Report on the Property of

POTOSI ZINC CO.,

Las Vegas, Nev.

In this report there is first given a statement of the capitalization, location, operation, etc., of the Potosi Zinc-Lead Mining Co. and of the Potosi Zinc Co., together with an estimate of the tonnage of both lead and zinc and the approximate profit which the writer believes could be reasonably expected from the operation of this property. Following this is a more detailed statement concerning the property, and suggested methods of operation. Also accompanying the report is a map of the underground workings and plat of the claims belonging to the company, together with the following tables:

Table No. 1 - Comparison of Taylor & Brunton assay returns on ore shipped with mine assays.

Table No. 2 - Daily assays of

(1) Coarse sorted ore.
(2) Fines under grissley.
(3) Face samples.

Table No. 3 - Sales of ore of Potosi Zinc-Lead Mining Co. from Jan./06 - July/07, incl., giving weights, prices and assays.

Table No. 4 - Statement showing cost of mining from July/06 - Dec./06, incl., tonnage shipped and estimate of cost of mining.

Table No. 5 - Sales of ore of Potosi Zinc Co., Sept. 25/08 Nov. 30/08, giving weights, prices and assays.

Table No. 6 - Cost of operation of Potosi Zinc Co. from July/07 - Nov. /08 incl. (Note: Ore was shipped by this company during Oct. and Nov./08, and the cost of operation for these months is taken as basis for estimating the cost per ton of mining.)

POTOSI ZINC COMPANY.

(Successor to Potosi Zinc-Lead Mining Company).

Organized under the laws of Nevada.

Capitalization--- $2,000,000.00 (Shares $1.00 each)

Issued stock.....$1,225,000.00

Treasury "..... 775,000.00

(Figures furnished by P.G.Gray, Pres(t of the Co.)

Location--- "Good Springs Mining District."

Section 1--12--13, Township 23 South, Range 57 East; Lincoln County, Nevada. 30 miles south-west Las Vegas and 20 miles west of Arden on the S.P., L.A. & S.L. Ry.

Indebtedness---

(Figures furnished by P.G.Gray, Pres't of the Co.)

Due on purchase price -- ($152,000.00)-----$50,000.00

Other indebtedness to Feb. 1, 1909,

including interest $1105.34..... 51,882.51

$101,882.51

($16,000.00 is, possibly, questionable as being a company liability.)

Operation---

Time-- Potosi Zinc-Lead Co., 1-1/2 yrs.-Jan.'06--July '07.

Potosi Zinc Co., July '07----date.

Sales-- First company (Jan. '06----July '07)

Zinc-10,829 tons (dry wt.)...$234,684.44 (value)

#Lead- 331 15,119.61

11,160 $249,804.05

#Lead practically 3% of total tonnage.

Zinc-AV.price per ton $21.945 #Cost 3.25 mining
5. hauling
10. freight
.25 sampling
.09 assay
18.59

AV.cost (est) " 18.59 #

AV.profit " 3.355

AV.assay-Zinc 35.72; Lead 7.0; Silver 3.875(oz.per ton)

AV.price spelter during time of shipment $6.00 St.Louis

Lead-AV.price per ton---$46.25

AV.cost (est) " 8.25 #

AV. profit "---$ 37.00

#Freight, sampling, assay, etc. allowed for in net price received.

AV.assay---

Lead--60.84; silver 10.27 (oz.per ton); zinc 9.46

Does not business terms -- (½ res'000'00)-----100'000'00

Sales--Second Company--Sept. '08---Nov. 30/, '08.

Zinc-- 1179 tons (dry wt)----------$14,983.73

Lead# - none (40 tons - 60% lead on hand)

#Lead a little over 5% total tonnage.

Zinc--AV.price per ton $12.76 #Cost 3.462 mining
5. hauling
8. freight
.25 sampling
.09 assay
16.805

AV.cost (est) " 16.805#

AV. loss " 4.045

AV.assay--Zinc 33.82; (Lead and silver not determined)

AV.price spelter during shipments $4.75,St. Louis .

Assets.

Claims--mining-----14; (1 patented--13 assess.work done; $30.00 to patent each claim.)

mill site- 6;

timber---- 2;

Plant and equipment-----$10,000.00

Mine-----Blocked out------75,000 tons.

	tons		
Zinc-----	71,250----	Assay 35.00% zinc---10% lead#	
Lead-----	3,750----	Assay 60.00% lead---10 oz.silver	
	75,000		

#In past high lead ore avoided.

Shipping product and value--WITHOUT CONCENTRATING MILL#

75,000 tons--80% recovery (that is,20% lost in handling)

60,000 " --Zinc 58,200 tons; lead (3%) 1,800 tons.

Zinc--58,200 tons --(price)--$16.50--value--$960,300.00

Assay-Zinc 35%--lead 5--7%

Spelter 5.00 St. Louis.

#Note: In this est. it is assumed that the grade of ore which would be recovered is practically the same as that shipped in the past; and the price is figured on a 5.00 spelter basis.

