

0820 0036

*Pioneer Mine*

(218)  
Item 36

AMERICAN  
ZINC CO.,  
WALTER G.  
SWART FILES,  
NEVADA  
FOLDER 377



55 CONGRESS STREET,  
BOSTON.

COPY.

#52 Journal Bldg., Boston, Mass.

April 28, 1909.

For

Judge F. J. Hutchinson,  
#50 Bromfield St.,  
Boston, Mass.

My dear Judge,-

Is the following subject matter anything that will be of interest to you or to any of your clients, financially able to aid in handling the enterprise? The proposition is submitted to me by an old and intimate friend of mine, Mr. William B. Milliken of Denver, a mining engineer and expert of more than ordinary ability and of high reputation. He has built some of the largest mining reduction plants in the West, and is classed among the best milling and mining engineers in the country. Any of the following statements are readily capable of verification.

The camp is Pioneer, in the Goldfield district, Nevada, ten miles north of Rhyolite on the Tonopah & Tidewater Railroad, and two miles from Springdale, the nearest station. This camp where the property is located, is practically three months old, has 2,000 people, two newspapers are being published, a post-office, Western Union and Postal telegraphs are on the ground, auto stage lines in operation, and 20-mule teams carrying eight tons to the load are hauling ore day and night under guard. The ore which these teams are hauling to the railroad is of an average grade of \$100 per ton, and \$100,000 worth was shipped during the month of March. The present production, according to a report by wire to Denver and repeated here on April 23rd, is at the rate of \$7500 per day. "All of the ore so far shipped has come from within the lines of the Indiana claims extending vertically downwards." The Indiana is the property which Mr. Milliken now owns, known as the Indiana Nevada Mining Company. Adjoining this property is the



Pioneer mine which has a shaft driven on Pioneer ground to the 110, 156, and 210-foot levels respectively. These levels are driven into Indiana ground where the ore was found. At the 210-foot level they have 14 feet of ore that runs \$200 per ton and 21 inches that runs \$600 per ton, since proven to be 36 feet wide with an average of \$100 rock in gold as broken down.

Quoting Mr Milliken's letter from Denver of March 10th he states as follows:-

"The first strike was made at the 110-foot level and in sinking a winze 55 feet deep they shipped about \$90,000 worth of rich gold ore."

In Mr. Milliken's letter from Pioneer, Nevada, of March 22nd, he states as follows:-

"We have granted six leases on the Indiana property and to some of the most successful mining men in Nevada. The Engineer's Leasing Company which took \$1,080,000 in four months from the Florence at Goldfield, have taken an eighteen months' lease, 25% royalty, and agreed to sink a double-compartment shaft 500 feet timbered with 8x8 timbers. They will put on a 50-H.P. hoist."

These six leases could have been leased over and over again, there being so many applications. The most desirable block of ground has been reserved for company account on which Mr. Milliken is sinking a double-compartment shaft day and night, which on April 8th had but 100 feet more of sinking before reaching the ore body directly beneath it and the same body from which the Pioneer is extracting and carrying away to an amount exceeding at the present time \$170,000 per month. The blocks leased do not include the one reserved for the company account, that being the one nearest the shaft sunk on the Pioneer, which is within 73 feet of the dividing line between the Indiana and Pioneer claims and within 159 feet from where he is sinking a shaft on the Indiana block reserved for company account



Mr. Milliken's confidence in the Indiana claims is further shown in the fact that on March 10th he had put \$20,000 of his own money into the proposition and had agreed to put \$24,000 more into the treasury of the company. He has since put in many thousands more in sinking the shaft above referred to and in meeting further payments.

Mr. Milliken claims that the apex of this vein, from which the Pioneer is removing these great values in ore, is on the Indiana claim, and it is therefore of the greatest urgency that his shaft should be sunk on the Indiana property as rapidly as possible, which requires the immediate expenditure of considerable money to accomplish. When this body of ore is reached, the proposition will then be self-supporting with enormous profits. The claim that is made by Mr. Milliken, that this ore referred to is being taken from his property, can be readily proven when he has sunk to the 110-foot level and drifted toward the Pioneer shaft thirty or forty feet, at which time the Pioneer can be legally enjoined and the values, shown to be taken from this property, recovered.

This corporation is incorporated under the laws of Wyoming with a capital of \$1,000,000, same number of shares, par value \$1.00. There is in the treasury 400,000 shares and outstanding 600,000. The outstanding stock is pooled.

My proposition is this-- I can sell control of this property for one hundred and fifty thousand (\$150,000) dollars, and there will be twenty-four thousand (\$24,000) dollars placed in the treasury for the benefit of the corporation for development of other purposes.

Mr. Milliken's resources have been largely drawn upon in the payments which he has already made, and in anticipation of the outlay necessary to sink the shaft, he has communicated with me to render him assistance in financing its development, and I have taken over some of the treasury stock



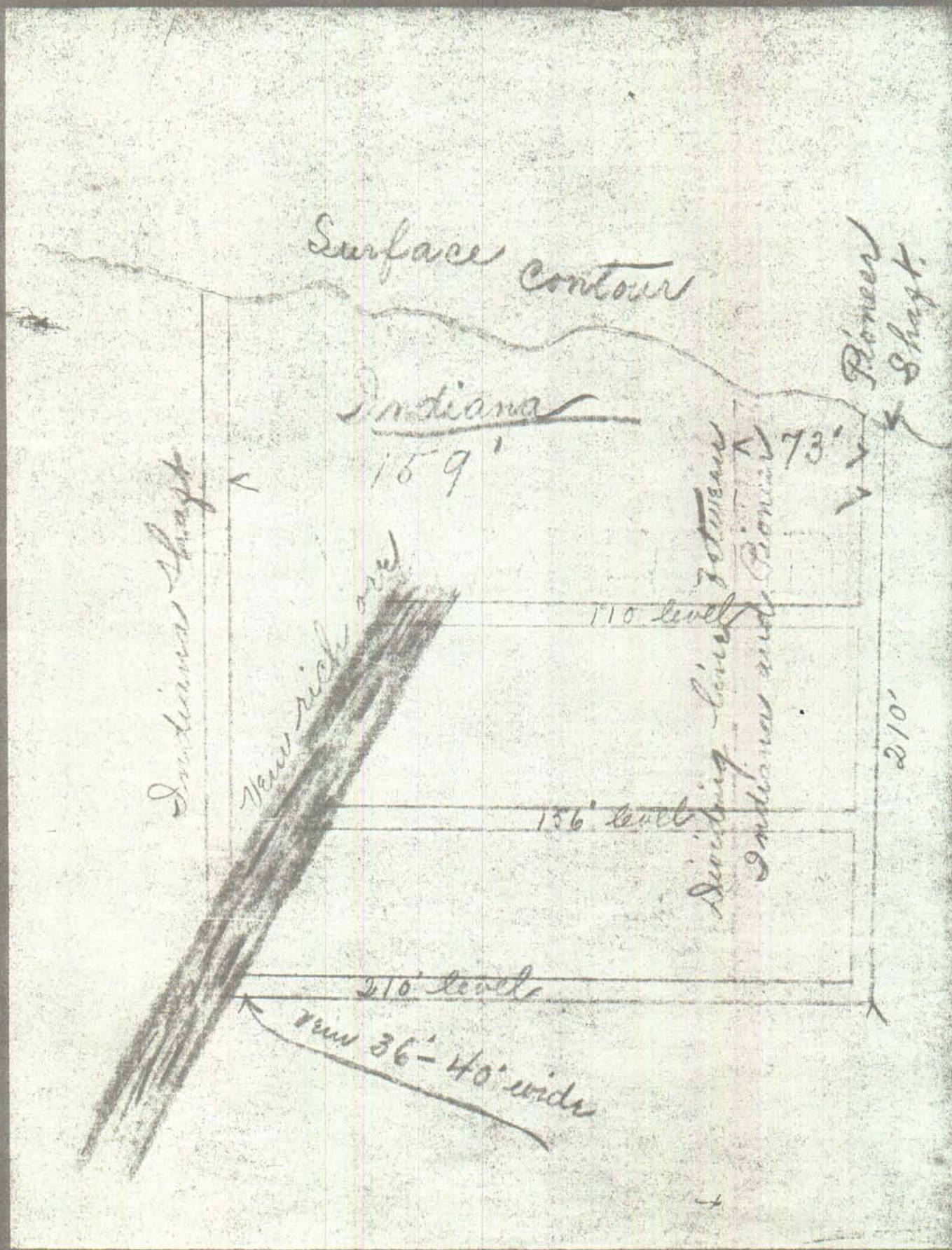
- 4 -

personally. In selling the control of said company for \$150,000, payments can be made one-fourth in cash, the balance in thirty, sixty and ninety days, and the first payment on or before May 12 next. He would prefer to sell about 200,000 to 300,000 shares of stock and not the control, yet I have arranged with him to sell control.

Judge, you know my experience in the business, and knowing what I do of gold mines, there is not one in five thousand to which I would devote any attention, and were it not for the fact that I am heavily interested in a copper mine which is taking a great deal of money and almost my entire attention, I would personally go to Mr. Milliken's assistance with all the funds I could command, as I believe it an opportunity of a life time to make a fortune, because, Judge, bear in mind that this ore body is one of the largest and richest ever uncovered in the State of Nevada, and Mr. Milliken claims that every pound of ore now being extracted is taken from the Indiana property, furthermore that at least 1200 feet of this vein (now proven to be one of the richest ever opened in the State of Nevada) is absolutely on the Indiana ground and uncontested. Knowing Mr. Milliken as I do and his experience as an engineer, when he makes the statement that he owns also every pound of ore now being extracted by the Pioneer (\$7500 per day), you may rest assured that he knows what he is talking about, and that 250 feet approximately about which there may be a contest that Mr. Milliken will undoubtedly be able to show the apex and not only prevent further work on that contested section, but recover every dollar which the leasing company has taken from within the lines of the Indiana claim.

Yours sincerely,







File Under

E. A. Clark

Subject

Pioneer

Room 408  
55 Congress Street  
Boston

May 5th, 1909.

Mr. W. G. Swart,  
c/o Messrs. Busch Bros.,  
Rhyolite, Nevada.

My dear Swart:

Your several telegrams including the last, dated Cheyenne, Wyoming, are at hand, and I note that you reach Rhyolite tomorrow, Thursday. I am also in receipt of your letter of the 2nd inst. with reference to Milliken and his general reputation. When Mr. Holden was here last week we had brought to our attention this Milliken business, and if the stories are true, Mr. Holden and I thought it well worth while having you investigate the matter on the ground. I enclose copy of a letter which was handed to us by Mr. J. D. Kazar, which, in a general way, fully explains the situation. Milliken claims that the Pioneer people are mining his ore and have been doing so ever since they ran the 110 ft. level, that the vein outcrops on the surface of the Indiana claim, which he either owns or controls, and that it is necessary for him to sink the Indiana shaft, which he estimates will cut the big vein at a depth of 210 feet or thereabouts; that when he has done this he can prove his contention and immediately



Mr. Swart.

-2-

May 5th, 1909.

enjoin the Pioneer people from further mining operations on this ore body.

In the past we have had various Nevada gold mines brought to our attention, and we have in mind particularly the fact that at one time for a comparatively small amount of money we could have tied up the Combimation and Jumbo claims which now form the heart of the Goldfields Consolidated combination. If it is possible to fully satisfy yourself that Milliken's contentions are correct, it is then up to you to see what kind of a deal you could make, whereby we could assist him with a small amount of money and at the same time secure an <sup>long</sup> option on as much of the stock in his Company as possible. The deal which he offers is not a good one from our standpoint, but Milliken is represented as being in need of money and in a frame of mind to make a deal with responsible parties. Of course the newspaper stories on the Pioneer Mining Company's output make interesting reading, the claim being that they are producing 80 to 100 tons of ore per day that will average from \$60 to \$100 per ton. I understand that Milliken has not fully completed the payments on the Indiana claim, but that on the 6th day of this month there is another payment of six or eight thousand dollars due, and that after this has been paid he will own the property. I also understand



Mr. Swart.

-3-

May 5th, 1909.

that the original owners of the claim have quite a large stock holding in Milliken's company. If we did anything with this business it would be advisable to secure an option on their stock as well as Milliken's.

With the enclosed letter, you can see what it is Milliken offers, and what his statements are relative to the value of his property. If you can substantiate these statements, and, at the same time, convince yourself that the Pioneer people have really got as big and as rich a vein as they claim to have, then the thing for you to do is to get busy and see what is the very best trade you can make with Milliken - a trade whereby as small an amount of cash is put up and as big an option secured as possible.

Do not hesitate to use the wires freely, and believe me

Yours very truly,

*Wm. H. Calk*



TRAMP  
ECLIPSE  
HOBBS  
DENVER

CLAIMS

RHYOLITE  
NYE Co

NEVADA

May 8, 1909

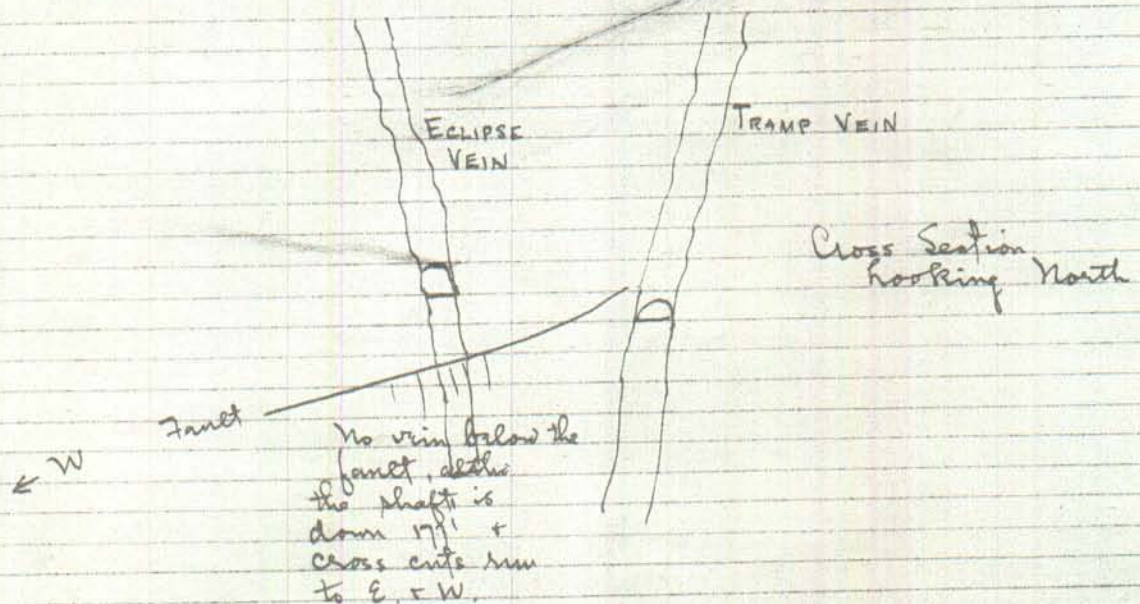
Philadelphia Co. Sherwood Aldrich, Colo. Springs, Managing Director.  
Chas. H. Garden, Rhyolite, Manager.

Group of claims on Bonanza Mountain, west of town of Rhyolite

I saw 4 veins, all striking approximately N.S. yet not exactly parallel. The Eastern vein is the Tramp. This pitches to the west, is a fault line in the rhyolite & has basalt in a narrow dike on the foot wall. The vein runs from 16 to 30' wide, but is low grade except in patches - too low to mill. Mr. Garden told me the values were very irregular but not good enough in the aggregate to mill. This holds true of all these veins.

On the surface of all the veins are good bunches of \$100 to \$500 ore. These apparently do not persist with depth for at 300' level the ore carries \$35 to \$50 and at 600' level it is much lower, and less of it. This is practically the same condition that exists at the Montgomery Shoshone.

The next vein west is the Eclipse. This dips to the East but in a wing underneath the main tunnel level the vein is cut off by a fault pitching to the west about 30°.



The Tiger vein is a small seam to the west of the Eclipse & dips west.

The Denver vein is further North than these and strikes more to the NE. It dips to the west also.



Leasers working in the Duvon are taking out 12" to 18" of  
\$1.00 ore for shipment. The gold occurs in small specks  
in the manganese + iron spots. No sulfides in upper  
levels. The lower levels show little good ore.

There is some 12,000' to 13,000' of work on this group,  
practically all on the veins, ~~not~~ and consequently a lot  
of ground blocked out on 2, 3 + 4 sides. Yet there is  
really very little ore in sight. The leasers make wages on  
a little better, but there is nothing in sight to warrant  
putting up a mill, or in expecting large mill ore bodies.  
Still, such a body occurs on the Montgomery-Shoshone  
may exist here. If it does I should expect it above the  
300' level, and near the basalt. A small stamp mill  
might be made to pay if near the dumps, which could be  
milled at least in part, and situated so that custom work  
could be done for leasers.

On the whole the property must have proven very disappointing  
to its owners, and expensives too with just enough promise  
of values to lead them to continue pushing the work.  
See no hope for the property unless a large body of ore can  
be put out and milling near the surface. A cross cut to the  
west, under the Janet in the Eclipse, might catch that vein  
+ bring in good ore, but I do not believe the body would  
be extensive.



File Under

E. A. Clark

Subject

Pioneer

Shyolite, Nevada, May 8th, 1909.

