tomboy had ore continuously up to the sideline; and the chances of its continuance into this claim are particularly favorable. If these properties can be acquired on reasonable terms, they should be included.

In general, the proposal contemplates the consolidation of most of the remaining productive ground in the Telluride district, and its utilization in connection with the existing Smuggler-Union equipment, which can be done readily and comparatively cheaply, because of the local topography. It means taking advantage of the feeling of depression at Telluride which has naturally followed the loss of its perennial meal-ticket. Starting with a clean slate, mistakes can be avoided, costs can be cut, and properties purchased on a bed-rock basis. The Smuggler mills and power-plant should be of ample capacity for all that is left in the area; and operations can be resumed on a business-like basis to the benefit of those who are able to take advantage of the situation.

The ores of the district contain gold, silver, lead and zinc. Of these, the relative economic value of gold and lead are almost certain to improve; in the case of lead, in the near future. A study of the economics of metal production by the writer, a brief printed summary of which is enclosed herewith, gives the reasons for this conclusion, which is becoming generally accepted by well-informed engineers and economists.

Respectfully submitted.