Costs...Mining...	2.00	
Hauling..	2.00	
Freight..	8.00	
	12.00	698,400.00
	Net profit	$262,100.00

Lead-1800 tons--price $45.00...value..81,000.00

Assay-Lead--60%; silver 10 oz.

#Costs-mining---	2.00	
hauling--	2.00	
	4.00	7,200.00
		73,800.00
		73,800.00

Net profit of both zinc & lead - $335,900.00

#Freight, etc., allowed for in price per ton of lead ore.

Ship. product & value- WITH CONCENTRATING MILL.

In the following estimates of recovery and possible profits with a concentrating mill, the figures are not based on the known work of any definite type of concentrator adapted to

this ore, but are based on general principles of concentration, and are believed to be an approximate of the costs and of the results which could be obtained with a concentrator.

(1). Dump from old Mahoney lead workings.

3500 tons..Assay..26.81% zinc
21.21% lead

(2). Mine dirt

75,000 tons.....80% recovery

60,000 " (There would be 15,000 tons of waste dump, run 10% zinc; possibly could be treated in mill, but not considered in estimate.)

Note: If mill erected, would work a higher per cent of lead in ore; that is, would recover 5% of total tonnage as coarse lead and fines should run 10% lead.

ORE RECOVERY.

(1).

3500 tons-(old Mahoney dump)--26.81% zinc; 21.21 lead.
3500 X 26.81 zinc---938.35 tons zinc---2345 tons 40% zinc ore
3500 X 21.21 lead---742.35 " lead--- 990 " 75% lead ore

2345 tons X 80% recovery--1875 tons 40% zinc ore recovered (final product)
990 " X 80% " 790 " 75% lead ore recovered (final product)

(2).

60,000 tons-(mine dirt)-5% coarse lead-3000 tons-60% lead (final product)
57000 tons-35% zinc
57,000 " = 25% coarse zinc= 14,250 tons 40% zinc (final product)
42,750 tons-33-1/3% zinc--10% lead

42,750 " = 10% lead=4275 tons 75% lead-80% recov.=3420 tons (final product)
38475 " 35% zinc ore, or
38,475 " 35% zinc=33665 " 40% zinc-80% recov=26932 tons (final product)

VALUES.

Mahoney dump--	1875	tons...	40% zinc	at 21.50....	40,312.00
	790	" ...	75% lead	55.00....	43,450.00
Mine	3000	" ...	60% "	45.00...	135,000.00
	14250	" ...	40% zinc	21.50...	306,000.00
	3420	" ...	75% lead	55.00...	188,000.00
	26932	" ...	40% zinc	21.50...	579,038.00
					$1,292,275.00

#Costs..Zinc..	handling	.50)	
	mill	.50)	$1.00 lead
	hauling	2.00...	2.00
	freight	8.00	
		11.00	3.00

COSTS.

#(1875 X 11.00	$20,625.00	
(790 X 3.00	2,370.00	
3000 X 4.00	12,000.00	
14250 X 12.00	171,000.00	
3420 X 4.50	15,390.00	
26932 X 12.50	336,650.00	
		558,035.00

Profit with mill.....$	734,240.00
Profit without mill.....	365,700.00

GENERAL STATEMENT.

The Potosi Mine is located on the abrupt, west face of Potosi Mountain, the tunnel level being at an elevation of 6200 feet above sea level and about 3800 feet above Arden, the shipping station on the S.P., L.A. & S.L.R.R. Above this tunnel level, the mountain rises about 200 feet and forms a long, general north-south flat top ridge.

The general country rock is rather flinty magnesium lime stone of Paleozic age, which in the section in which the mine occurs has a dip of about 10 degrees to the south-east. In detail, so far as the property has yet been developed, the ore occurs more closely associated with a phase of this lime stone, which contains a horizon 6 to 10 feet thick of thin bedded, fine grained lime stone, locally called the "shale". Structurally, the rocks of this region have been extensively faulted, this faulting being manifested both by throws of great magnitude and by many smaller throws. Also, there has been considerable intrusion of igneous rock, locally called "porphyry". Again in detail, there has been very considerable disturbance of this part of the lime stone series in which the Potosi ore body occurs, and it is believed that the relation of the occurrence of the ore to the disturbance of the country rock is a genetic one. The most significant of these local disturnances is the fault plane which occurs at the east end of the present workings, extending in a direction a little east of north, the plane of the fault dipping about 50 degrees to the east. From the bending down of the shales on the west side of this fault,

and from the nature of the lime stone which occurs immediately on the east side of the fault, it is believed that the up-throw side of the fault is on the west, and the down-throw on the east. The magnitude of the throw of this fault is uncertain. The only evidence bearing on this which the writer has is the fact that the shaft shown on the north-east corner of the tunnel level workings, on the accompanying map, did not strike any shale in a depth of about 40 feet below this level. However, from the similarity of the lime stone of the east side of the fault, at the tunnel level, to that which occurs in the uppermost workings of the mine, it is not believed that the throw of the fault is of great magnitude. In the workings of the mine, nothing which could be clearly determined as porphyry was found along this fault plane, although in the sheared fault zone, there is very completely altered rock which could either come from the shaly lime stone, or from the porphyry. Also, the fact that in the shattered fault zone, in the mine, considerable unaltered zinx sulphide occurs may indicate the nearby presence of the porphyry.