Dear Mr. Clark:-

I got in here night before last. Yesterday I was unable to get a pass to get into the Pioneer workings. They are excluding everybody, knowing the suits are to be brought. Yesterday afternoon the town of Pioneer burned to the ground, including almost all the business portion, and part of the residences. (Of course it was impossible to do anything there, as the mines were shut down, every man being engaged in trying to save the town or his personal effects. This morning was not much better, but late this afternoon I have succeeded in getting a pass, and to-morrow shall get underground and see the famous strike. I have had to perjure my immortal soul to fix this thing up, and I may never be able to square myself with my friends here if trouble results, but I came out here to get the information, and I shall get it.

When I found out yesterday that I could not do anything, I ran across E. B. Kirby, Mining Engineer, of St. Louis, formerly manager of one of the big British Columbia properties. He had just been through the Pioneer, but is evidently retained by the owners, and I could get nothing out of him. Another engineer they have retained is Chas. J. Moore, formerly of Leadville and Cripple Creek. I know him well, will try to see him and get some idea of his opinion. This whole thing is a lawsuit, pure and simple, and the whole district is stirred up over it. Kirby and I got a permit to go through the mine and mill of the Montgomery-S

hosh



E. I. C. ---2

the big Schwab property here, and we spent half a day at it. Practically all the mine is above the 300 foot level. The levels from 300 down to 700 show an enormous expenditure in drifts, cross cuts, &c, in a vain search for ore. It does not go down, apparently. Above the 300 foot level, however, there is a very large body of milling ore, which is now going to the mill at the rate of about 200 tons daily. This ore runs clear to the surface, and forms a big "glory hole", on the sides of which they are working extensively. The equipment is fine all the way through. The mining costs in April were \$2.22 per ton, including all fixed charges. The mill is a combination affair, concentration and cyanide, and the costs for April were \$2.10 per ton, making the total cost for April \$4.32 per ton. The ore goes from \$9.00 to \$10.00 per ton, and the extraction is above 90%. They are rapidly paying off their debt. I know of no possible way of estimating the ore in sight above the 300 foot level. It is spotted and irregular, both in value and occurrence. The workings are also irregular, and I could get no real idea of the tonnage.

This morning I went through the properties of the Tramp Company. These are the Tramp, Eclipse, Hobo, Tiger and Denver Mines. They are owned by a Philadelphia Company, with Sherwood Aldrich of Colorado Springs as Managing Director. They have between 12,000 and 13,000 feet of work, largely through tunnels on the several parallel veins, but there is no ore worth considering. On the surface there were fair pockets and bunches of ore carrying up to 1000 per ton or more. At distances from 200 to 300 feet below the surfaces a few leasers are taking out small bunches of ore running from \$30.00 to \$50.00 per ton. At the 500 and 600 foot levels there is



E.A.C.---3

practically nothing. It looks as though the ore in this rhyolite country does not go down, and they will have to depend on finding large bodies of milling ore within three hundred feet of the surface. So far only the Montgomery-Shoshone has done this. The Tramp geology is almost exactly like that at the M-S, and so is that of the entire district so far as I have yet seen it. They tell me that at Pioneer there are sedimentaries which may alter the complexion of things up there immensely. I can tell more about that to-morrow.

I am enclosing a clipping from the Denver News of May 5th, in which it is stated that D.E.C. Brown, of Denver has bought the Pioneer. Locally this statement is doubted, it being thought he is more likely interested in one of the adjoining claims. He is a wealthy mine operator, formerly of Aspen, Colorado.

I am also enclosing a clipping from the Los Angeles Examiner of May 6th, telling of the incorporation of the Tecopa railroad by H.E. Graves and friends.

I am further enclosing a letter just received from Lantry, which is self-explanatory. He is evidently getting very anxious, nor do I blame him, tied up as he is with debts and obligations.

I am looking for your promised letter to-morrow or Monday, when I shall know a little better what to do. So far I have said nothing to Milliken's brother, nor anyone else interested on that side, preferring first to get underground if possible.

Yours Very Truly,

Wag



Pioneer Nev. May 9 '09

Busch, Garrison, Stuckey  
arrived. I went up in  
the machine at 9:30 a.m.

Met L.P. Bryan of the  
Lansing Co. & John Buchanan  
a broker. Then Geo.

Vaughan Secy. ~~John~~

Sam H. Bradbury & Co.

Wanderer, Ill. Mine

Supr. Wm. Wader took  
no time the mine (Pioneer)

The apex of the vein  
shows just east of the  
shaft, pitching sharply  
to the west, at an angle  
The vein is very plainly  
marked on the surface  
here & just below



~~See - Shen Co  
Said from America  
Hear - Harkness  
Nothing - it  
Powers Variable - Hark Transmission  
Paisdel Co. Los Angeles  
Will know.  
Dr. Tachon.~~

~~to  
the~~



(down the hill) also  
● where the orig. tunnel  
cuts in

Went first to the 210  
level. Here there is a  
cross cut 142' to the W  
of the vertical shaft. There  
is perhaps 20' of stopping  
on the vein above this  
level, & some more going  
in. At the N end there

● is a fault or slip  
pitching to the S about  
45° or less which cuts the  
vein off entirely. The  
strike here is perhaps  
70' long & 20' wide  
showing ore on both  
sides. At the S end

there is also ore. There  
● is another slip or fault  
near the ladder way



bearing E + W +  
nearly vertical, but  
the ore appears again  
back of it. These  
slips or faults appear  
to me like minor faults  
or slips, made across  
the vein after the ore  
has formed.

There is still ore  
all along the cross cut  
back nearly to the  
shaft. Grade low  
but two samples I  
took formed fairly  
well.

Next we went up to



the 110' level. Here the  
Cross cut is about 70'  
long. Pitch of the vein  
about  $50^{\circ}$  to the W.  
Pit in seems fairly uniform.  
Samples from this cross  
cut ran clear to the  
shaft. Here the ore-  
body is about 100'  
long & 45' wide, so  
far as known. The  
strike of the vein is  
about  $20^{\circ}$  E of N. No  
as shown by my  
compass on all the  
levels. Made says  
 $16^{\circ}$  E of N is correct.  
Next we went down  
a ladder at the same



50° pitch to the west  
to what then over the  
156' level, an  
intermediate level.

Here the ore is also  
about 100' long &  
40 to 50' wide. In  
+ near the foot wall  
it is high grade.

\$50 to \$150. In  
the center it runs down  
some, say to \$30,  
with some \$10 + \$12  
mill dirt on the hanging.  
This mill dirt I also  
sampled & panned.  
with good results.  
The high values lie in



the clay or gongle.  
The whole ore body is  
a rhodalite breccia  
with thin clay + kaolin  
binder. Silicification or  
alteration is not so  
much in evidence as  
at the Montserrat -  
Durostone, but the ore  
is extensive & shows  
far better in the game.



Pioneer Nev May 9, 1909  
10:30 P.M.

I have just had a long talk  
with Ken Vaughan Secy. of the  
Pioneer Mining Co. He used to be  
telegraph operator for the I.C.C.  
By at Victor about the time I  
left there.

He says the Tobins organized the  
Pioneer M. Co. & sold stock. They  
bought the Conservative claim  
personally & Vaughan says that  
they used Co funds. ~~The then~~  
The Tobins then claimed that  
the Conservative has the Atlas &  
This so that the royalties

would come to ~~the~~ them instead  
of going to the Co. The Pioneer  
Mining Co. had a lease on the  
Bimetallic, a patented claim.  
Vaughan says D.R.C. Brown  
has bought the Conservative  
& has granted them a lease on  
the S.E. corner 300 x 600. This  
puts the leasing Co. on solid  
basis so far as conflict between  
Conservative & Pioneer claims  
is concerned. Brown has  
also bought the Pioneer, so



Vancouver claims + a  
consolidation deal is on  
between the Conservatives +  
Pioneer interests which may even  
include the Leasing Co.

The Leasing Co. holds an  
option on 100,000 shares of  
Pioneer M. Co. stock which  
they intend to exercise.  
The newspapers own 150,000  
shares of Pioneer.

Vancouver looks at the  
Indian Claims to Alaska or  
anything else. Says they have  
admitted they have nothing.



Pinnac New Mine 9 1908

Max Cowen.

Took letter of introduction to  
the manager Mr. A. Sudner. Address  
from J. H. Stacey. Went on road and  
went to Mine Super Harst & Will Supt  
with Eng. Some hands went with the  
team the mill. Put us into ground.

MILL 1 7x10 Breaker Crusher  
1 Chaffing Feeder  
5 Stamp  
P. 25  
Sitting Pond  
Granite Tanks

Hand \$20 to \$30  
" to Cyanide \$9 to \$12  
Tailings \$1.00 to \$2.00  
Extraction 85 to 90%  
Mostly gold.

MINE Went first to 200' level.  
Dip pitch 70° to 80° N.  
Strikes NW, SE not far  
from EW. Averages 6 to 10' and  
more in contact between  
these units.

Went to 300 level. Same



Conditions except the  
shaft left the vein  
at this level then cross  
cut into foot to get it  
again.

400 level shows  
nothing. 500 level is  
full of water.

Washed went along  
the outcrop, this vein  
for at least 1500 to  
2000 ft. Went in  
1 tunnel showing same  
vein. Same dip, width  
Jungbuhl sampled it.



Pioneer, New Mex., 10. 1909

Visited the Rogers & Bell  
lease just above town, also  
found Mr. Goldworthy, formerly  
of Headville & Cripple Creek in  
charge. Sinking vertical shaft  
now down 120 feet. Outcrop  
pans some. Hope to reach a  
crossing shortly. Are  
nearly N. of the Pioneer about  
 $\frac{1}{2}$  mile. Values occur in the  
gouge or clay as in the  
Pioneer.

37

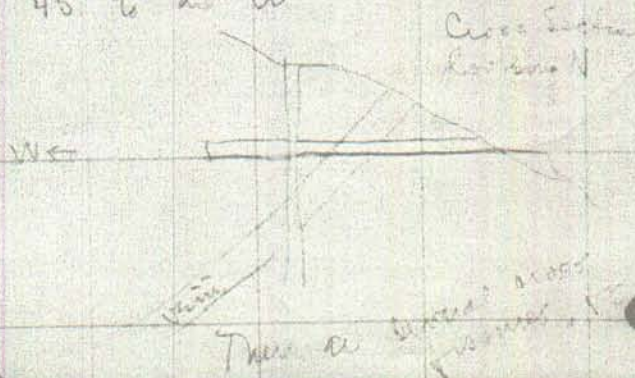


May 10 1909

Visited the Sierra Oro  
Claim, & the Jim Dandy  
lease (in which Geo. Vanhook is  
interested). S.O. is owned by  
Wm. Tobin. These claims  
lie E. & N. from the Richard  
lease & almost due the  
West of the Bell & Rogers.  
Apparently or parallel N.E.  
trends.

Went down the Jim Dandy  
shaft & out the tunnel.

Both tunnel & shaft cut a  
hard redish colored vein  
of chrysolite so there dipping  
45° to the W.





The ground near the  
shaft runs 2 to 35 in  
places. The big vein does  
not run even in the face  
along but gives small veins  
so young. Vanatol told me

The ~~Engineer's~~ ~~line~~  
Railroad line lies about  
200 to 400 to N of the above  
or similar showing. There  
seems also to be a little  
basalt close to this shaft  
vertical shaft about 140' deep



May 10, 1909

Went from the Railroad house  
to Tex Rickard's house on the  
S.W. corner of the Concentration  
claim. For a while a Native  
American, Garbony, was  
there. So went on down to  
the Engineer's house where  
I met Mr. Tammann & Mr.  
McNeeley. The latter took  
me out to show me the lines  
of the Bonmetallie &  
Indiano claims. He  
knew me where they  
were had previously indicated  
that the vein passed out  
of the side lines, by means  
of two monuments left from  
his survey. I put little  
confidence in this.

Next I went down  
town & met Fred C. &



Bob Willison who agreed to see me on the property after luncheon. Went up there ~~at~~ at 2 P.M. after first meeting Tex Richardson & Barbara & looking at their property. They have a vertical shaft 175' deep with a drift 100' low to the south near the bottom. The formation just due to the W. into the Dike. They claim to have a lot of \$10 to \$15 mill det. exposed in the drift. We took samples there & in the tunnel just below the dump all of which panned. Here I met Mr. Horsine of Goldfield. The



formation here seems  
more broken up & less  
regular than any place I  
have so far seen. ~~There~~  
I mean there is less  
indication that they are  
on a well defined vein  
or are short. There is  
a good deal of cross  
fracturing, or but no  
gange of clay walls &  
the rock seems like hard  
~~rock~~ shulite pure.

Simple, except that there is  
barren occasionally.

Richard told me a  
Pioneer miner had  
gone in the last week  
him last night to



● Show him that the  
Pioneer Ore body was  
bearing to the NW  
over toward his  
ground. Rickard  
Bordenette thinks the  
Pioneer ore is not in  
a NS vein ~~top~~ but in  
a cross vein on which  
● he is located. He  
claims to have several  
veins all coming in  
together. U. G. comes.

Next I went again  
to the Engineers house on the  
Indiana where Millikan.

Mr. Verney & Tammann  
& myself went again  
● over the situation, map



in hand. Not only is  
it a question of apex  
but of moving claims &  
which must be proven.

Milliken told me Judge  
S. L. Carpenter of Goldfield  
has the aff. writs &  
all other evidence worked  
up so I decided to go  
there & see him tomorrow.

I have indicated on  
the map the place where  
I think the apex & the  
vein lies. There is

however more or less  
an assumption as there  
is absolutely no work  
done on the ground to  
locate the apex where  
it leaves the Bimetallic  
claim. It looks as



the both parties were  
afraid to do this work  
on the surface. Milliken  
from the London & party  
will be on the Pioneer  
people as soon as the  
cut is made with this  
shaft he is to apply for  
an injunction & accounting

Royalties then to  
camp generally are  
450 are 15%  
100 20  
150 25

On the Indiana the  
Royalties are 20 22½ &

25% respectively.

All the ground is leased  
except that in conflict



D. R. C. Brown is  
due tomorrow night  
with Gov. Thomas.  
Brown has agreed to  
protect the leaders. I  
understand the Indians  
people have done  
like wise. (Investigate)

Mr. Wingfield told me on the  
train going to Mine. May 13, 1907  
that they would not wait for  
Milliken to bring suit, but  
would begin thing themselves  
at once. I claimed they had  
him dead to rights.



James Murray

Box 88

Goldfield, Nev.

Judge ~~W. B.~~

S. H. Carpenter  
Goldfield

Affidavit from Phillips  
up to date of Conservative  
Location - Jan. to Apr. 23

Utah, Nevada, May 14, 1900

In looking over the books and notes  
I requested to note the fact that  
I went down in the Millikan mine and  
about into Tammara. It was about 100  
feet deep in hard rock. Two men  
were working. The ground dips to the  
west just as in the Phoenix but



Mr. B. Curtis  
Tonalpal Nevada

Max. Magnesian

7 1/2 Bushels

Geo. Pearce

Geo. Winsted

Harry Grant

in "Winsted"

Thomas O.

Le. G. G. G.

Geo. Thomas

Dr. R. C. Brown

Geo. Winsted

Winsted

Winsted



MAYFLOWER

PIONEER  
NYE Co.

NYE Co.

## NEVADA

May 9, 1909.

Took letter of introduction from F. H. Sticksney to A. Sydney Addison, Mgr.  
Max Zimmerman went with me, but not underground.  
Supt. of Mine, Mr. Haral, took me underground.  
Miles Sigs. W. H. King took us thru mine.

MINE - vein strikes about NW-SE. Dip 70° to SW.  
width 6 to 10'. all rhyolite. Seems to be fault plane. Gouge  
nearby rhyolite constitutes the vein.

Went first to 200' level. Next to 300' level. Next to 400'. All much alike. 500' level under water. Very little ore on 400' level + none on 500'. Ore short on 300' + 300' levels about 200' long, of which I pay to mine only 120'. Values \$20 to \$30 as mined.

MILL 5 stamps, amalgamating plates, settling pond, cyanide tanks.  
(Bunker 7 x 10 crusher & challenge feeder ahead of stamps.) Ore is  
trammed on tracks from mine to high ore bin above crusher.

Monkey gold values. Extraction 85 to 90%.  
Heads to mill \$20 to \$25. to cyanide \$9 to \$12. Tails \$1.00 to \$2.00.  
Nice little plant.  
Very little available ore in sight.  
Mr. Egan is large stockholder. There is a big fight on now.

Later - at a stockholders meeting Eisen was put in control. Addison resigned.

## ROGERS & BELL LEASE

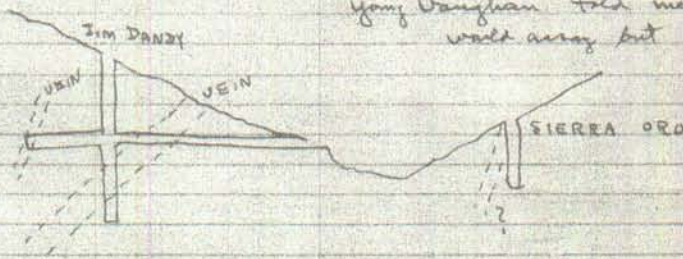
+ BELL LEASE Visited May 10, 09. In charge of Mr. Fields worthy  
 of Cripple Creek. Vertical shaft now down 120'. But crop pans some  
 Hope to catch a crossing shortly. Are nearly North of P. mine lease  
 about  $\frac{1}{2}$  mile. Values in gouge or clay. No definite vein yet cut.

SIERRA ORD  
JIM DANDY

JIM DANDY

Visited Sierra Oro May 10. Found no ore there.  
Panned some stuff with negative result. Sinkery  
a vertical shaft with a whip.