As stated above, the ore body, so far as developed, occurs in this shale-bearing portion of the lime stone series. Almost the entire development work has been done above the shale, the shales nowhere extending up as high as the tunnel level. That the ore does occur in and below the shales is shown in the winze which was sunk about 40 feet north and a little east of the hoist, (see map), and which, when sampled

by the writer, ran 34.4% zinc and trace of lead. Also, in the shaft just north of Station 35, immediately under the shales, very fair looking ore occurs. Concerning the ground still deeper below the shales, the information at hand is only negative; that is, the only place where work has been done in this horizon is in the shaft and the drifts from the shaft. This work has not, as yet, shown ore.

The ore, itself, occurs almost entirely as definite sheets of varying thickness, from a few inches to 5 and 6 feet. The course of these sheets is very irregular, some times running nearly flat along the bedding of the lime stone and then, again, cutting directly or diagonally across the beds. In places, also, the sheets are so thick and so close together as to form "chimneys" of ore. While, as yet, no considerable amount of ore has been shown below the shales, the maximum height above the shales, through which the ore occurs, has not been reached by any of the present workings. The greatest height to which development work has yet gone is about 75 feet, and in the top of several of these raises, very strong ore is still going up.

The general distribution of these sheets in the ground so far developed is well shown by the map, the only parts of the entire workings which did not make a favorable showing of ore being the following:

(1). North half of #2 drift, upper level.

(2). No. 1 cross cut, upper level.

(3). That part of the drift running north on the tunnel level.

(4) The drift running east from the hoist (just S.E. of Station 9.)

(5) The shaft north of Station 35 and

(6). The two drifts running south and north-east from the bottom of the shaft.

The ore, with the exception of a little zinc sulphide, mentioned above as occurring in the fault zone at the east end of the workings, is entirely an oxizided product,- zinc carbonates, silicates and, perhaps, oxides. In color, the ore varies from a pure white to dark gray and reddish iron stained ore.

In physical character, it varies from a fine powder through a soft porous crystalline mass, to a dense, hard crystalline ore. In shooting, much of the soft porous ore breaks up into fine material so that in the assorted product, which is shipped, the part which will pass through a half-inch grizzley is to the part which is coarser than this as 3 or 4 to 1.

In grade, the ore varies from the unaltered lime stone as the lower limit up to as high as 48% zinc. From the accompanying tables, it will be seen that a fair average of the entire 12,000 tons of zinc ore shipped is about 35% zinc, and this was obtained by means of the very crude method of hand sorting. So far, about 3% of the total tonnage shipped has been recovered as coarse lead ore, which will run about 60% lead and 10 ounces silver. Besides this coarse lead, the zinc ore shipped has averaged about 7% lead, which has been broken up too fine to be separated from the zinc by hand. As the method of cleaning

the ore has been so crude, it has been necessary to largely avoid mining the places where the greatest amount of lead has occurred, and, therefore, the writer believes that if a satisfactory mechanical concentration can be employed, the lead (and consequently, the silver) contents of the ore can be materially increased in mining.

The ore body, as at present developed, is clearly shown by the accompanying map. A thing to be noted from the map is that very considerable development work has been done on three distinct levels; (1). the tunnel level; (2). "the old workings" extending from the tunnel level to 20 feet above the tunnel level, and (3). the upper workings, 40 feet above the tunnel level, together with several raises extending 20 and 30 feet above the floor of this upper level. In addition, attention should be called to the under-hand stoping which has been done in the tunnel level between Station 4 and 5, near Station 7, between Stations 7 and 8, and the winze north of the hoist. In each of these places, very good ore is shown in the lowest workings.

For purposes of estimating tonnage, the writer has taken 500 feet east and west, 240 feet north and south, and 75 feet vertically, which has been proven by present development work, and estimating 12 cubic feet to the ton gives 750,000 tons, which, it is believed will run at least 10% ore, giving 75,000 tons of ore blocked out.

In reference to additional tonnage, it is confidently believed that a very considerable amount of ore occurs in the area south of the tunnel level and west of the north-south

fault plane, which occurs at the east end of the present workings. Wherever prospecting drifts or stopes have been driven south of the tunnel level, very good ore is shown. How large additional tonnage can be developed here, is, of course, simply a question of fact, but the development work thus far has shown nothing to cut off the ore in this direction. As the country rock has a general dip to the south, it is probable that if an important extension of the ore body is determined to the south of the present workings, it will be necessary to mine same from a lower tunnel level, or from a vertical shaft extending to a lower level.

Vertically, it is also simply a question of fact as to the height to which the ore body will extend. It must be remembered that this is a new zinc district, that it has its own peculiar characteristics, and that nowhere has a large body been worked sufficiently to lay down general principles such as can be done in many of the older zinc districts.

The possibility of ore to any considerable depth below the shales is also an open question, but the small evidence at hand is not especially favorable. That is, the shaft just north of Station 35 was sunk 100 feet below the tunnel level and except immediately below the shale did not show any favorable indication of ore. As shown by the map, drifting was done south and north-east from the bottom of the shaft without finding ore. In the north-east drift, near Station 34, the country rock is very much broken up and cemented with

"lime spar" (crystalline calcium-magnesium carbonate) and at one place showed considerable red iron staining, but, so far as the writer could observe, no ore. The broken country rock at this point may possibly indicate an approach to the north-south fault plane shown in the tunnel level. It would seem to the writer that, if it is desired to prove the deeper ground, by under-ground work, this would best be done by sinking a winze down along the fault plane where, as stated above, some sulphide ore is found.

To the east of the present workings,- that is, to the east of the north-south fault plane,- the evidence of ore is also negative. The only work done here is in the drift running directly east from the hoist. In this drift, no ore is seen. In reference to this area east of the fault, the writer believes that an effort should be made to locate the shale beds which occur near the apparent base of the ore on the west side of the fault, and to then prospect this east area.

In reference to prospecting the possible extensions of the present ore bodies, as well as the additional property of the Potosi Zinc Company, the writer believes that this could be most economically done by means of churn drilling. On none of the other claims, was there any considerable showing of zinc at the surface, although in a number of places some zinc is found. On none of the claims was the surface showing as strong as that on the face of the mountain where the present tunnels have been driven. However, there is opportunity for considerable more surface prospecting on all

the claims, and it is also possible that, even where the surface showing is not strong, a body of ore may be developed by following into the mountain. Throughout the "Good Springs District" zinc occurs frequently, but at the present time, only two properties besides the Potosi, have been developed into shippers of zinc ore - these are the Monte Cristo and the Kent, from neither of which, however, is a large tonnage yet procured.

RAILROAD TRANSPORTATION AND WAGON HAUL.

Thus far, it has been necessary to haul the ore by team and wagon to Arden Station on the S.P., L.A. & S.L.R.R., a distance of 20 miles. From Arden, it has been shipped to Kansas smelters, the freight charge being $10.00 per ton at first, and at present $8.00 per ton. The only possible, although not at present practicable, competing shipping point at present is Ivanpah on the A.T. & St. Fe R.R., a distance of about 35 miles south of the mine. However, the country between Ivanpah and the Potosi mine is being gradually settled, and, locally, it is hopefully believed that the Sante Fe will, in the near future, extend the line to Sandy, about 10 miles south of the mine. If this should be done, it would be of great benefit to the property, not only in affording a possible competing shipping point, but in giving a very much easier haul of the ore to the railroad, or even of running a spur track to the mine.

The present haul to the railroad has been done by teams

at a contract price of $5.00 per ton. This cost, in itself, almost makes profitable mining impossible. However, the writer would feel very confident that, by substitution of gasoline traction engine haulage, in place of teams, this cost could be reduced to $1.50 or $2.00 per ton. The wagon road the entire distance from Arden to the mine has an excellent roadbed - hard travel with very little sand. In going out from the mine loaded there is first about two miles of up-hill pulling, the steepest grade, however, being 5%. From this summit there is about four miles down grade. The four steepest grades on this part of the road were measured, giving 3.7%, 4.7% and .3% and 13%. Of course, these grades only affect the light haul in to the mine. Immediately at the foot of the mountain, the present road goes over a small hill on a 10.45% grade. From this point to Arden, a distance of 14 miles, it is a uniform, gradual descent. There is no question but that with very little expense all grades over 8% can be eliminated, and from a hasty examination, it appeared that the route over the small hill at the foot of the mountain (which gives the greatest grade for loads going out, could be abandoned and the road kept on a continuous grade downward from the summit to the railroad.

FUEL, WATER AND TIMBER.

Steam coal shipped in from Salt Lake cost $10.00 to

$12.00 on the railroad. Crude oil, from California, costs 5 to 6¢ per gallon at the railroad. California Oil distillate (gasolene) cost 14¢ per gallon at the railroad. It is apparent that the crude oil, or the distillate, is the most economical fuel, and, in fact, is not an expensive fuel.

The water supply of the property is obtained from two springs of about equal volume, each estimated at about 25 gallons per minute. It was stated at the mine that the quantity of water from these springs does not vary with the seasons. If a greater supply of water was necessary, it would probably have to be obtained by drilling for an artesian flow or for pumping. No water occurs in the mine working.

Small stub cedar occurs on the top of the mountain on practically all the claims, furnishing fire wood and small timbers for mine use. The company is said to own timber claims some distance north of the camp, from which, very good dimension timbers and lumber for minework could be obtained. These timber claims were not visited by the writer. However, it should be stated that the walls and roof of the mine are so good that little under-ground timbering will ever be necessary.