The Jim Dandy is owned by Tobin Bass. Gen. Vaughan is interested in the lease. His son showed me workings on surface - dropped me down the shaft from where I walked out the tunnel. It cuts a wide vein (30') but it pays nothing. These leases lie W. of Rogers & Bell & E. of N. of the Tex Rickard lease. Young Vaughan told me the Big vein





" RAILROAD LEASE "

PIONEER

NEVADA

Lies about 300' to 400' S of Jim Dandy on similar showing. There seems to be a little basalt near the shaft, altho' I judged only by the color. No work showing it. Vertical shaft about 140' deep - sinking. Nothing yet developed.

TEX RICKARD LEASE

On SW corner of Conservative claim 300' x 750'. Belongs to Rickard & Garbidge. Met both of them & went thro' the property. Vertical shaft 175' deep. Drift to S 100'. Formation dips W. into the hill. Claim to have a lot of \$10 stuff in drift, all rhyolite. Pass some. Tunnel also, just below shaft dump, 50' long. Stuff here panned well. Formation broken & less regular than elsewhere. No real vein apparent. No gorge or clay walls. A good deal of fracturing. Rickard thinks Pioneer lease is on a NS - EW crossing & he is on EW vein.

INDIANA

Went down the Milliken shaft. Vertical, about 100' deep. Formation dips to W. as usual. Shows no ore. Took some samples with Mr. Tammann but they did not pan. This shaft is on disputed ground. Covered by both Indiana No. 3 & Conservative claims. Milliken is sinking directly over ore body worked by Pioneer lease, to demonstrate its position after which a fight will be made. Geo. Wingfield told me they would start things first. I judge they will try to eject Milliken from the disputed ground. The Conservative is entitled to the ground according to the record. Milliken claims illegal location, etc. Mr. Tammann in charge.

ENGINEERS LEASE

On Indiana ground. Now starting a vertical shaft. 10' deep. Nothing showing. Manager by Mr. McHenry.

B. L. SMITH LEASE

About a mile S of Pioneer, on the supposed crossing of Pioneer NS system - Mayflower. EW vein. Vertical shaft 100' deep. Nothing showing. Think they are in the wrong place.



PIONEER  
CONSERVATIVE  
BIMETALLIC  
INDIANA

PIONEER  
NYC Co.

NEVADA

May 9, 1909 May 10, 1909

P. A. Busch, F. W. Stierney of 1st Nat. Bk. Rhyolite, his teller Mr. Jernigan, Max Jungbrenner and I went down in Pioneer lease with W. W. Mader, Supt. Met. of R. Bryan & Geo. Vaughan also. Shaft & workings as shown on sketches. Full report made to E. A. Clark May 16, 1909, which see for details.

Straight rhyolite formation. No porphyry, - dacite, andeinite, or nor basalt. A few boulders of quartzite (?) South of the property nearly a mile. Gold is fine & free. Pan tests show close approximation to ore values. Much fracturing & shattering & movement. Gold seems to lie in the clay in the seams. Pioneer shaft is the only one in ore. Others are prospects. I saw the Rogers & Bell lease, run by Goldworthy, Sierra Ore & Jim Dandy, (Geo. Vaughan) Railroad lease, Rickard & Garbry lease, Engineer's lease, Indiana, Mayflower, B. F. Smith lease, - in fact every hole in camp.

Royalties average on \$50 ore = 15% on Indiana 20%  
" " " 100 " = 20 " 22 1/2"  
" " " 150 " = 25 " 25 "

Practically all ground is leased.

Pioneer vein dips about 55° to W. Strike is 20° E of North.

Apex exposed just E. of Pioneer shaft shows 25 to 30 ft. wide, colored red & easily distinguished from surrounding country rock.

Tobin Bros. & Denver owned property. Leased for 18 Mos. to Pioneer Leasing Co. They ran two shaft & tunnels in to vein & got mill ore which they attempted to cyanide in a small way on the ground, hauling water in tank wagons 3 miles. This did not pay. They put a vertical shaft down 110 feet, crossing the vein. On drifting over to it they found mill ore only. They then put down a wing 46 ft. & broke into \$60 to \$100 ore, 40' wide. This they have since been shipping. They drilled the shaft to 210' & again cross cut finding same width & approximate values. They have developed an ore shoot about 100' long & 40' wide in both places. A slip or fault cuts it off on the North end & 210' level & has another one partially on the South end, altho they have some ore behind this latter slip. I estimated for Clark an ore body 100 x 40 x 60, giving 20,000 tons @ \$40 net = \$800,000. Probably \$2,000,000 ultimately. Don't believe ore goes below 300' or 400' level based on Montgomery Shoshone, Mayflower, Transp. & other history in Rhyolite.

Ore above 110 ft. level is said to be low grade. (\$10) The cross cuts are hard to be low grade ore. My samples showed \$3 in the pan.

There is an apex fight on, and a fight over locations.

Bimetallic is Senior location. Patented. Not advised by Indiana or others. Owned by Co. Controlled by Tobins. Lease is on this property. Horsey claim.

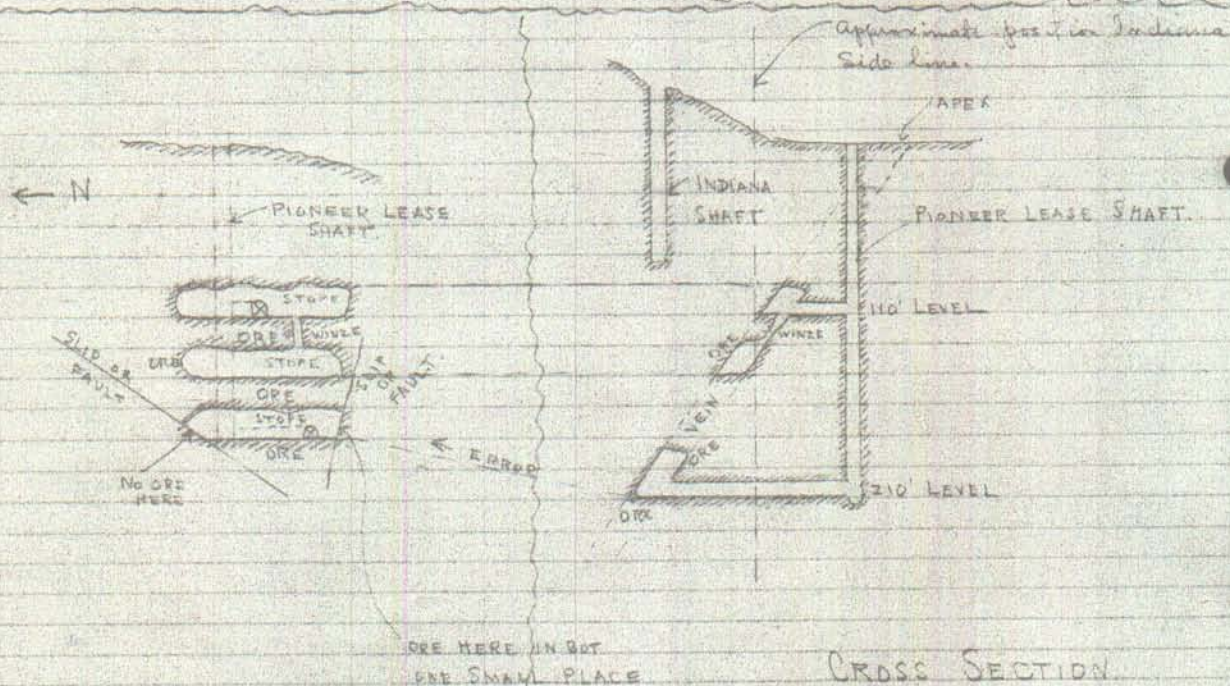
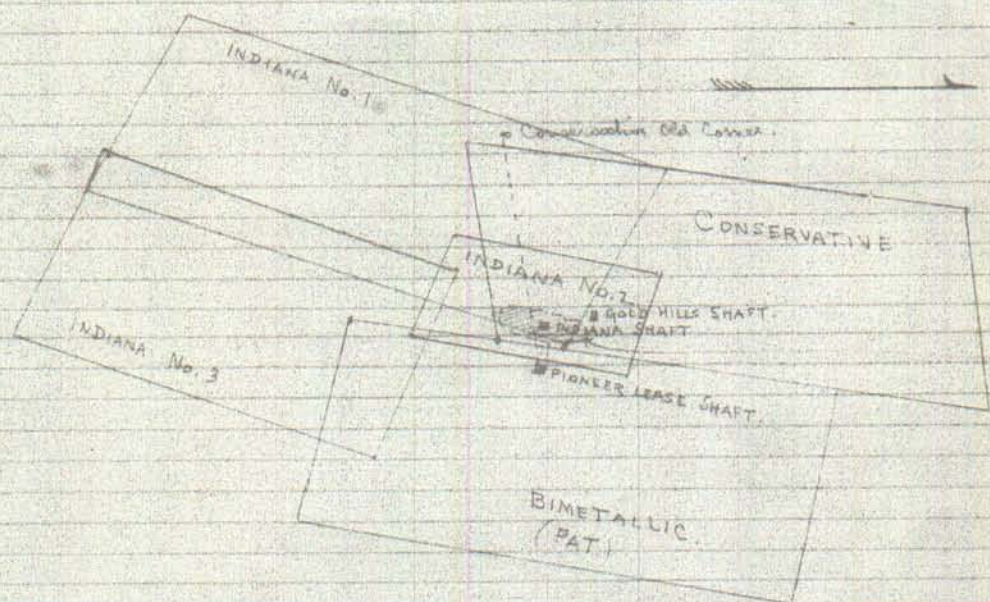
Conservative claim is next in time. Owned by Tobin Bros. Bimetallic minority stockholders suing for accounting claiming Tobins used their funds & in any event should have turned Conservative claim in to Bimetallic Co.

Indiana is junior claim. Conflict with Conservative. Milliken (W. B.) who controls Indiana, says Conservative location was antedated & monuments twice moved. Claims also there is no apex, or it is on Indiana ground. Is sinking a shaft to catch ore body which is under his ground. It is also on ground claimed by Conservative however, & they will sue to eject him. In my opinion the apex is on Bimetallic ground clearly.

Thomases are doing only necessary development work & taking out every pound of ore possible as rapidly as possible, to the detriment of the mine. The Indiana has a lot of good promising prospecting ground on the South end. All under lease to responsible people. No ore yet in sight, as there is no development.



# PIONEER MINE. SKETCH MAP OF CLAIMS



LONGITUDINAL SECTION  
LOOKING EAST OR  
TOWARD FOOT WALL

CROSS SECTION  
LOOKING NORTH



File Under

E. A. Clark

Subject

Pioneer, Nevada

377

Goldfield, Nevada, May 16th, 1906.

Mr. E. A. Clark,  
Boston, Mass.,

Dear Sir:-

As I have already informed you by telegraph, I have visited the Pioneer Lease at Pioneer, Nevada. I went into every mine in the camp, traced out the claim lines and probable apex on the ground, got all the history of the mines and locations that I could, consulted Milliken's attorney, Judge S. L. Carpenter, in Goldfield, and talked things over with Milliken's opponents, who of course did not know me as in any way an interested party.

The town of Pioneer lies about ten miles North of Rhyolite, and is in the same general geological district. This consists of a series of rhyolite flows, upturned, distorted, seamed and fractured out with no dacite nor andesite as at Goldfield. Neither does any basalt show as on the Montgomery-Shoshone at Rhyolite, although I think further development will show it existing sparingly. Porphyry intrusions may also be shown in future, but so far as the vicinity of the Pioneer mine is concerned to-day it is all rhyolite. A few isolated boulders of what they call quartzite lie on the surface a mile or so south of the mine, but I saw no outcrop or other indication of such rock being in place close by.

This rhyolite contains fine free gold, all the ore showing its approximate value readily in the pan. Surface rock taken at random will show colors, and frequently up to \$1.00 or \$2.00 per ton. The gold is more abundant along the faults and fracture planes in the rhyolite and usually runs best in the clay or gouge filling the seams. Some of the faults show considerable movement, with a gouge and breccia filling. It is these fault planes probably that constitute the veins, the rhyolite on one or both sides of the fracture being altered and mineralized.

With the exception of the Pioneer and the Mayflower, none of the mines so far have pay ore, and all are prospects pure and simple, sinking vertical shafts, now from 50 to 150 feet deep, and showing the same fractured rhyolite with a general dip into the hill to the West, the strike of the veins or faults being about North 20 East.

The Mayflower lies about one mile South and East of the Pioneer and is on East and West vein dipping to the South about 70 degrees. In other respects the formation is the same and so is the ore, except that it runs from \$10 to \$30 per ton only and must be milled. They have a five stamp mill, plates and cyanide equipment and are handling about 20 tons daily. Their shaft is



500 feet deep on the incline. The vein is from 6 to 10 feet wide and consists of gouge and breccia, with which they mine from one to four feet of the rhyolite on each side. Often the walls seem to be well marked, but behind these walls they find good ore in many places. Their ore occurs on the 300, 350 and 400 foot levels. The ore shoot is about 100 feet long, of which only about 120 feet pays to mine, the values running down rapidly in the ends. There is but little ore showing in the 400 foot level, and none in the 500 foot level, which is now under water. You will see that roughly this corresponds to the depth at which ore ceased to pay in the Montgomery-Shoshone, which is also in the rhyolite, and is one of the things which make me think the Pioneer will not go very deep with its better grade ore.

The Pioneer is also in straight rhyolite, the vein having a strike of 15 to 20 degrees East of North and dipping about 35 degrees West into the hill. This vein shows a plain, strong outcrop or apex about twenty feet East of the Pioneer Lease Shaft, on Sinnetalic ground, the vein matter being redder than the walls on either side, and about 35 to 30 feet wide at surface. This vein was originally opened up by shallow tunnels, disclosing mill dirt only. Some of this was cyanided on the ground in a small plant, water being hauled three miles in tank wagons. A vertical shaft was put down as shown in the accompanying sketches, intersecting the tunnels, and at 110 feet they drifted over to the vein, which they found still in grade. They started a winze from this level, and at a depth of 150 feet from the surface they struck ore that averaged from \$80 to \$150 clear across the vein, with picture assays in some of the streaks. The vein matter here and everywhere else is an oxidized and shattered rhyolite, with clay or gouge filling the seams and crevices. The fancy ore cannot be told from the mill dirt or waste by the eye, although the gold pan shows it quickly enough. The walls seem fairly distinct in places, but often there is good ore behind the apparent walls.

At this 150 foot level they opened up an ore shoot about 100 feet long by 30 to 40 feet wide. The ends are still in ore, but I judge from the way mining is being done it is of a lower grade. After this ore was opened up they sunk the vertical shaft to the 210 foot level, cross cut 110 feet to the #1 vein, and there again have opened up the shoot about 100 feet long and 40 feet wide, it giving values of about \$80 per ton gross as shipped. They say the high grade is next the foot wall, the values running off to \$10 to \$14 on the hanging.

At the North end of this development work the ore is cut off by a slip or fault as shown on the sketch, and in the South end there is another slip beyond which, however, on the hanging wall, they have found some ore. They do not yet know how much nor where it goes. It had only been discovered the day I visited the property. It is of course possible that this information about the ore cutting off is misleading. I got it from the Superintendent and the miners. I was naturally not allowed to take samples, but I managed to get some pieces of the material behind the slips, none of which showed values in the pan.



Now, assuming that everything is ore from the 156 to the 311 foot levels, with small allowances above and below, 100 feet long, 40 feet wide and 80 feet high, that all of it still remains in place (at least 80% has already been mined), that all of it can be recovered, and that it will not \$40 per ton after paying mining, hauling, freight, sampling and treatment, you would have about 10,000 tons in sight, valued at \$400,000. This is a very liberal estimate of the ore actually in sight. There is no possible way of estimating anything ahead of them, although I should certainly expect to find more ore and perhaps a good deal of it.

The ore is being mined by leasers on a 25% average royalty. They are naturally taking it out as rapidly and cheaply as possible, doing only what little development cannot be avoided, expecting litigation and therefore getting down their money in safe places outside the mine before the trouble starts.

The ore above the 110 foot level is said to be low grade. My grab sample panned approximately \$8 to \$10. The cross cuts from the vertical shaft to the vein are also said to be in mill ore, although my grab samples showed less than \$3.

I hardly think the ore in the bottom is entirely cut off by the slips or faults. They will get it again, and in my opinion will find that it goes down to about the 400 foot level, with the values growing smaller as the sulphides begin to show. This will mean a possible production of two to three million dollars net, and of course is worth going after. This is not in sight however, by any means, and constitutes the mining chance to be taken. Sulphides are beginning to show now in the bottom in small amount, and the values may go suddenly any minute. If I owned the mine I would be certain of more ore. Paying a big cash price for that chance however is a different matter. I certainly could not take the chance without an opportunity to carefully examine and sample the property. This I have not had and cannot get.

Taking up now the question of litigation and expense: The parties now known to be involved (there may be still others) are,

- 1—The Corporation owning the Bimetallie Claim, organized by the Tobin Brothers, and supposed to be controlled now by D.R.C. Brown and Geo. Wingfield.
- 2—The Tobin Brothers, who bought individually, or for a dummy corporation, the Conservative Claim, which has now apparently been sold to Brown and Wingfield.
- 3—The Pioneer Leasing Company, holding an 18 months lease on the Bimetallie claim, which they told me Brown and Wingfield had ratified, both as to Bimetallie and Conservative ground.
- 4—The Indiana-Nevada Company (Milliken) owning the Indian group of claims.