SUGGESTIONS FOR IMMEDIATE FUTURE WORK.

To the writer, it appears that there are three essentials to be worked out in order to assure a reasonably profitable operation of this property,- (1) Reduce the cost of hauling;

(2) Reduce the cost of mining, and (3) Effect a better separation of the lead and zinc, and, possibly, lime.

(1). Hauling. It is believed that until such time as it may be practicable to have a railroad spur directly to the property (if shipping on the Sante Fe) or to the foot of the mountain (if shipping on the Salt Lake Ry.), the cost of hauling can be reduced from $5.00 per ton to $1.50 or $2.00 per ton, by gasolene traction haulage. It would seem well to take up the matter with gasolene traction engine manufacturers, and see what, if any, quantity they would make on such a proposition.

(2). Cost of mining. From the best figures the writer could obtain, the past cost of mining has been between $3.25 and $3.50 per ton on ore shipped. By substituting large air hammer drills which could be operated by one man in place of the hand steel work, by systematizing the underground work with a view of mining instead of development entirely, by assorting the ore on a travelling belt instead of the stationary platform now used, and by moving the aerial tramway from its present location to a point at the foot of the mountain immediately below the mouth of the tunnel and thus eliminating one-half mile of mule haul, the cost of mining should be materially reduced. It is on the basis of these changes that the estimate of cost in the figures of possible profit are based.

It would take a comparatively small sum of money to install a small air compressor and about three air hammer drills, and, also, to install a travelling picking belt. The

air compressor could be driven from the gasolene hoisting engine which is now installed on the property. If this were done and a small crew of men were set to work, it would be possible within a short time, to demonstrate very closely what the cost of mining this ore body should be. If the results were satisfactory, then one would feel warranted in working the property on a larger scale, and in making the more extensive improvements which might be necessary.

(3). Separation of lead and zinc, and, possibly, lime. The proportion of fines which is obtained in even the present system of handling the ore is so great, and the percentage of lead contained in the fines so high, that, if possible, these should be treated in some way to both bring up the percentage of zinc in the final product, and to obtain, as a marketable product, the fine lead and accompanying silver values. It is believed that the ordinary wet methods of concentration will not be practicable in this case, for several reasons. In the first place, a large percentage of the ore, when broken by shooting on the grizzley, goes into a fine powder, which in wet concentration would be carried off by the waste water. Also, a considerable portion of the ore, and particularly much of the highest grade white ore, breaks up into small flat particles, which in spite of their high specific gravity, would tend to float off in the waste water. A part of this could be recovered in settling tanks, but these would have to be of large capacity, and even then it is believed that the losses would be high. Some form of dry

concentration would seem to be the practicable method to employ. The writer has no definite process to recommend but would suggest that the Sutton-Steele pneumatic tables be looked into.

Another suggestion for handling the production of this and other properties in this vicinity, is, the possibility of a smelter for the production of spelter or a zinc oxide plant for the production of zinc white pigment. The practicability of this, however, can only be determined by the development of a sufficient ore supply, and, also, by an investigation of the commercial features on the Pacific Coast in reference to the fuel supply (the California oil fields) and the market for the spelter or the zinc white pigment.

February 3rd, 1909.

(Signed) W. N. Smith.

Potosi Zinc Co
near Goodsprings
Nevada

30

Item 78

REPORT
of the

POTOSI MINE

Arden, Nev.

by

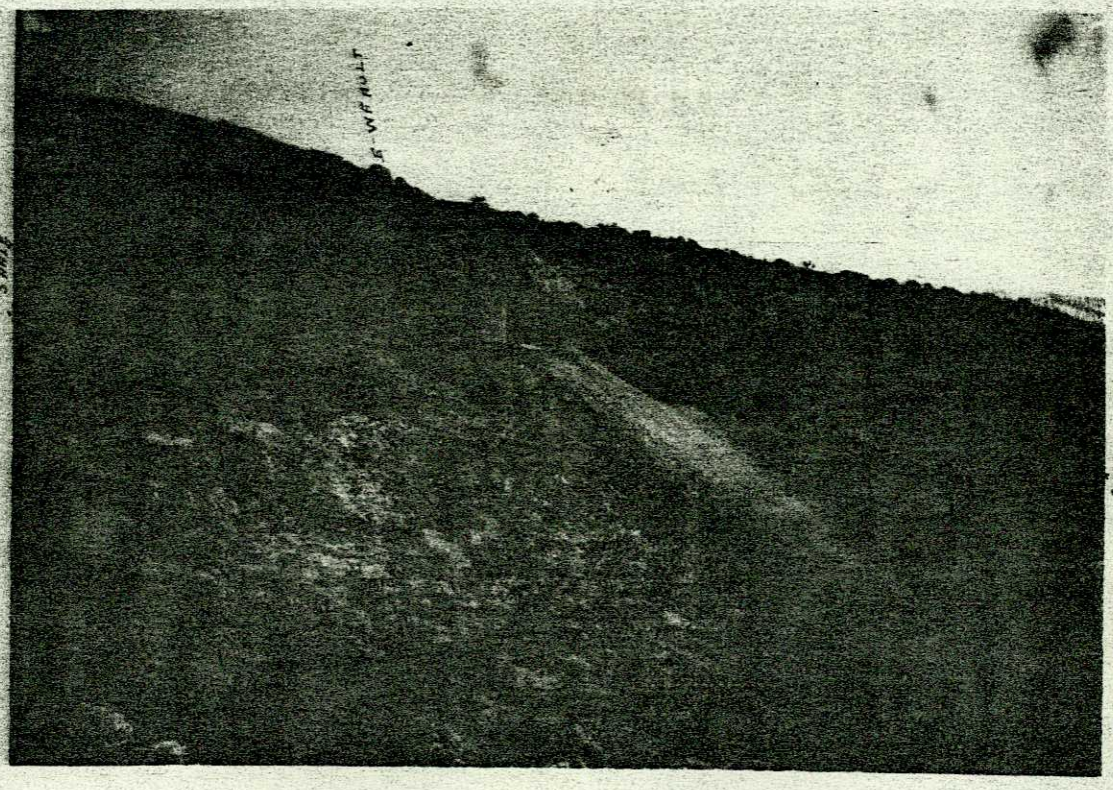
W.F. Disbrow,
Oct. 30 '11.