The minority stockholders in the Bimetallie Company have sued Tobin Brothers for possession of the Conservative claim, contending that the Tobins probably used Bimetallie Co. funds in its purchase, and in any event should have bought it for the Bimetallie Company and not for themselves individually, nor for any other Company. Brown and Wingfield will probably settle this matter out of Court, but it looks as though they would allow the question of vex to be fought out between the two claims, and as soon as possible. The establishment of the right of one of these claims to the vex, although in what is really a friendly suit, would hurt Milliken's case considerably. Some of the attorneys think he cannot intervene, but I do not feel sure of that. I am no lawyer.

Just how far the Leasing Company is going to be involved in these suits no one knows. Their lease is very loosely drawn and does not confine them within the lines of the claim as it should. Mr. Vaughan, Secretary of the Leasing Company, told me Mr. Brown had ratified their lease so far as Conservative ground is concerned, so he expected no trouble there. Mr. F.W. Stickney, President of the Leasing Company and President of the First National Bank of Rhyolite, gave me to understand that he was putting the Leasing Company's money in a good safe place, where it would be hard to follow and recover, should they become involved in a suit. I feel sure they will become involved—that is part of the game,—and that Brown and Wingfield will finally take the lease over into their consolidation.

As I understand Milliken's situation and program, he has reason to believe the big ore body is underneath his Indiana No. 1 claim, which it undoubtedly is. But it is also underneath the overlapping Conservative claim—and older location. He must therefore first prove that the ore is actually under the Indiana, which he is attempting to do by putting down a shaft as shown on the map, some 350 feet deep. He is down now about 100 feet, and it must be at least 50 or 60 days before he can cut the ore body. (I went down this shaft, which shows no ore, but with the general formation dipping to the west as in the Pioneer shaft.) In the meantime the leasers will push their output to the limit. I went down to Mine the other day on the train with George Wingfield, whom I met in just the right way through Governor Thomas and the other Denver men. He told me quietly that they had no intention of waiting for Milliken to open proceedings, but proposed to act first themselves. I judge they will bring proceedings to eject him or to stop his shaft work, claiming that he is on Conservative ground, which is true. It will then be up to Milliken to show that the Conservative location notice was antedated, and that the corners were twice moved. The first contention I do not believe he can prove. There seems to be some evidence in support of the second, although it is meagre, and is simply an unsupported affidavit by Mr. Tammany, who is interested with Milliken. Mr. Tammany displays a rather disconnected and illogical habit of mind which will make him a sorry witness when Charley Thomas gets hold of him. Milliken's brother and the attorney at Goldfield, Judge S. L. Carpenter, told me of another man named Phillips, a disinterested party, from whom they HOPED to get an affidavit as to the moving of monument.



monuments, and possibly on the antedating of the notice. I could not find Phillips nor learn anything about him.

To offset this, the Brown-Wingfield-Thomas people claim to have positive evidence as to dates and corners. You know the positive evidence a man gives that he saw and knew the monuments, and knew the dates, and made notes of them, carries a good deal more weight than the negative evidence of a man who swears he went over the ground and saw no monuments, and has no notes. The monuments may easily have been there and overlooked. At the time these locations were made there had been no good ore discovered and things were done in a very loose manner.

In addition to all this, and against Milliken's one affidavit, Governor Thomas and others have spent a lot of time on the ground collecting and sifting the evidence, and it is on this showing that Mr. Brown, a very conservative operator and one thoroughly familiar with apex suits, &c., has gone into the thing. He appears absolutely sure of his ground, as does Governor Thomas. Wingfield of course doesn't count in this. He is a plain gambler.

But suppose Milliken finally wins out his contention that the Conservative has no claim to the ore, but that it was an illegal location and the ore should go to the Indiana as against the Conservative; he has a will to fight the Bimetallic Claim, on which the apex actually lies, so far as known at present. The Bimetallic is the senior location and is the only patented claim involved. Milliken let it go to patent without protest or adverse, which was a great mistake on his part, and impossible to correct. The Conservative location comes next in point of time, and the Indiana is the junior of all.

The apex of this vein is to all appearances not to the West of the Pioneer Lease Shaft as shown on the sketch you sent me, but about 20 feet East of it, as on the sketch attached hereto, and about 100 feet inside the side line of the Bimetallic Claim. The apex of the vein is plainly exposed in the side hill at the collar of the Pioneer Lease Shaft, where excavations were made for head frame, &c., and in a tunnel about 75 feet down the hill to the South. The vertical shaft of the Pioneer Lease is timbered and closely lagged, as all shafts are here, so the vein cannot be seen where the shaft crosses it. It is of course possible that this outcrop is not that of the ore bearing vein. The evidence however is all in favor of it, with absolutely nothing yet developed against it, so far as I could ascertain. The dip is right, the tunnels show it below, and the length of the cross cuts from the shaft to the vein is about right. No other veins occur, so far as known, between this and Milliken's shaft.

Milliken's contention, as I understand it, so far as apex is concerned, is that in this rhyolite it cannot be said there is a vein. It is an especial area---a region, belt, or zone, if you like---that is mineralized, and it has no real apex. The mineral does not come to the surface---at least the good ore does not---hence if he can show ore from the surface of his claim down to connect with this ore body, there is no apex, properly



speaking, therefore no extra-lateral rights, and he must be entitled to the ore. This will be very hard to prove. In the first place all the Pioneer work is apparently on this fairly well defined vein, although it must be said the walls are not always regular nor plain. Furthermore, Milliken's vertical shaft discloses no values as yet, and it cuts a country pitching uniformly to the West so far as can be seen now. If there is an apex--and I think it will be so decided--it is on the Bimetallic claim. Now whether this vein apex runs out of the Bimetallic end or side lines cannot be told to-day by anyone. There is nothing on the surface to show it, nor does the underground work help much. The present development is not much over 100 feet long on the vein anywhere. So far as known the vein strikes about 15 to 20 degrees East of North, or in about the direction of the longitudinal axis of the Bimetallic claim, but it is close to the east side line, and may very easily pass out into Indian ground to the South. To the North it will pass into Conservative ground if it leave Bimetallic. If there are other ore shoots on this same vein, which is something absolutely unknown to-day, they may apex on the South end of the Indian ground. The vein over the present ore shoot, if an apex exists at all is on Bimetallic ground. In my opinion Milliken is beaten before the suits are started.

But there is another feature to be considered. Milliken has a lot of good ground on the South end of the Indian claims not in conflict. All this is leased to responsible people who are starting work. These leases run from 12 to 18 months, with an average royalty of 15%, with provisions that the lessees must do a given amount of development work. There is no known ore in this ground, not even the outcropping of a known vein, yet it seems certain that there must be other ore bodies than this in the Pioneer Lease, and I consider the chances for finding them on this Indian ground as exceedingly promising. If the apex trouble were not impending, with its usual great cost, I should advise you to take a chance at this ground, even though it be under lease to others, and if bonanza is likely to be garnered and robbed. I will see Milliken as soon as possible, to find out what he will do. Lest I am delayed in getting to Denver, however, perhaps you had better take it up with him direct. His address is

Wm. E. Milliken,  
1407 Josephine St., Denver, Colo.

Milliken told me he had interested Senator Chas. J. Hughes of Denver with him. This must be on a contingent fee or interest, as Milliken has no money.

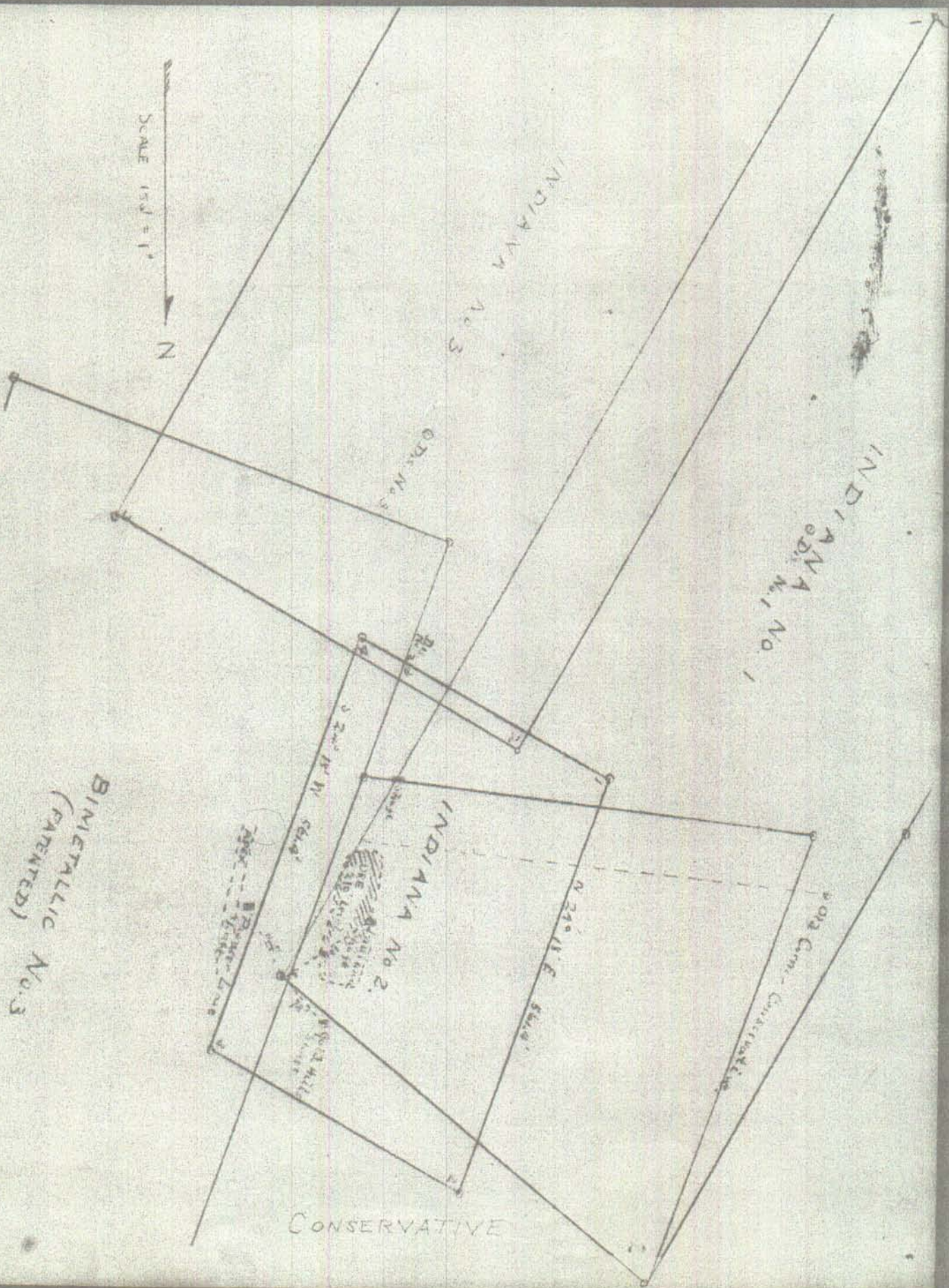
From what I have written I think you can get the situation as I see it pretty well in hand. I consider the apex suit lost, but on reasonable terms I would gamble on his free ground being ore bearing.

Very Truly Yours,

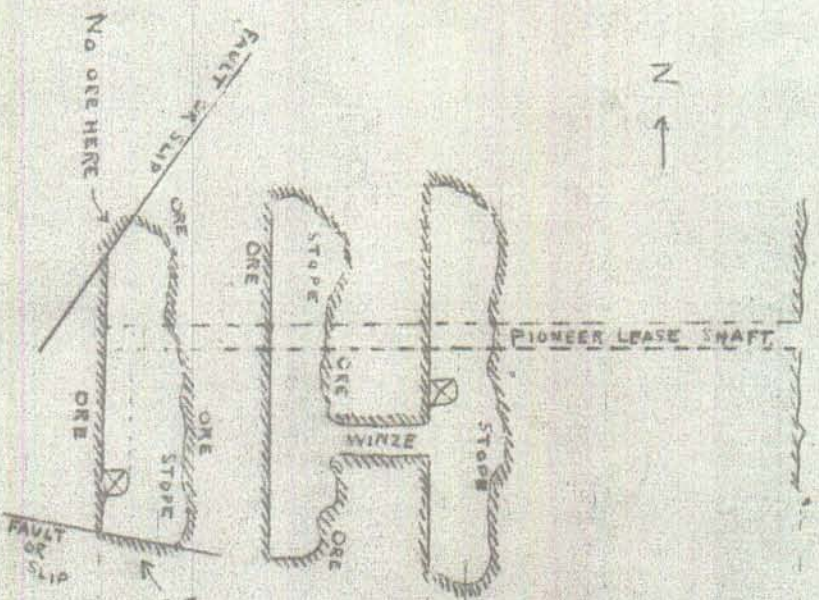
*W. G. Swart*

Copy to Mr. Holden.



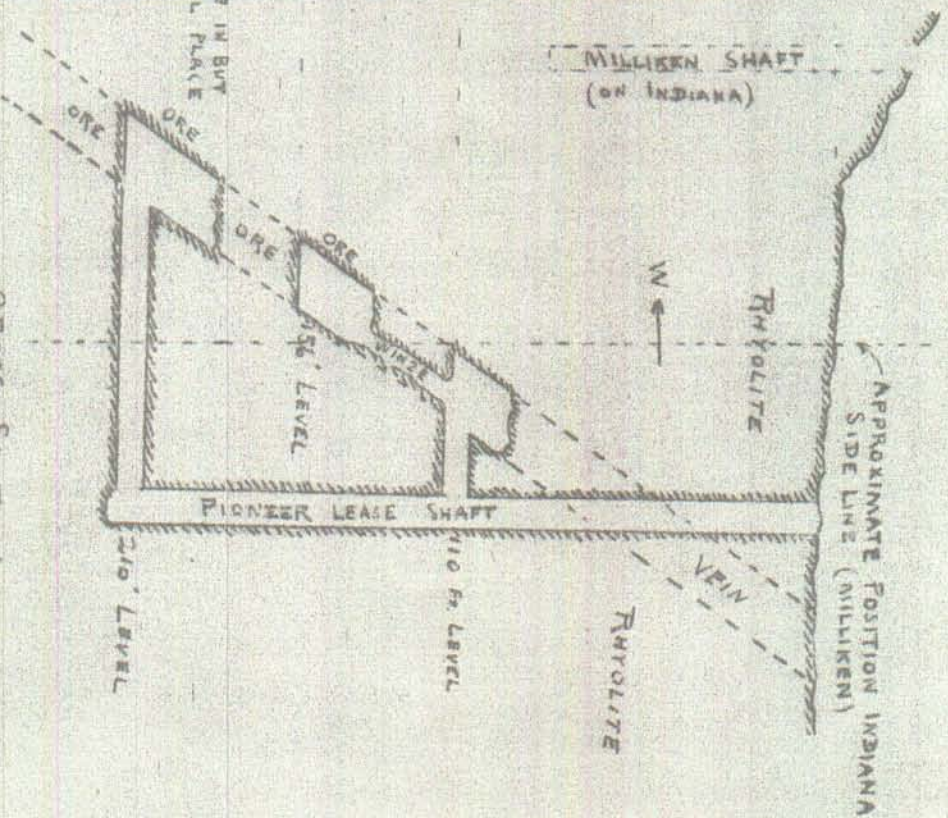






LONGITUDINAL SECTION  
Looking East or Toward Foot Wall.

NOT TO EXACT SCALE BUT  
ABOUT 50 TO 1"



CROSS SECTION  
Looking North



377

DATE March 8, 1910

INFORMATION SHEET FROM W. G. SWART, DENVER.

SHEET NO. 57

Brought in by P. A. Busch, February 15, 1910. Report by Chas. J. Moore, ME

Ore, gold and silver, occurs in fissure veins in quartz zone in rhyolite No. 2, formation, a number of these veins in close proximity forming shoots or lenses.

Present development has opened one ore shoot, 60 to 100 ft. below the surface and about 200 ft. long by 30 or 40 ft. wide. Estimates 10,000 tons in sight with possibility 13,000 all together.

Average value \$25 gross; mining and milling \$8.00; leaving net \$15.00;

net value of ore in sight \$155,000 to \$195,000. Ore easily cyanided.

Company capitalized at \$1,500,000. Offer 700,000 shares issued and 250,000 share treasury stock for \$60,000 cash.

On account of development not extensive and no mill, would not be interested.

Swart saw it last year and it did not appeal to him at all.



55 CONGRESS STREET,  
BOSTON.

COPY.

For *Mr. Swart*

BULLFROG MINING SYNDICATE  
15 Court Square  
Room 8.

Boston, Mass.,  
February 3rd, 1911.

Mr. Chamberlain,  
20 Congress St.,  
Boston, Mass.

My dear Mr. Chamberlain:

Pursuant to a conversation which I had with you am giving you in this letter a brief summary of the facts about the BULLFROG MINING SYNDICATE.

The Company is organized under the laws of Arizona with a capital of 1,500,000 shares, par value of one dollar per share. There was originally placed in the Treasury 900,000; 600,000 shares went to the owners and promoters.

The stock has been listed on the Boston Curb and has been traded in at prices from a few cents to 28 cents per share. Recently the stock has been taken off of the Curb, but the Company and the Officers of the Company have been furnishing money to develop it.

At the present time the stock is all held by a few men who are Officers of the Company with the exception of about 110,000 shares, which is in the hands of the public, having been purchased through the various Brokerage Firms in Boston, so as the Company stand to-day, there is about 800,000 shares in the Treasury and 600,000 shares owned by myself and other persons who are Officials in the Company. This stock is in escrow at the Old Colony Trust Company and cannot be released except under an agreement which the OLD COLONY TRUST COMPANY hold.

The property is owned free and clear under the Locations Laws of U. S. and application has been made for patent and there is sufficient work done on the property to patent the property. It comprises four claims located in the Pioneer District, within 1500 feet of the Post Office in the Town of Pioneer, Nevada.



COPY.

For

12.

During the last two months, several strikes have been made in that camp, but the greatest strike to be made has been our good fortune. On the centre of our ground on the claim known as the Listen Claim; there are no adverses or law suits and as we have owned the ground under those conditions for four years, there are not likely to be any and if there were, they could not be substantiated.

The Company has practically no money in the Treasury and at the present time the Officers are paying for the development work and in order to give you some idea of this camp, I wish to say there are two mills; one within 2,000 feet of our property and the other 5,000 feet, operating successfully now.

Today we received a letter from our Superintendent, Mr. Edwin S. Giles, who is a well known mining engineer in Nevada. In this letter he says he has a tunnel and trench between thirty and forty feet, all of which shows good pannings and in a great many places the vein shows free gold to the naked eye. All the mining men in the District have been to see it and it is pronounced the best showing so far that has been opened in the entire district with the amount of work done. He says he is sacking ore and by sorting he feels sure the ore will run from \$200 to \$250 per ton. Of course, those are picked samples. We are having a mill run and expect word any day as to the average values of the ore. The vein is opened 5 feet wide and he hasn't uncovered the walls, so is unable to accurately state the width of this pay ore.

Now, we are in a position where we need financial assistance in order to make this a success, if it is possible, and if you and your associates will consider joining with us, we are willing to make most any reasonable concession to you in order that this can be brought to a successful issue.



55 CONGRESS STREET,  
BOSTON.

COPY.

For .....

#3.

It is the opinion of every person that understands mining that this property can be developed into a big paying mine, as only a short distance from us on the same formation last year on a little piece of ground 400 feet square, they produced \$400,000.

If this appeals to you, and we feel that it ought to, as we have done all of the hard work and taken all of the great chances, we shall be pleased to meet you and arrange terms which I believe can be done to your entire satisfaction.

Awaiting a reply from you that you will give us an audience and consider our proposition, I am,

Very truly yours,

(Signed) CARLETON L. BREWT.

CLB/BEH.

February 3rd, 1911.



File Under CA 2  
Subject Gen

El Paso, Texas, Feby. 26th, 1911.

Mr. E.A. Clark,

San Francisco,

Dear Mr. Clark:-

I have your letter of the 16th with copy of letter from Mr. Carlton L. Brett to Mr. Chamberlain covering a property in Pioneer, Nevada. You will remember that I looked over some property for you in Pioneer two years ago. With the exception of the Pioneer Lease proper I did not see anything there that appealed to me at all. I went through all the mines that had any work done, but in none of them did the ore appear to go down. There was a fair surface showing on the Mayflower, and they were running a small cyanide mill. The bottom of the mine however showed nothing. The Pioneer Lease had a large body of good ore from 100 to 300 feet below the surface, but the bottom did not look good. They claimed the ore had been displaced by a fault, and this looked reasonable from all I could see. No one else had any real ore, nor have I heard of any being opened up since, until this letter of yours came along.

This Pioneer-BullFrog-Rhyolite country is practically a series of rhyolite flows. In Goldfield and Tonopah there is also an ~~andesite~~ andesite, which is closely associated with the ore, especially at depth. This andesite apparently does not occur at Rhyolite, BullFrog or Pioneer, where the mines have not gone down. This is shown best perhaps by Schwab's Montgomery-Shoshone, where there was a good surface body, but where I walked through thousands of feet of workings below 300 feet, run to try to get



E.A.C.---

the ore at depth, but all unsuccessful.

This Camberlain-Brett property at Pioneer might have a large surface body of ore that would pay well, but I certainly should not expect it to go much below 200 feet.

I may be up in Nevada on my way back to Denver, and if so could steal a couple of days to look this over if you think it worth while. Personally I doubt if it is worth looking at. If you want me to see it however, let me know and I will so arrange.

Yours Very Truly,

Wyo



DELOS A. CHAPPELL, PRESIDENT

E.W. BOYD, AUDITOR & ASST. SECY

A.S. COOPER, ASST. TREASURER

GENERAL OFFICE  
611-612 SYMES BUILDING  
DENVER, COLORADO

GOLDFIELD, MINOPAH, MILLERS,  
SILVER PEAK, RHYOLITE, PIONEER,  
MANHATTAN, ROUND MOUNTAIN, BONNIE CLARE.

POWER GENERATING PLANTS  
BISHOP CREEK, CALIFORNIA  
OPERATING HEADQUARTERS  
GOLDFIELD, NEVADA

GOLDFIELD, NEVADA.

4/12/11

Mr. W.G. Swank.

Amer Zinc Ore Separating Co  
Denver

Dear Sir

I am forwarding to you  
by mail today sample for  
test of a zinc, lead silver  
mine located about 75 miles  
North of Goldfield Nev.

Please advise if it is possible  
to operate same at a profit  
by means of your separation  
under the following prevailing  
conditions.

The ore deposit is 30 ft wide  
and 1000 ft long



The Nevada-California Power Company

It has been proposed to continue in depth to 230 ft and to change in character from the oxidized to the sulphide form at 130 ft in depth.

The sample forwarded is a conservative average sample of the sulphide ore it carries Ag 3.0%. Pb 3.4% Zn 9%.

The property is located 23 miles from the Sobera Ry at Mina Nera. Cost of cartage to the Ry being 6<sup>00</sup> per ton on concentrates.

There is ample water available for wet crushing.

Wood for fuel can be bought at 6<sup>00</sup> per cord.

Thanking you for an opinion

Yours Very Truly

L. B. McChesney



File Under *M*

Subject *Mine*

San Francisco, May 20th, 1911.

Mr. F. B. Mechling,

Nevada-California Power Co.,

Goldfield, Nevada,

Dear Sir:-

I delayed answering your letter of April 13th, hoping to see you recently while in Nevada. I was obliged to omit my visit to Goldfield, however, and am obliged to take the matter up by letter.

I doubt very much your being able to make pay a property carrying 3 ounces silver, 3.4% lead and 9.0% zinc under the conditions as you give them. The transportation charges would eat up all profits. The size of the ore body is attractive however, and should conditions improve with respect to hauling costs, I should be very glad indeed to take this matter up with you again.

Yours very Truly,

American Zinc Ore Separating Co.  
1118 Foster Bldg.,  
Denver, Colo.

377

*W. G. O.*



# Present Aspect of the Manhattan District, Nevada

By R. H. Toll.

Manhattan is situated in the southern part of Nye county, Nevada. Bulletin 303, U. S. Geological Survey, to which the writer is indebted for much information concerning the geological features, gives the distance as 20 miles north of Tonopah. The road leads over the hills north of Tonopah, and down past the Belmont mine, where a large cyanide plant is in course of construction. From here it follows the bottom of the Ralston desert, a broad valley lying east of the narrow string of hills called the San Antonio range, which separates it from the Great Smoky valley on the west. At Spanish Springs, a wayside watering place, at the northern end of Ralston valley, the road enters the group of low rounded hills known as the Smoky mountains, which connect the San Antonio range with the high and rugged Toiyama range to the north.

In the northern portion of this group of hills, Manhattan gulch extends down to the Big Smoky valley, and up this gulch for more than a mile stretches the ragged camp. The easy slopes of the hills on either side furnish convenient sites for the low frame buildings.

Manhattan has not produced any great mines like the big ones at Tonopah and Goldfield. There is not a property in the camp which is being operated by its owners. Lessees have, however, developed many very promising properties, and a number of these are paying well. The producing area would be quickly extended if there were adequate facilities at hand for the reduction of the ore; but at present there is but one 10-stamp mill in operation in the entire district, and the output is restricted to 40 or 50 tons per day, for it is impossible to ship any but very high-grade ore out of the camp on account of the cost of transportation. There is a large amount of low-grade ore developed which would be extracted at once if there were another mill in operation, and there are several mines which have had \$30 to \$40 ore on the dumps for a year or more awaiting treatment.

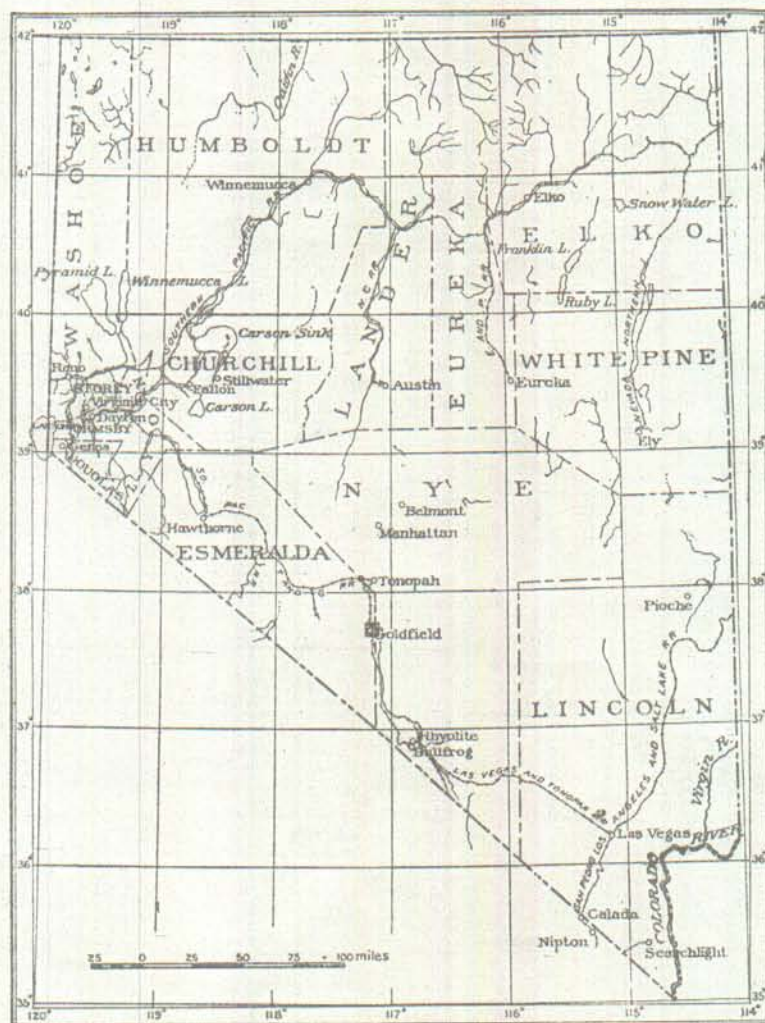
Since all the operators are merely lessees, and most of the leases are for only a year or two, it is obvious that none of the operators can afford to build mills; and the mine owners will not until their mines have been developed sufficiently to induce them to work their own properties. Consequently it is probable that the production of the camp will not be very large for some time, no matter what the developments, although if both mills were in operation the output would at once be about double what it was in August.

The War Eagle mill, at the lower end of the town, is equipped with Blake crusher, 10 1050-lb. stamps, Dorr classifier, a 5 by 16-ft. tube-mill, 6-ft. Chilean mill, settlers and Pachuca tanks. A Butters filter of 40 leaves is used, and precipitation is accomplished in the Merrill apparatus. This mill has treated about 11,500 tons during the past 12 months, the average value of the ore being nearly \$28 per ton.

The Lemon mill, directly across the gulch from the War Eagle, was built in 1910 for a custom plant, but has never been operated to any extent; chiefly because of its debts. The upper end of the mill is well constructed, but the lower end shows the lack of funds as it approached completion and some improvements are necessary. It has capacious ore bins, a well-arranged sampler, two 5-stamp batteries with separate motors, copper-plates,

has altered conditions, and in all the deeper workings the flow is rather too copious for comfort.

Manhattan gulch and some of its tributaries have produced a large amount of gold, and placer operations will be carried on for years to come. The placer production of the past year is estimated at \$300,000. The gravel is 25 to 90 ft. in depth and, while the upper portion does not carry very high values, the lower portion is rich, 2 to 4 ft. next to bed rock carrying \$5 to \$30 per yard. The placers



Map of Western Nevada Showing Location of Manhattan.

a 5 by 16-ft. tube-mill, Dorr simplex classifier, settlers, five Pachuca tanks, a stock tank equipped with mechanical stirrer, and an Oliver filter. Zinc shavings are used for precipitation.

Water for milling is pumped from the bed of Manhattan gulch, near the lower end of which both these mills are situated. In the early days of the camp water was scarce, but the development of the mines

are worked by sinking shafts to bed rock and running drifts through the rich gravel. Sinking is rapid and inexpensive, for the gravel usually stands very well without timbering, and two men can sink at the rate of 4 to 8 ft. per shift. The usual equipment for these placer operations consists of a windlass and bucket, a pump operated by electricity or gasoline, and a set of riffle sluices. Hydraulic mining is out



of the question because of the lack of sufficient fall, as well as of water under pressure. Dredging would be a very profitable method of operation if the gravel were tight enough to hold water, but it immediately sinks to bed rock.

Many large nuggets are found in the placers, often an ounce or more in weight, and most of the gold is coarse and angular, sometimes having fragments of quartz attached, showing that it had not traveled very far before being captured.

The first discovery of gold in the camp was made in April, 1905, near the southern base of April Fool hill, within 100 ft. of the Belmont-Cloverdale road, now the main street of the town. The first assays showed low values and no excitement was created, but by July of the same year "picture-rock" was being taken out of one or two of the shafts and there was a rush of prospectors to the district, who staked the country for miles around. No further very rich discoveries were made immediately, and the lure of other camps drew the shifting population away from the district and the population dwindled to a scant 100 by the end of the year. Early in 1906, however, a shipment of high-grade ore through Tonopah caused a stampede, and within 2 months there were 3000 people in the Manhattan district. Several mines were soon shipping ore in considerable quantities, though, owing to the high cost of transportation, everything assaying less than \$70 per ton was left in the mines or on the dumps, and the camp rapidly rose to a position of importance; but the local fire, the San Francisco earthquake which cut off the camp's backing, were serious setbacks, and since the San Francisco earthquake Manhattan has been a "poor man's camp," development depending on production.

The principal rocks of the district are lime and schist, with quartzite layers locally interbedded with the schist. This schist is a metamorphic rock composed principally of biotite, muscovite and quartz.

There are few occurrences of plutonic rocks within the mining area, but about 1½ miles northeast of the town an intrusive mass of granite is exposed, and about 3 miles southwest, on the road to Tonopah, is another exposure of the same rock. Rhyolite and some other eruptives occur everywhere north of the sedimentary area, hundreds of feet in thickness, forming the main rocks of the Toquima range, and small dikes and surface flows appear within the mining area, though they are not numerous.

It is evident that the eruptive rhyolite and the granite which intrudes the sedimentary strata are responsible for the metamorphism of the latter rocks; also that they caused the fractures and faults and are chiefly responsible for the filling of the same, through acting as the base of supplies for the solutions and vapors which transported the minerals forming the present ore bodies. Being evidently of deep-seated origin, it is reasonable to expect that the stronger veins will go to considerable depth, and the gold will probably be found free for some distance below the present deepest workings. Most of the faulting took place prior to the

deposition of the ore, for they seldom occur cutting off the ore or shifting the position of the veins, though there evidently was more than one period of mineralization, and some faulting occurred after the eruption of the rhyolite, as Emmons notes a fault in the rhyolite about three-quarters of a mile northeast of the camp.

Faults and fissures cut the sedimentary beds in all directions, though they usually run approximately toward the cardinal points of the compass and consequently are said to comprise two distinct systems; and the larger ore-bodies and most extensive veins occur in the east-west veins. Since many of the best bodies of ore occur at or near the junction of north-south veins, it will seem that the latter had an important bearing on the enrichment of the veins, and it is thought by some geologists that the precious metals were brought up through the cross veins and deposited in the east-west fissures, which are chiefly the result of faulting prior to the formation of the north-south fractures.

The principal ore bodies occur in the calcareous rocks, which is quite natural, since they are most easily dissolved and hence form the best channels for the circulation of the mineralizing solutions and vapors. Many of the veins, as in the White Caps, Earle, Union No. 9, Stray Dog and other mines, occur at or near the contact of the lime and schist, the ore shoots in the two first mentioned being entirely in the lime. The dip of the strata is 45° to 60° to the south.

The White Caps is quite a recent strike. The lessees worked for several months without success, but finally discovered and dug into a nearly horizontal stringer which cropped out on the side of a small gulch. This assayed about \$16 per ton and was less than a foot thick; but it expanded as developed and gradually turned down, finally proving to be but a portion of a strong vein following the dip of the formation, about 45° to the south, the hanging wall being schist and the foot wall blue lime. The vein is essentially in the lime, but the hanging is quite broken and values extend into it for several feet. The ore is quite siliceous and stained brown with iron oxide, the high-grade ore having a bluish cast, probably due to the presence of fluorite and cinnabar. Considerable realgar is present in this ore, as well as cinnabar, causing a high consumption of chemicals in its treatment. An interesting feature is that the gold seems to be associated with the mercury mineral chiefly. At the time of the writer's visit this property was opened to a depth of 85 ft., and at that depth the shoot was about 16 ft. in width and was said to average \$20 to \$30 per ton. Considerable bodies of the ore run \$100 or more.

On the Earle, adjoining the White Caps, an incline shaft has been sunk about 250 ft. in a similar formation. The vein here runs northeast and southwest and dips about 65°, being 3 to 6 ft. in width. About 1500 tons of ore is on the dumps and at the Lemon mill awaiting treatment, the value of which is said to be over \$30 per ton. A lot of 245 tons shipped over a

year ago to the War Eagle mill gave returns of \$67.