INDEX.

Climate,2
Costs:Analysis,16;Causes of high,15;Character Relpacement 8,
Conclusion,18,19.
Dressing of Ores,3.
Faults,6
Geology,7:Gas Tract Engine,14.
Immediate Prospects of Mine,8.
Location,2:Labor,15.
Minerals,3,Milling Ores3,Main solution Channel 8.
Ownership,2,Ore in Sight 10,Ore reserves,12.
Property,2:Prob.Ore,10,Profits,17,Poss.Ore,11
Present Condition 19,Prospects Future,18.
Value Ore 17,Value Mine,18.
Wagons 13.
Yellow Pine Mill,3.

POTOSI MINE.

Bluff and Portal of Main Adit.



Showing shale and the ore bearing and upper beds.
The East-West Fault is also shown.

LOCATION:

The Potosi Mine is in Clark County,Nevada,about 20 miles West of Arden which is on the S.P,L.A,& S.L.R.R.The mine itself is worked through an adit on the west side of a cliff and the ore is conveyed to the head of a short aerial tramway by a narrow gauge surface tramway.

The local arrangements may be seen from the blue print marked"Surface".

PROPERTY:

The property consists of 25 claims,one of which,the Potosi, is patented,and the remainder of which are surveyed and application for patent made.

There are also six mill sites to protect the camp and springs.

OWNERSHIP:

The Potosi Mine is owned as property of the partnership of Mahoney Bros of San Fransisco,who have abstracts of a clear title to the claims.

CLIMATE:

The climate is semi-arid and thereis only sufficient water in the springs now developed,for domestic purposes.

TIMBER:

The mine requires little timber and such as is needed is available on nearby hills.

MINERALOGY:

The gangue is a siliceous limestone, and the ores themselves are a replacement of this lime.

Nearly all the ore shipped as zinc is Smithsonite. There is little Calamine, the silica combining with the lime rather than the zinc.

There are some bunches of Blende but they are neither large enough to mine, or frequent enough to run up the sulphur in the carbonate ores.

The lead occurs as a semi oxidized Galena, i.e. a mixture of Galena and Cerussite.

DRESSING OF THE POTOSI ORES:

The lime and lead are now eliminated from the zinc by cobbing and hand sorting, but it becomes interesting to know if a mill might not be more desirable.

With the object of learning this the Yellow Pine Mill was visited. This mill at Good Springs was running at the time of the visit, and although the ore is somewhat more complex than that of the Potosi Mine, it is thought that the mill conditions would be fairly similar.

The lime which is coarse is eliminated from a picking belt. The ore is then crushed, rolled, and screened to two sizes on Colorado Impact screens. The two sizes are delivered to two Hartz jigs. The lead concentrates (coarse) from the jigs are saved and the middlings are reground and sent with the tailings to Overstrom classifiers and thence to Overstrom tables.

The Overstrom tables save the tailings for zinc carbonate ant the concentrates for lead concentrates.

There is an attempt to cut out a lime streak on the tables but it is not successful, and the zinc concentrates only run about 28% zinc, while the lead concentrates carry about 15 % zinc chiefly in the form of slimes.

The trouble with the ore is that there is no definite demarkation between the ore and the gangue, all stages of replacement being present and there are no definite specific gravities to work with and no amount of classification will alter this factor in any way. The Overstrom classifier is a good device, and while the tables would do better work if they had diagonal riffles (In other words if they were not Overstrom tables) they no doubt indicate what any table would do with the ore in a general way.

Furthermore the amount of slimes observed in the Yellow Pine products is very great and this alone would be a drawback to milling.

It is thought that the nearest approach to any success in milling would be a simple jigging out of the coarse lead after careful sorting out the lime. The tailings from the jigs could then be all saved for zinc. It is easy to figure, however, that this would not pay.