Another set of lessees on the Earle property are taking out ore of good milling grade from a 175-ft. incline shaft in the gulch about 100 yards north of the main shaft, and several other leases are in operation between this point and the town. West of the camp the Big Four, Union No. 9, Stray Dog, Crescent and others are active, the first-named being the largest producer, credited with about \$1000 a day at the time of the writer's visit, the main shaft, situated on the Steen-Poak-Cicala lease, being about 350 ft. deep.

The Big Four vein is a fissure which cuts across the bedding-planes and the schistosity of the sedimentaries. The general direction is east and west, dipping steeply to the north, but both its course and dip are very sinuous, it taking the shape of the letter S on the 220-ft. level, where a crosscut was being run from one portion of the vein to another in order to straighten and shorten the haulage way. The milling ore is 3 to 6 ft. in width, but values extend into the shale on either side and on the dumps are perhaps 2000 tons of this shale, or schist, which is said to average about \$12 per ton. The milling ore assays \$30 to \$50. This lease is said to have produced about \$250,000. The Union No. 9 and Stray Dog are under lease to the Dexter Con. Leasing Co., which is controlled by the Manhattan War Eagle Mining & Milling Co., operating the War Eagle mill. This company is blocking out ore on the 300-ft. level. The shaft is down about 515 ft. on the Stray Dog, where the principal operations are being carried on. A heavy flow of water has necessitated larger pumping equipment. The vein is 3 to 8 ft. wide. The properties have made a production of about \$750,000.

The Crescent, which is the most westerly mine in the camp, has a very good showing at a depth of 125 ft., and some specimen ore is being produced. The vein is all in the schist, similar to the Big Four, is 2 to 4 ft. in width and has produced several hundred tons of \$35 to \$40 ore. The mineral belt extends from this mine to East Manhattan, a distance of 5 to 6 miles. This territory is not all in active operation, but it seems probable that it will eventually be a very busy strip of ground, when the milling facilities shall have become adequate for handling the output of low-grade ore which has been opened in many places.

Though the first discoveries of gold were made north of Manhattan gulch, and though much rich float and specimen ore has been found on April Fool hill, all the producing area is south of Manhattan gulch, and its projection eastward. Recent discoveries on the aforesaid hill are, however, very promising, and indicate the existence of large bodies of low-grade ore which would pay to handle were milling facilities at hand.

Charcoal, like coke, is sometimes made by the by-product process, the principal by-products recovered being wood alcohol, acetic acid, acetone and wood tar.



# Geology of the Tonopah Mining District, Nevada

By Augustus Locke.\*

The important geological publications concerning the Tonopah mining district are those of Spurr and of Burgess. In these publications are presented fundamental differences of interpretation, which are the more interesting because both authorities have had ample opportunity for observation, and because both are geologists of proved ability.

The general geological features of Tonopah are shown in Fig. 1, and the differences of interpretation referred to are outlined in the accompanying notes. Briefly, Burgess regards the various rocks as flows, lying in the order of their deposition. Spurr regards them in part as flows, and in part as flat-lying intru-

already suggested, both Spurr and Burgess regard it as a flow, and both have essentially the same conception of its distribution. Above the bottom of the earlier andesite, therefore, the conception of the ore-distribution is the same, whichever interpretation be adopted.

Below the bottom of the earlier andesite, however, the matter of interpretation assumes supreme economic importance; for, while Burgess regards all the underlying rocks as older than the earlier andesite, and older than the chief ore mineralization, Spurr regards them as younger than both. Under Spurr's hy-

3. The contact between the supposedly intrusive and intruded rocks are, when unfaulted, most often notably straight and regular. Nowhere have the so-called intrusives been conclusively proved to invade by means of offshoots the rocks which they have supposedly intruded. The interpretation of irregularities of contact as proof of intrusion is made difficult by the abundant faulting, and by the possibility of interflow erosion.

4. The andesitic cover has, over a large area, rigidly confined the rocks which underlie it. The lower rhyolite, a rock having a very characteristic and unmistakable appearance, has been proved to occur on the surface only in the terri-

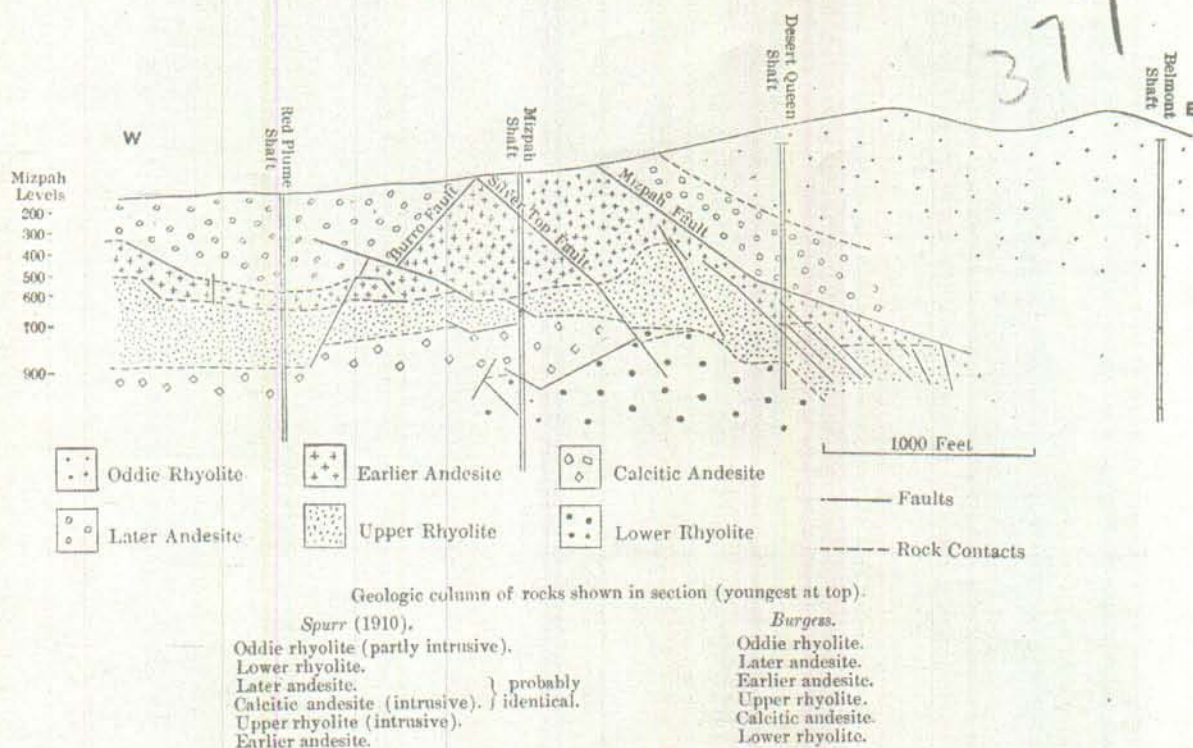


Fig. 1. East-West Section Through Mizpah Shaft.

sives. The disagreement, then, concerns the rocks regarded on the one hand as intrusives, and, on the other hand, as flows. These rocks are chiefly the so-called calcitic andesite, the upper rhyolite, and the lower rhyolite.

**Economic Importance of the Question of Interpretation.**—The economic importance of the question of interpretation is, of course, limited to its bearing on the probable distribution of undiscovered ore. The later andesite is generally conceded to be barren—a "cap rock," at whose lower contact the productive veins apex. The earlier andesite has so far yielded the bulk of the production. As has been

pothesis, exploration in these rocks is emphatically discouraged; under Burgess', it is to a certain extent encouraged.

**Outline of the Evidence.**—The important evidence appearing to favor the hypothesis that all the rocks occur in flows is as follows:

1. The locus of each rock is horizontal. For example, the lower rhyolite is encountered at depths averaging about 1000 ft., over an area of at least a square mile. Its surface, except where it is faulted, is seldom steeper than hill slopes, and is chiefly flat or horizontal.

2. Materials closely resembling stratified volcanic tuffs occur abundantly on the upper contact of the lower rhyolite, and less abundantly on the upper contact of the upper rhyolite.

tory considerably north of the producing mines, and there in very small and scattered bodies which may be inclusions.

5. The productive veins in certain places pass without diminution either in size of richness from the earlier andesite down into the upper rhyolite.

6. In many places near the top and near the bottom of the upper rhyolite, there occurs an extraordinary igneous breccia, often many feet thick and crowded with foreign inclusions; the matrix is rhyolitic, and the rock looks exceedingly like a flow breccia. The upper portion of the lower rhyolite has numerous but less abundant inclusions.

7. The rhyolites, though containing abundant inclusions, and, among them some which are andesitic, have never

\*Abstract of paper presented at the San Francisco meeting of the American Institute of Mining Engineers.



yielded inclusions which can be positively identified as belonging to the earlier or later andesites.

8. The andesites are free from inclusions of all sorts; therefore their freedom from inclusions of rhyolite is no indication that they are older than the rhyolites.

The evidence supposedly favoring the hypothesis that some of the rocks are intrusive is as follows:

1. In the rhyolites, a banding resembling flow structure sometimes follows irregularities in the contact:

2. The rhyolites occasionally have on their contacts with the andesites knob-like and wedge-like projections, looking like intrusive shapes.

3. In certain places, the calcitic andesite is separated by rhyolite from the later andesite with which it is supposed by Spurr to be identical. In certain places, the earlier andesite is separated by upper rhyolite from a rock called glassy trachyte, with which Spurr supposes it to be identical.

4. The profitable veins often disappear

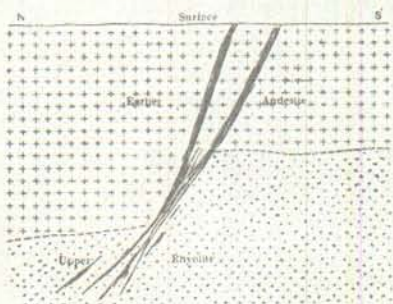


Fig. 2. Downward Extension of Typical Vein Into Rhyolite.

or weaken when they reach down to the lower contact of the earlier andesite.

*The Evidence Afforded by the General Distribution of the Rocks.*—It must be granted at the outset that the disposition of the rocks in horizons creates the presumption that they are flows. Most of the shafts penetrate similar rocks in similar succession. Thus, the lower rhyolite, so far as is known, underlies the whole district; the calcitic andesite almost everywhere covers the lower rhyolite; and above these rocks come, in order, the upper rhyolite, the earlier andesite, and the later andesite. The individual sheets of rock have many irregularities in thickness; these, however, are satisfactorily attributable to inter-flow erosion and to faulting.

Again, if we conclude that the earlier andesite is the oldest rock in the district, we must conclude also that it has been floated up by the intrusive underlying rocks to a height of at least 1000 ft., and possibly to a much greater height. (The lower contact of the lower rhyolite is not known.) During the process of floating up, the andesite has retained over an area of at least a square mile, its integrity and approximate horizontality.

A general view, then, of the large features of rock-distribution affords strong evidence in favor of the theory of extru-

sion. Nevertheless, it is conceivable that pseudo-flows might result from intrusion, and this evidence is therefore, by itself, inconclusive.

*The Evidence Afforded by the Supposed Tuffs.*—If the large facts of rock-distribution fail to furnish conclusive evidence of the origin of the rocks, this evidence must be sought in the details of the rock contacts.

In general, there are certain details of rock contacts whose testimony must be accepted as unimpeachable. One such detail is the existence at contacts of volcanic tuffs; genuine tuffs being proved to exist between layers of volcanic rocks, it is difficult to conceive of evidence, however abundant, which would prove that the layers are not flows.

It becomes, therefore, a matter of extreme importance to determine whether or not in Tonopah the supposed tuffs are genuine. Burgess, who discovered them, believes that they are. Spurr believes that they are not.

That they are tuff-like, is beyond doubt. They are somewhat soft; they possess stratification, marked by alternating bands of coarse and fine fragmental material; they cleave easily along the junctions of these bands; they lie with their structure parallel with the rock contacts.

If they are not true tuffs, resulting from surface deposition, then they are conceivably attributable to one or both of two processes—flow banding (the arrangement of inclusions along flow-lines) and movement-banding. Spurr's conception of their origin is expressed in the following: "... brecciated and granulated rock is often layered by the fault-movement and fault-pressure, so that it assumes all the appearance of certain varieties of surface-formed detrital tuffs."

Microscopic examination of thin sections of specimens from the Mizpah 700-ft. level yields conclusive evidence against the possibility of the production of the supposed tuffs either by flow-banding or movement-banding. (1) The tuffs are made up of sharp-cornered fragments, often crowded closely together, and are typically elastic. (2) They are distinctly layered; layers of coarse material alternate with layers of fine material, with no gradation from coarse to fine. (3) The abundant quartz phenocrysts, with one or two exceptions, when revolved in polarized light, extinguish with much suddenness. The wavy extinction, which is the invariable characteristic of strained quartz, is strikingly absent.

That a sorting out and sharp separation of coarse from fine should result from flow or movement-banding, is, of course, incredible. And the significance of the unstrained quartz phenocrysts cannot be questioned. Indeed, the tuffs are so life-like and their detrital origin so obvious that their import would be ordinarily accepted as a matter of fact.

*The Supposedly Intrusive Contacts.*—The supposedly intrusive contacts of rhyolite with other rocks at no place seen by me offer incontestable evidence of intrusion. Before such proof can be accomplished, it is necessary to prove

that the irregularities were not caused by faulting, or by inter-flow erosion, or by both. Now, in localities of extensive rock alteration and abundant faulting, such proof is impossible; indeed, here the proof that the irregularities were actually caused by faulting is frequently possible.

The rhyolite at certain places possesses a banding which follows to some extent irregularities of the contact, and which sometimes looks like flow banding, and might suggest intrusion. I have failed, however, to find any such place where the evidence of intrusion was unequivocal. Usually, the banding is irregular and very discontinuous. It is quite as often oblique to the contact as parallel with it. Moreover, if contact-movement, as Spurr believes, can produce tuffs, it is very easy to conclude that it can produce apparent flow structures.

*Evidence Afforded by the Localization of the Profitable Ore-Deposits.*—The usual localization of the profitable ore deposits to the earlier andesite is one of the most interesting facts of ore occurrence with which I am familiar. In certain

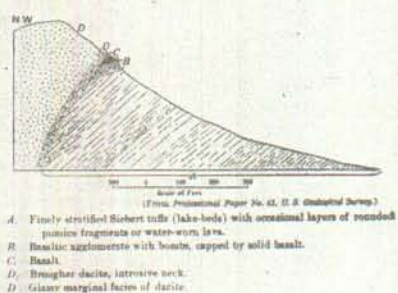


Fig. 3. Vertical Cross-Section of S. E. Side of Siebert Mountain.

cases, the ore ends abruptly when it comes down to the lower contact of the andesite. In other cases, it extends down into the underlying rhyolite, ultimately, however, weakening and dying out. Occasionally (Fig. 2) it survives for a time with a hanging wall of andesite and a foot wall of rhyolite, ceasing shortly after it passes entirely into the rhyolite. Lastly, it passes from andesite to rhyolite without change.

To explain the superior productivity of the andesite, many hypotheses are possible: (1) The andesite is the earliest rock; the chief ore mineralization followed it and preceded the other rocks. (Spurr's hypothesis.) (2) The source of the ore minerals may have been the andesite itself or the upper rhyolite. (Suggested by Burgess.) (3) The ore was deposited largely by metasomatism. The various rocks, particularly the upper rhyolite and the earlier andesite, present great contrasts in texture. Certain textural and chemical properties possessed by the andesite caused it to be more favorable to the precipitation of the ore minerals than the other rocks. Or the andesite was more favorable to the formation of initial channels than the other rocks. (4) The path of travel of transporting agents was mainly along the andesite-rhyolite contact and upward into



# Ore Deposits of the Antelope District, Nevada

Results of Examination of Recent Gold Strikes in New District East of Goldfield—About Twenty Veins Known, Occurring in Rhyolite Formation.

F. C. SCHRADER\*

file 377

The deposits of the camp of Antelope are veins containing ores of silver and gold. Their occurrence is in a general way similar to that of like deposits in the Tertiary volcanic rocks of the West. They are found in or associated with veins and fissures contained in the rhyolite. The veins are about 20 in number. They occur mostly at elevations of about 6,500 ft. The general strike of the veins is N. 12 degrees E., about parallel with the principal jointing system, but some of them depart from this direction, both to the east and especially to the west. The dip is about 40 degrees W. into the range, but varies from 30 to 60 degrees. Of the steeper dips the Chloride vein is an example. In several places the dip was observed to flatten in depth and the tendency to flatten seems to be general. The veins are fairly persistent, several having a known extent of 2,000 ft. or more, while for some a much greater length is claimed. Branching and intersection seem to be common.

The veins are exposed principally in the southern and northern parts of the district. If present through the considerable stretch of intervening ground, they are mostly covered by alluvial wash and debris from the mountains.

The veins vary from 1 to 20 ft. or more in width, 8 ft. being perhaps a fair average. As for the most part they weather evenly with the country rock, the croppings are generally not prominent. However, there are some good looking croppings, consisting chiefly of iron and manganese stained quartz and silicified rhyolite, in the southern part of the district on the Chloride and Auriferous groups, in the western part on the Antelope group, and to the north on the Reflection and Listowell claims.

The Auriferous croppings have considerable gossan that pans well in gold. Quartz samples from the Exposition shaft show hematite with specularite and some pyroclastic, and quartz ore from the Chloride shaft, near the southwest corner of the Antelope View, contains considerable chrysocolla.