Careful hand sorting seems to be the best scheme for the handling of the ore.

With regard to the low grade ores it is thought that the lack of distinction between the gravities of ore and gangue would prohibit milling by any present known method. These will have to be left in the mine.

GEOLOGY:

The Rocks;Their Relative Position and Thickness.

The Potosi Mine is situated in a region of much folded Paleozoic limestones,sandstones,shales,and quartzites.

Perhaps the most easily distinguished rock in the neighborhood of the mine is the so called shale,which is in reality a thin bedded limestone containing some organic matter.This shale may be considered as defining the lower limit of the ore.It is from 5 to 20 feet thick.

Directly above the shale is the ore bearing lime.This lime is about 30 feet thick .

Above the ore bearing limestone is about 200 feet of another heavy bedded lime.

The latter lime is capped with about 20 feet of sandstones and quartzites,extending to the surface.

There is a series of sedimentaries below the shale to unknown depth,and no igneous rocks are evident at or near the mine.

The dip of these beds near the workings of the mine and West of the North-South fault are to the Southwest at an angle of about 18 degrees.However on the South edge of the mesa above the workings the beds take a sharp dip to the South of about 25 degrees so that the ore bearing lime dips in under the bottom of the gulch below the South cliff.

The above relations can be seen by consulting the blue prints marked "Plan of Surface" and "Section K-K"

GEOLOGY:

The Various Faults and their Movements.

The workings of the mine are beneath a mesa which is bounded by cliffs on the North, South and West, and there is ample evidence of a great North-South fault passing through the mesa, as its escarpments can be seen on both the North and South cliffs.

This fault has an average displacement of about 80 feet, and the shale together with the rest of the formation on the East side of the fault is that distance higher than the similar formations on the West side of the fault.

This condition is shown graphically on the small blue print marked; "Orthographic Projection of the Three Principal Faults". The North-South fault plane will pass at right angles to the plane of the paper, and the block to the right or East is seen to be higher than the block to the left or West.

It will be noticed that there is another and older East-West fault which has itself been faulted by the more recent North-South fault.

In addition to the above faults there has been a bedding plane movement to the South on the part of the beds to the West of the North-South fault. This is a slip of the beds on top of the shale on the upper side of the East-West fault.

GEOLOGY:

Application of the Geology to the Mine.

Referring now to the plan of the mine it will be seen that the North-South fault is indicated as passing directly through the workings. It is shown on the plan as further West

in the upper levels of the mine than in the lower level, or, it has a dip to the East. Inspection of section CMMC (neglecting section I-I, projected on C-M-M-C for other purposes) will give a good idea of this fault and its relation to the workings. In this section the fault is shown as having a throw of about 60 feet, which is, however, a local condition, the greater throw being the rule.

The East-West fault is not shown on the plan, but it passes through the workings near the North end of the Second Upper Level, and it is this stepping up of the beds going North that probably accounts for lack of ore in the remainder of this level to the north. The ore would be above.

The bedding plane fault is not easily shown on the sections or plan. In fact it is not of great importance, except perhaps to help shatter the lime. However the sliding of the beds West of the North-South fault, to the South can be easily imagined, and it will also be seen that it will not affect the relative position of the various beds.

GEOLOGY:

Application of the Geology to the Ore Deposits

Considering that the ore is deposited largely in a certain bed of lime and that this bed dips to the Southwest away from the North-South fault, we have a general outline of the occurrence of the ore. In addition to this it must be noted that deposition has occurred subsequently to faulting and that the larger body is along the shattered zone caused by the North-South fault itself.

It follows then,as the fault affords the main solution channel,that the strength of the ore body will vary inversely as its distance from the fault.This is the case.Near the fault the lime in the ore has been largely replaced,while away from the fault,cracks have been filled.This is important both with regard to cost of mining and blocking out the ore.

Referring now to the plan of the mine and noting sections A-A,B-B,E-E,F-F,K-K,G-G,and H-H,it can be stated that these sections approximate the dip of the bedding planes.An inspection of these sections themselves will then show the various bedding planes,the stopes and the ore.

Section D-N-N-D should now be consulted and the following considerations noted.On this section alone the ore deposition does not,from the distribution of the stopes,appear to be confined to the ore bearing lime.This is accounted for by the fact that section D-N-N-D is on the fault plane itself,and the increased shattering by the fault has offset the natural resistance of the upper lime to replacement.In fact the shale itself is replaced in certain localaties along the fault.

GEOLOGY:

Application to Immediate Prospects of the Mine.

Under this heading will be discussed such ore as is so blocked out or developed as to indicate a reasonable certainty of its presence.In general,it is obvious that more ore can be allowed along the fault plane that in the beds away from it and that,except on the fault plane,the ore blocks must be confined to the ore bearing lime.

Furthermore(except in block A,the only fully developed block)the ore cannot be measured up accurately but the proportion of ore and lime in the partially developed blocks must be estimated from the exposures on their sides,and from the estimated amount of ore taken from the surrounding stopes.