The gangue is quartz and faulted, crushed and altered rhyolite. The rhyolite is in part silicified, in part completely kaolinized to a white chalklike mass of so-called talc, and in part affected by all stages of alteration between these extremes. The chalklike material is largely kaolin, with some alunite. The portions most resembling talc in the hand specimen are found under the microscope to consist principally of sericite, a filmy white or colorless mica derived by alteration from the orthoclase. Even the portion of the gangue which at first appears to be normal vein quartz is found on examination to be mainly altered and silicified rhyolite replaced by quartz. Some of it has a finely honeycombed or porous texture, which seems in part due to cavities of disseminated pyrite dissolved out of the rhyolite. The quartz is also drusy, with small, very irregular cavities containing acute angles and jagged walls studded with pyramidal quartz crystals and filmed with hyalite. Adularia is sparingly associated with the quartz as a gangue mineral.

In the northwestern part of the district, on the Antelope group, was observed some platy quartz, pseudo-

morphic after calcite or other spar, indicating that the present gangue has in part replaced an earlier gangue mineral; but this phase of replacement seems to be very subordinate.

In general much of the gangue is more or less heavily stained with iron and manganese, and as shown by slickensides and displacements there has also been considerable post vein movement.

The valuable ore minerals are chiefly the silver chloride, cerargyrite or horn silver, and the sulphide, argentite. They occur mainly in the form of dark-green or gray-green specks, bodies, and films widely distributed through the gangue and with them and the iron oxide is associated the gold. Some of the bodies are cuboidal and apparently fill casts of dissolved pyrite crystals. The film form is best developed on slickensides in the chalky kaolinized masses.

About four-fifths of the valuable content of the ore is in silver and one-fifth gold. In places occur bodies several inches in diameter of yellowish and gray-green horn silver that are very rich. Macroscopic free gold is not common, especially in the main vein, but in a cellular quartz specimen collected at about 60 ft. down the hill slope from the Antelope View mine the pocket lens shows the dark silver ore bodies to be peppered with small beads and specks of gold. The light color of much of this gold denotes that it is in alloy with native silver.

Associated with the ore in many places is considerable iron oxide, mostly limonite, which so permeates and stains large bodies several feet in diameter that the mass resembles partly decomposed iron ore. Much of the ore of this type, as well as of the porous honeycombed siliceous ore, pans well in gold.

In places the ore minerals, by metasomatic replacement, impregnate to a considerable degree the surrounding altered wall rock, which is locally kaolinized or silicified for distances of 60 ft. or more back from the vein. In contracted parts of fissures and in small fissures and joint cracks showing little or no distinct vein the ores appear along the planes of division.

## Antelope View Mine.

The Antelope View mine, where the recent strike was made, is near the south-central part of the district, about a mile south of the spring, in the east base of Jordan Ridge. At the time of visit it was opened by a 150-ft. crosscut tunnel and a 23-ft. inclined shaft sunk on the vein. The shaft was sunk mainly under a Wingfield option.

The vein strikes N. 12 degrees E. and dips 35 degrees W. into the hill. The country rock is the rhyolite which has been described. Locally the hanging wall only is known as rhyolite, the foot wall because of its numerous kaolinized feldspar phenocrysts being called "birdseye porphyry." The supposed difference is due to weathering, however, for the microscope shows the rock in the two walls to be the same.

The shaft is about 50 ft. above the edge of Mineral Wash on the east and 35 ft. above the tunnel. The vein here has a width of about 10 ft. It is opened in one of the best mineralized spots of the camp and near by seems to be joined by one or more spurs or feeders coming in

\*Extract from Bulletin No. 530; "Contributions to Economic Geology," U. S. Geol. Sur., 1912.

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## The Cabinet of Miscellaneous Information

### Air Compressor Capacity—

To find the capacity of an air compressor in cubic feet of air per minute, multiply the area of low-pressure cylinder (on compound compressor), or the area of simple compressor cylinder, in square inches by the stroke in inches; then divide by 1,728. Multiply this result, (1) in the single-acting, double or compound, by the number of revolutions per minute; (2) in the double-acting, single or compound, by twice the number of revolutions per minute; (3) in the duplex double-acting, by four times the number of revolutions per minute.

### California Quicksilver—

From 1850 to 1911, inclusive, California produced 2,104,218 flasks of quicksilver. The maximum production was reached in 1877, when the output was 79,395 flasks. The average production during the last five years has been about one-half the average for 62 years. Notwithstanding this decline, the state furnished 88.7 per cent of the total production of the United States during 1911. San Benito and Santa Clara counties are the principal producers. There were 27 producing quicksilver mines in California during 1911.

### Water Pressure—

To find the pressure in pounds per square inch of a column of water, multiply the height of the column of water in feet by the factor 0.434.

### Pennsylvania Copper—

Most of the copper produced in Pennsylvania comes from the magnetic separation of iron ores of the Cornwall mine in Lebanon county, Pa. The mine is worked by open cut and the plant includes a 1,000-ton separator in which the iron oxides are magnetically separated and the tailings are concentrated for the copper sulphides, which are briquetted by the Groendel process and sold to copper smelters.

### A Large American Diamond—

Most of the American diamonds come from Arkansas and California, although accounts have appeared in newspapers of the discovery of these gems in Illinois and Texas. The most important find of the year in Arkansas was an 8½-carat white diamond—the largest diamond so far found in the state. Another white diamond, of 3¼ carats, was also found.

### Kansas Coal—

The major part of the coal output of Kansas is used for locomotive fuel and some of the larger mines are operated by the fuel departments of the railroads or by companies affiliated with the transportation interests. None of the product of such mines is marketed commercially.

### Chilean Salt—

In Chile the deposits of common salt are almost limitless. One bed covers about 200 square miles, with an estimated depth of more than 300 ft. of rock salt, much of which is 99 per cent pure. This deposit is estimated to contain 3,000,000,000 tons and covers but a small portion of the salt deposits in the northern part of the country. Russia also has immense deposits of salt, which so far have been but little worked; and other large beds are found in Prussia, England, Ireland, South Africa, India, Austria, Spain, and Canada. In the United States salt is mined like coal in Louisiana, Michigan, Kansas, and other states. It

is also made from sea water along the coast wherever the heat from the sun is great enough to evaporate the water.

### Manganese Imports—

The importation of manganese ores continues to greatly exceed the domestic production and will probably continue to do so as long as the principal sources of foreign supply are abundantly and cheaply worked, and ocean freights are low. In 1911 the imports were 176,852 long tons, valued at \$1,186,791, a decrease of 65,496 tons as compared with importations for 1910. This decrease in the demand for manganese is attributed to the depression in the iron and steel industry.

### Moss Agates—

Much interest has lately been aroused in the moss agates found in Montana, some of which are remarkable for their resemblance to landscapes. By taking advantage of the arrangement of the dark seams and dendritic patches, patterns are obtained that resemble moss, sea growth, ferns, rushes, trees, and landscapes with water and islands. The cut gems consist of stones suitable for use in brooches, stick pins, watch fobs, belt buckles, and other ornaments. The gems cut from the Montana moss agate or mocha stone command good prices, bringing anywhere from \$1 to \$200 or \$300 apiece. Some of the smaller stone suitable for stick pins, if the mossy or fernlike patterns, are particularly delicate and beautiful, bring \$25 each.

### Gypsum Industry—

The quantity of gypsum mined in 1911 was 2,323,970 short tons, valued at \$6,462,035, as stated by E. F. Burchard of the United States Geological Survey. This was a slight decrease from the figures for 1910—1.05 per cent in production and 0.94 per cent in value—but while the industry was not especially active certain changes, such as the replacement of old mills by a smaller number of larger modern mills and the establishment of mixing plants in commercial centers, should result, according to Mr. Burchard, in the saving of freight charges on finished plasters and enable the products to be sold to the consumer at low rates. Gypsum was produced in 17 states and in Alaska from 78 mills. The imports for 1911 were considerable reduced.

### The Piedmont Region—

That part of the Carolinas which lies immediately southeast of the Blue Ridge, in what is known as the Piedmont region, has long been of both scientific and commercial importance, largely on account of the variety and abundance of its minerals. In fact, in the number of its mineral species North Carolina is said to surpass any other state in the Union, and a great variety of minerals has been found in South Carolina. Mining in this region dates back from the time of the settling of America, and early Spanish and English accounts of the discovery and recovery of metals are numerous. The principal mineral resource is gold. Iron has been mined to a considerable extent and within recent years the monazite industry has attained some importance. Besides these materials, tin, copper, lead, manganese, pyrite, mica, barite, corundum, clay, limestone, and granite are or have been found and worked to some extent.

The Transvaal gold output in 1911 constitutes another record. The total output reached \$170,286,718.

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from the Chloride group on the southeast. As exposed in the shaft it consists principally of crushed and blocky silicified and kaolinized rhyolite, partly iron stained, with quartz in irregular bodies, bands, stringers and veinlets.

Practically all the material excavated from the shaft (about 30 tons) is ore. It is reported to average about \$200 to the ton, and contains some rich bunches. At the time of visit two tons of the ore had been shipped, 14 tons were sacked ready for shipment and about an equal amount lay on the dump.

The bottom of the shaft at this time contained several angular blocks of relatively little altered rhyolite which seemed in part to displace or crowd out the vein. Later reports, however, state that at the depth of 50 ft. the vein was widening and the ore had improved in grade.

Early in April the shaft had attained a reported depth of 85 ft. At that depth the vein is about 3 ft. wide and some samples taken across its width assayed \$600.

The tunnel, which also has produced some ore, is driven on the foot wall side in crushed and partly altered rhyolite. Its dump material is more or less iron stained and much of the rock has a parallel elongated or semi-rodlike structure, the rods consisting mainly of chalk kaolinization products, apparently derived from the feldspars.

On several of the leases to the north and the south, on the Western Union claim, and on the Hilltop adjoining the Western Union on the west, where the vein is split or is represented by three veins, some shallow openings show good looking prospects that yield fair assays of ore minerals, principally horn silver, but not yet in workable amount. In fact, the lease openings, some of them 20 ft. or more deep, seem to indicate that the rich ore found in the Discovery shaft does not extend continuously along the vein, as was expected.

#### Chloride Group.

Six hundred feet south-southeast of the Antelope View mine, near the southwest corner of the Chloride claim, a vein which seems to be a spur or feeder to the Antelope View vein, is opened by a 40-ft. 60-degree inclined shaft. The dump shows the vein material to be principally crushed quartz, and it is reported to carry only low values.

On the Clifford lease, about 100 ft. to the east of the above-mentioned shaft, in the west edge of Mineral Wash, is another ledge which at the time of visit was being opened with good results, its material panning well in gold. A few hundred feet north of this locality a 3-ft. hole that was being sunk apparently on the same deposit exposed a 10-ft. vein, which, together with its iron and manganese stained croppings, ranks among the best indications seen in the camp.

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On the south, where opened by a 40-ft. 40 degrees inclined shaft, the vein has a width of about 14 feet and contains some greenish quartz which traverses the rhyolite in stringers and veinlets, locally forming a sort of stockwork.

Toward the north end of the vein the principal opening is a 150-ft. 30 degrees inclined shaft, which is in iron-stained crushed and part altered and silicified rhyolite, some of which is also brecciated and cemented with infiltrated quartz.

The eastern or Mocking Bird vein, situated about 100 ft. lower than the upper vein, is opened principally by a 120-ft. 30 degrees inclined shaft. The walls consist of rhyolite that is less crushed and more massive, coarse and blocky than that on the upper vein. They are also in part silicified. The dump contains a little ore, but so far as learned there has been no production.

#### Conclusions and Suggestions.

Although no deep sinking has yet been done in this camp, present developments and the geologic and mineralogic conditions indicate that the region probably contains a reasonable amount of fair grade ore. From the general nature of the deposits, the relatively unfavorable character of the underlying rock, and the tendency of the veins to flatten in dip as they go down and to follow the bedding of the flows, it is inferred that the deposits are practically confined to the rhyolite covering and as a rule do not penetrate the underlying quartzite. The thickness of the rhyolite probably nowhere much exceeds 500 or 600 ft. and in most places it is considerably less.

The view held by many that rhyolite is a particularly unfavorable formation for the occurrence of mineral is without good foundation. This is shown by the Jarbidge, De Lamar and other camps. Besides, the rhyolite of this district is known to be among the productive rocks of the Southwest.<sup>1</sup>

In prospecting, as pointed out by Ball, attention should be given to the quartz veins and fissures in the kaolinized and silicified areas of the rhyolite, to the contact of the rhyolite with the underlying intruded rock, especially if it is limestone, and also especially to the contact of the rhyolite with the younger intrusive andesite and dacite, as in the Antelope peak area on the northwest, and to the andesite and dacite themselves.



# Electro-Cyaniding and Precipitation in Amalgamating Pan

Inventor's Description of the Parks Process for Recovering Precious Metals in a Single Machine—Elimination of Filtering or Separate Precipitating Devices.

JOHN B. PARKS\*

Heretofore, practically all successful metallurgical processes in which cyanide salts have been used to extract gold and silver from their ores have contemplated:

1. Removal of coarse particles of the precious metals by amalgamation in a separate device before the ore is submitted to cyanide attack.

2. Presentation of the more or less finely crushed ore to chemical attack by an aqueous solution of cyanide salt, to which is added an alkali to neutralize acid radicals of the ore, to save cyanide salt; this solution must also contain oxygen, either the normal amount that water will dissolve from the atmosphere, or a superabundant amount added by aëro-agitating devices.

3. Separation in a clear state, by settling and filtering devices of the aqueous solution containing gold and silver cyanides, unused cyanide salt, and complex impurities, cyanates, sulphocyanates, etc., of the base metals.

4. Continued and perfect contact of the cyanide solution with the shavings or dust of an inexpensive base metal which precipitates part or all of the precious metals.

5. Separation of the precipitated precious metals from the remaining base metal, washing, collecting, drying and compressing the finely divided precious metals for melting and casting into bullion.

The object of the Parks electro-cyanide process is to apply economically all of the chemical and physical forces necessary to extract and collect the precious metals, applying them at their highest potency, and simultaneously. This necessitates economy in chemicals, their almost instantaneous use under their best operating conditions to every particle of ore.

The compound rotary motions of the anode rings and their paddles give to the pulp confined between them the cathode plate a very uniform spiral motion outward, keeping the ore in a perfect state of suspension, and at a little higher speed than pulp travels down a standard battery plate. By the centrifugal force of the paddles, pulp on reaching the staves of the pan is forced up between them and the outer edge of the outer anode ring to a height of about 16 in. above the anode, retaining the rotary motion imparted by the paddles and now endeavoring, against gravity, to seek the lower level at the center of the pan. The resultant motion is a downward and inward spiral until the ore passes over the inner edge of the inner anode ring near the center cone, when it again meets the paddles and starts to repeat its cycle of travel.

At the periphery of the pan, and on a level with the cathode plate, 20 jets of compressed air are admitted through needle valves set at regular intervals around the pan. The air pressure—about 12½ lbs. per square inch—is sufficient to overcome the centrifugal force of the pulp against the valve exits and to keep them clear. The amount of air is calculated from the oxygen demanded by Elsner's formula for dissolving the precious metals in cyanide salt, with an allowance for unavoidable waste in mixing. The air, on leaving the valve, travels against the outward spiral motion of the pulp between the anode and cathode plates, and nearly all the excess makes its appearance as a slight effervescence around the center of the pan, being thoroughly incorporated with the pulp; comparatively little escapes by rising to the surface without passing between the plates. At 100 lbs. pressure 1½ ft. of air per minute is an ample supply for the pan during treatment.

The writer during the past eight years has experimented with many iodine, bromine and other chemicals, seeking economy and efficiency, and has found nothing so effective and economical as commercial potassium or sodium cyanide, or the commercial double salt, together with common lime and common salt, aided by the sodium amalgam and caustic soda generated by the process.

The electrical factor of the process, which consumes from 75 to 80 per cent of all the physical power necessary to operate it, and accounts for the speed, efficiency and economy of this as compared with other processes, is worthy of considerable attention.

From a 10 to 12-volt, 400-ampere, D. C. generator the positive wire, after leaving the switch and indicator board, is led to the mechanical portion of the pan in four branches, each of which terminates in a suitable brush that plays against the copper collecting ring on the hollow shaft which drives the outer annulus of the anode. Two brushes play against a similar ring on the hollow shaft which drives the inner annulus of the anode. By this means the electric current passes up the vertical driving shafts, insulating from the cone through which they pass, and proceeds down the driving arms and supporting rods to the anode annuli, where it is uniformly distributed.

The negative wire from the electric generator, after passing through the switch and indicator board, also terminates in four branches, each of which connects with a copper tail piece projecting through the pan, each tail

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CORRECTION  
THIS DOCUMENT HAS BEEN REPHOTOGRAPHED TO  
ASSURE LEGIBILITY.



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For W. L. Swart.

(COPY).

R E P O R T

On

THE PIONEER-INDIANA GROUP,

BULLFROG DISTRICT, NEVADA.

By

FORBES RICKARD, MINING ENGINEER.



The Pioneer-Indiana Group is situated about the little town of Pioneer, seven miles north of Elyolite, in the Bullfrog District, Nevada.

The property is attracting a good deal of attention just at this time, through the rehabilitation of the Pioneer Mine, which has been practically depleted of high-grade shipping ore by the leasing company which preceded the present management under the Tobin Brothers. The latter have recently erected a mill for the treatment of the bulk ore of the mine and are bringing the property back to the productive, and profitably productive, stage. Altogether the Pioneer bonanza may be credited with upward of \$500,000. gross production.

The Indiana has gone through expensive litigation with the Pioneer interests, but that is over with and boundary lines have been adjudicated with finality. The effect of this litigation has been to deprive the Indiana of what is known as Indiana No. 2 Main Shaft. Workings now open out from what is known as the Engineer Shaft, 405 ft. deep, 8-1/2 x 4 ft. in the clear, with hoisting compartment and manway securely timbered. Main levels and crosscuts are run out at 200 ft. and 265 ft. respectively, and through these it has been the aim and effort of the Indiana operators to pick up the main Pioneer creshoot in its southwesterly extension; and failing in that, to at least prove the existence of separated parts of the main orebody. Thus far developments cannot be said to have been successful, but as I shall go on to show there is encouragement in what can be seen in the mine, particularly at and about the 265-ft. Level.



Surface equipment consists in,

One 40 H.P. Electric Hoist,  
About 500 ft. of Cable,  
Two Ore Buckets, and Ore Cars,  
One Blacksmith Shop and Equipment,  
One Blower and Motor for same.

The geology of the territory which includes the Pioneer orebody is much complicated by faulting and through the convergence of a variety of rhyolitic flows and tuffs, and possibly the inclusion of dissected parts of sedimentary chloritic schists and quartzites. In broad terms, the Pioneer orebody lies in a zone of sheeting and brecciation, in its widest places resulting in mineralization to a width of fifty to sixty feet, and having very much the form of a chimney; in fact, the plan of the orebody in successive levels looks like a series of overlapping concentric rings. Separately from this there is a zone of sheeting and fracturing in the mass of hard rhyolite which is developed by the workings before they approach the point of the main Pioneer orebody. In this zone there are a number of fractures and veinlets which are locally termed "water courses", - these affording occasional assays ranging from a few cents to a few dollars. They are in my opinion unimportant.

The deciphering of structural features is very necessary in this camp of Pioneer, in finding your way to an orebody and in following it up.

Chemical action of vein solutions is everywhere confined to the fractures and the fissures. It does not



extend into the country rock, and there is no extensive alteration of the country rock as is commonly observed in other districts. Similarly, the boundary between the vein proper and body of adjacent rhyolite in the Indiana ground is not likely to be distinct.

Veins and faults in this district are very closely associated and both occupy fissures formed at the time and the region received its structural dissection. In the Bullfrog District proper it is claimed that about 10% of the faults are associated with veins of either known or prospective value. The tremendous block faulting of the Bullfrog District is illustrated in U. S. Geological Survey Bulletin No. 407, which has been of great aid to me in assembling my information. While, in the district to which this Bulletin refers, many fault displacements are less than 100 ft., there are instances (like the Montgomery-Shoshone fault) where the displacement is over 2000 ft. vertically. Nearly everywhere in the district in general there is a horizontal displacement, or heave, accompanying the vertical displacement, but these faults are simplified in that the horizontal movement is always found to operate in one direction.

Pyrite everywhere is altered to limonite, but none of these veins were originally rich in sulphides; it is nowhere more than a slight impregnation. Quartz in greater part is formed by the silicification of fragments of rhyolite and fine-ly granulated interstitial material. Coarsely-crystalline quartz is not characteristic of any of these veins of Pioneer and often it is hard to distinguish between the valuable breccia ore of the orebody and the iron-seamed breccia that may be found in



a part of the mine away from the orebody. The rhyolitic flows, when shattered, give rise to the rhyolite breccias, and when these have been enriched by deposition of gold in the seams and interstices of the rock it constitutes ore; where no enrichment has taken place it is country rock and waste.

In all the veins which I saw in the district, manganese was present in association with calcite, and where calcite had been removed there was left a black residual product, or earthy residue. In the Yellowjacket Mine of this district there is a working which is called the "Coal Hole" on account of the black earthy dust which sifts from the vein when it is worked. Men working there come out of the mine as black as if they were working in coal.

Most of the production made by Pioneer owners and by lessees has been sorted by hand and shipped out of the district. Some of it has gone to Salt Lake City and to San Francisco smelters. The richest shipment ever made went to Salt Lake City and brought \$10,000. net for the carload. In latter times little or no rich shipping ore has been found, until, recently, about the 225-ft. Level, there has been developed a streak of very rich ore, as high-grade in fact as anything that has come from the mine in its history. The beginnings of this were shown to me when I was at this mine, but it is too early yet to gauge the importance of the new discovery.

In the accompanying plan map I appropriate the survey of Mr. W. M. Milliken, Mining Engineer, making such changes and alterations as occur to me to make. I have designated the rock changes so as to relate the one rock to the other and to permit of comparison relative



to the rock formation in the Pioneer Mine.

My conclusion is that only at the extremity of the long crosscut is there any real analogy between the formation in the two mines, and that it will be necessary to pick up the orebody very close to the common endline of the two properties before following it back into the Indiana ground. And by reason of the angle of the Conservative Claim, which juts into the Indiana claim about the southwest extremity of the main stope, it is going to be difficult to keep within the Indiana boundary in prosecuting the work about the 265-ft. Level. Reference to the map will make this clear.

The characteristics of the Pioneer oreshoots are:

1.- That they are limited on the footwall, or easterly, side by a 50 ft. thickness (more or less) of brick-red attrition clay; that is to say, a clay that has been formed under intense crushing strains connected with fault movements.

2.- As the orebody is followed down it shifts, or breaks away, into the upper or hanging wall and becomes successively richer and smaller in dimension.

3.- That in the lower parts of the oreshoot the ore makes well out into what is known as the Green-Rhyolite, which everywhere flanks the ore body on the upper side. Whether this is a true rhyolite remains to be determined. It is recognized that the green color in some of these rocks is due to abundant chlorite, and probably derived from a pre-existing large deposit of green chloritic shales of the original formation.

The ore itself, as previously noted, is a brecciated rhyolite seamed with hydrous oxides of iron and manganese. The values are entirely in gold, - silver being so small



as to be negligible.

In the lowest level of the Pioneer Mine there has been much work done northward into Tobin Mountain which apparently has been unproductive. It is safe to say that it has been unprofitable, since no workable orebodies have been developed through the many tunnels fingering into the hill. In my opinion some of these tunnels underlap the long crosscut of the Indiana.

Further, since these same attrition clays, the greenish schistose rock, the rhyolite breccia, and the so-called green rhyolite, can all of them be identified in the formation which I endeavor to show mapped in plan, it is reasonable to conclude that they should somewhere in the Indiana ground be similarly productive. The explanation for the circumstance that nothing more has been developed than is the case, is found in the condition of interruption of the Pioneer orebody in a flat vein system which does not permit of your figuring the extension of this ore to parts of the mine vertically, or approximately so, below the old stope of the Pioneer. The part of the mine where the interference of these flat veins is noticeable is marked by much kaolin, which occurs in irregular earthy patches, and a similar thing is noticeable in one of the rock strata near the breast of the long crosscut. This to me plainly indicates that your work on the 265-ft. Level, which is the only work that approaches near to the old stope, has been done on a horizon which is too low relative to the levels which develop the ore body of the bonanza stope in the Pioneer; so that while this work touches ore in one or two places about this part of the Indiana ground, it does not develop the oreshoot.



My recommendations are, first, that you put up a series of raises, intelligently spaced to prospect the vein of the west side of the green tuffaceous rhyolite (25. ft. thick), and that this be done in extension of the work which, about the present raise, once broke into promising ore values. Next, that a raise be put up following the attrition clay seam next to the green rhyolite that shows in the end of the main crosscut. In my judgment this latter work will lead into ore which is closely connected with the oreshoot of the bonanza stope.

In order to carry out this plan it will be necessary to enter into a friendly agreement, legally drawn, with the Pioneer Mine, which will permit of connecting your workings with their workings at some point most convenient to both parties. This mainly for purposes of ventilation, which is badly needed in both mines, - in the Indiana more than in the Pioneer. If such an arrangement were carried out it would be easy to connect up with the air line from the compressors of the Pioneer Mine and to get a supply of air for the use of machine drills on stoping ground.

Similarly, later on in the ultimate project, an arrangement could be entered into with the Pioneer owners providing for the development of their spring, and thereby the enlargement of their water works, so as to supply any mill which you might be warranted in constructing on your ground for the beneficiation of your ores.

In conclusion, I firmly believe that ore can be developed in this property which will be sufficiently profitable to reimburse your owners for all capital outlay made up to this time and to yield a commensurately good profit over and above all future outlay.

Respectfully submitted,

Dated at  
Denver, Colo. Feb'y 16, 1914.

FORBES RICKARD MINING ENGINEER.



EDWARD A. CLARK  
32 COMMERCE STREET  
HOUSTON

Check returned by  
Walter G. Swart

January 23rd, 1915.

Mr. W. G. Swart,  
1218 Foster Building,  
Denver, Colorado.

My dear Swart:

Messrs. Morley and Kiser, who hold an option on the Indiana-Nevada Group of Claims located in the Pioneer District, formerly owned by one Millikan, have been to see us in reference to this property.

I have looked back and found your correspondence of May, 1909, with reference to a trip which you made to investigate this particular property and the camp. Since that time a settlement has been made with the Bi-Metallic Company which resulted in the loss of the Indiana Shaft #2 and an angular area cutting off the Northwest portion of the Indiana claim No. 1. I am enclosing map showing the present lines and the territory now owned and controlled by the Indiana-Nevada Company.

They claim, that acting upon the advice of Forbes Rickard, they started development in the engineers shaft and have lately uncovered a new body of ore of promise. Messrs. Morley & Kiser feel that there is an opportunity in this camp to add to their holdings through the purchase of the Starlight Group and other adjoining property to still make this a profitable mining game, and as they are



Mr. Swart.

-2-

Jan. 23rd, 1915.

unable to carry it on and believe that our association would enhance their position, they suggest the following:

That we send an engineer to the ground to investigate the new exposures and the prospects of developing another bonanza stope, and if, upon his report, we are satisfied that there is a sufficient nucleus here to warrant the purchase of outside properties, that we take this property over at the most favorable figure which they can secure from the present interests, and add to it these adjoining claims, giving them a certain interest for securing the basis upon which to organize. Providing in our judgment the mine could not be operated successfully, except through amalgamation with the Bi-Metallic Company, that we would endeavor to make a consolidation with this Company, or work out some practical plan which would bring forth the best possible results; they to have a certain interest in our profits in either event.

I am sending you Forbes Rickard's report. After the experience that we had in Alaska with this gentleman, I have not much faith in his judgment as a mining engineer, but as he advised these new developments and the upraises which he sanctioned found the ore body in place, he evidently has, if the story is true, pointed them in the right direction.

They claim this new strike made through these upraises develops a body of ore 19' in thickness, lying hori-



Mr. Swart.

-3-

Jan. 23rd, 1915.

zontally about 130' from the surface. They made the upraises from the 230' level. Above this 19' vein they have still found another ore body of hard cherty material which pans extremely well in free gold. I do not believe that they have drifted very much upon this new find, but they claim to have it opened up by two upraises 100' apart and and it shows every indication of being in place and worthy of further exploration.

Now, you know more about this mine than all of them put together and being acquainted with Wingfield and knowing the liability of further conflict on account of the apexing of this ore zone on the Bi-Mettalic ground, should be able to decide whether or not these statements are of sufficient interest to warrant our endeavor to make something out of it. Unless it could be developed into a big thing, it would not interest us, but if it did not interest us and was sufficiently interesting to the Bi-Mettalic people for us to make a trade with them which would divert profit in our direction commensurate with the task, Mr. Clark might consider sending you out to investigate. Of course this is all dependent upon the price which they will offer us - which they are now endeavoring to secure from the present owners.

Mr. Morley wished me to state to you that if there was any possibility of combining with the Bi-Mettalic



Mr. Swart.

-4-

Jan. 23rd, 1915.

people, that it was very necessary to keep this from Mr. Milliken, as it was like waving a red flag before a mad bull to bring up any prospects of a consolidation with the people who had beaten him out through the Courts.

Please advise me by night letter your opinion in regard to this.

With kind regards,

Very truly yours,

*Francis E. Young*

Enc.  
FEY/M



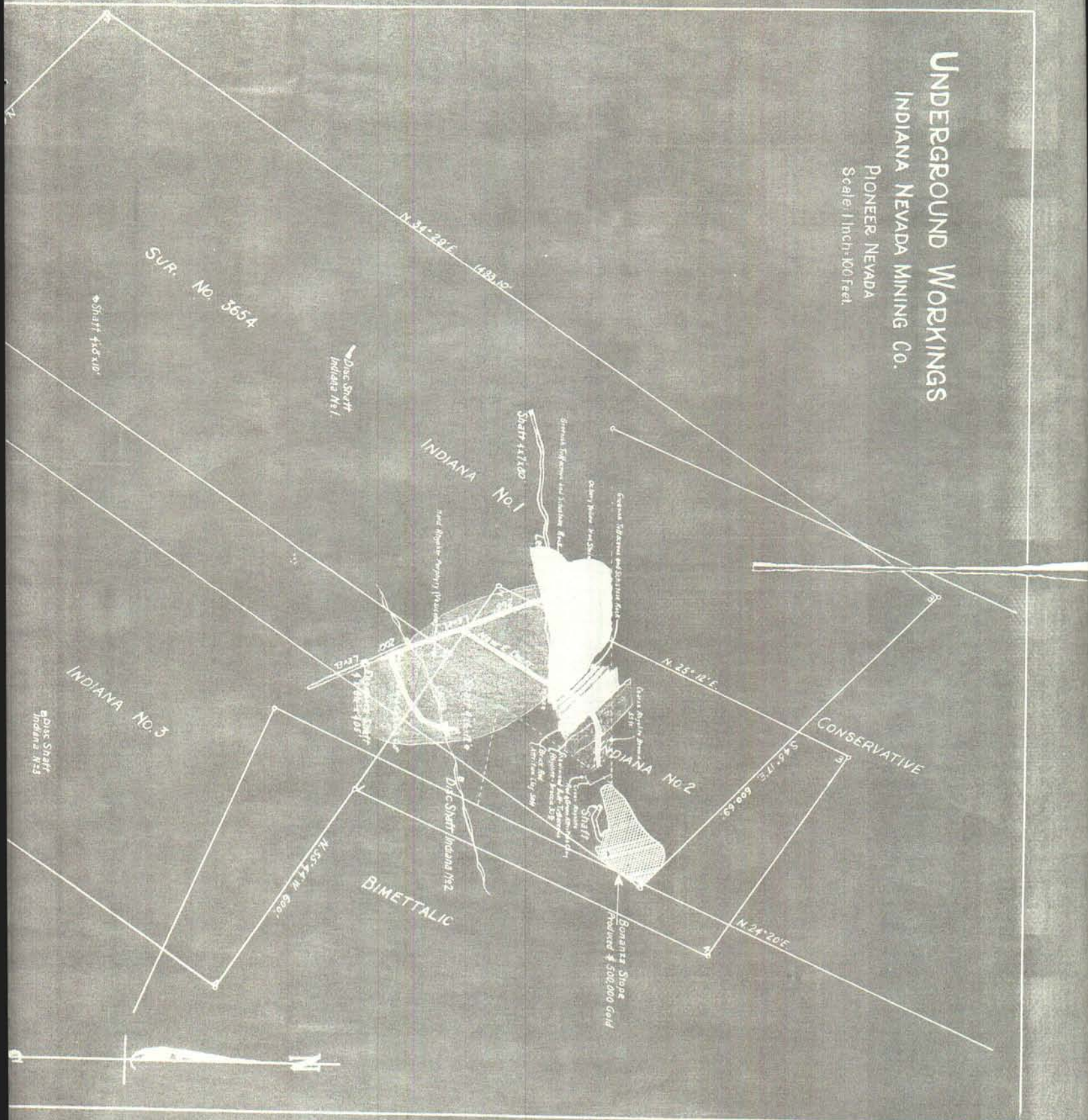




INDIANA NEVADA MINING CO.

PIONEER, NEVADA

Scale 1 inch=100 feet.





Accompanying Report Of  
FORBES RICKARD  
Mining Engineer



Accompanying Report of  
FORBES RICKARD  
Mining Engineer.

\* Starlight  
Have ore here

SUR. No. 3654

Shaft 4'x10'

Disc Shaft  
Indiana No. 1.

INDIANA No. 1

and Riggs Property (Indiana)

Bull's Shaft 4'x7'x10'  
Drift 4'x10'x10'  
Trench

INDIANA No. 3

Disc Shaft  
Indiana No. 3

Shaft

N. 34° 29' E.

BIMETALLIC

N. 55° 44' W. 600'

Disc Shaft Indiana No. 2

- ☐ GREEN RHINOCLITE
- ☐ ATTRITION CLAY - FINE & GRINDEN
- ☐ MAONIZED - BUFF TURFACIOUS RHINOCLITE BRECCIA
- ☐ COARSE RHINOCLITE BRECCIA
- ☐ GREENISH TURFACIOUS AND SEMI-TOSTE ROCK
- ☐ " " " " " " " "
- ☐ BRICK RED - ATTRITION CLAY
- ☐ HARD RHINOCLITE PORPHYRY (Vesicular)
- ☐ OCHREY (Yellow) Iron Stained Rock.
- ☐ FRACTURES AND WATER COURSES

30 ft  
55 ft  
44 ft  
25 ft  
54 ft

WESTERN HISTORICAL MANUSCRIPT COLLECTION



American Zinc Co., Walter G. Swift Files, Folder

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Accompanying Report of  
FORBES RICKARD  
Mineral Engineer

\* Starlight  
Have ore here

SUR. No. 3654

Disc Shaft  
Indiana No. 1

INDIANA

Buller Shaft 4517.5 ft  
4517.5 ft

INDIANA NO. 3

BLANCK



MINERAL ENGINEER  
FORBES RICKARD  
MINERAL ENGINEER  
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MINERAL ENGINEER  
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