The tonnage is surprisingly small considering the previous estimates that have been made,but it should be remembered that this mine has produced only about 20,000 tons during an operating period of nearly five years.

This is due to the fact that,except in some stopes along the fault plane,all of which are worked out except one,the ore occurs in sheets which have a thickness of from a few inches to ten feet,three feet being the average.These sheets are not clean ore but require careful sorting,and in addition to this careful shooting to separate the sheets themselves from the interven--ing lime.The result is a huge stope which has apparently made a huge production-and a large dump,high costs,and slow rate of working.

Furthermore in figuring tonnage all the probable producing ground cannot be used,on the ground that the whole mine should not be ~~taxed~~ searched for every possible pocket of ore in order to make up the purchase price.The good portions of the mine are all considered,but it is unwise to go too far away from the fault plane to get big ore.It will also be seen that most of the developed ore along the fault plane has been stoped.The blocks will now be considered separately

Corrections:

Page 12:In "Summary of Ore Reserves" instead of "Block F 2000 tons possible ore",read Block G,2000 tons possible ore. Also insert Block F.1000 tons,making a total possible ore of 5800 tons instead of 4800 tons.Total of three classes 15,700 instead of 14,700 tons.

Page 18:Under"Value of the Mine" read 5800 tons possible ore instead of "4800 tons probable ore" and total profit for this class of ore of $17,400 instead of"$14,400.

ORE RESERVES:

Ore In Sight.

BLOCK A:

This block is on the Second Upper Level where the ore bearing limestone abuts on the fault plane. This block is limited on the North by the East and West fault. Section H-H on the plan of the mine has been taken as its practical northern limit, while its southern limit is on the line where it joins Block B. Sections F, K, G, and H are passed through this block and its sectional areas respectively are shown on sections 1, 2, 3, 4 of the above sections. The average area of these sections which are about 30 feet apart is 1209 sq feet. The block is 90 feet long. It is estimated that 50% of the above contents would be clean ore of above 35% grade and not over 9% lead, with 25% more as probable ore.

Probable Ore.

BLOCK B:

This block is also on the Second Upper Level and represents the continuation to the South, along the fault and adjoining bedding plane, of Block A.

The block has an area on the horizontal plane of 2965 sq feet, and it is estimated that of the 30 feet of ore bearing lime, seven feet of clean ore could be assured. This low figure in comparison with the tonnage of block A is due to the fact that this block has been stoped out on the fault plane and the bedding planes must be looked to for the ore.

As this ore is not blocked out it must be called probable and there are about 1700 tons.

Probable Ore:

BLOCK C:

This is a continuation to the South of Block B. The area on a horizontal plane is 2850 sq feet and a thickness of 7 feet is estimated. Practically the same conditions hold as in Block B. The probable tonnage is about 1500.

Possible Ore

BLOCK D:

This block differs from Blocks A, B, and C in that it is not on the fault plane but is to the West of it and to the West of these blocks. Therefore according to the geological conditions existing in this mine we cannot allow the same tonnage per sq foot as in the former blocks.

The block is not developed, but from the average width of the ore taken out around it, the area of 4728 sq feet might contain a series of sheets which would yield 5 feet of clean ore. This would give a possible tonnage of 1900 for this block.

BLOCK E:

This block is still further Southwest along the bedding planes from the fault than Block D and the ore is, therefore, less abundant. A width of only 2 feet is estimated and of the area of 5656 sq feet there are 900 possible tons.

BLOCK F:

This block is taken to represent the ore along the fault plane, not that ore which makes off on the beddings to the Southwest, but the ore along the fault plane itself, dipping to the East and included between the Second Upper Level and the Main Adit Level.

Referring to Section C-B-C and the section of this block thereon, the area of the section of seen to be 680 sq feet and if it were about 25% ore it would develop about 1000 tons to the 100 linear feet. This is only possible tonnage and only 100 linear feet of the fault plane will be thus used. This will give 1000 tons of possible ore.

BLOCK G:

2000 tons of ore are arbitrarily allowed, as a matter of judgment, South of the present workings, on the fault and bedding planes. This will also be called possible ore.

ORE RESERVES:

Summary:

Block	Ore in Sight	Probable Ore	Possible Ore
A	4500	2200	
B		1700	
C		1500	
D			1900
E			900
F			2000
Total:	4500 tons	5400 tons	4800 tons

Total of three classes: 14,700

Past production of Mine about: 20,000

The above blocks may be all considered as ore above 35% zinc and below 9% lead.

In addition to this there is a larger tonnage than the above of the grades below 25% zinc, and a few hundred tons of assured lead ore of about 30% lead. These will be discussed under another heading.

THE COST OF MINING:

Transportation:

This factor is the greatest drawback to more successful operations at the Potosi Mine.

The freight rate from the loading station at Arden to Kansas points is $8.00 with no promise of any change or any reason why there should be any such change.

The mine is 20 miles from Arden over a good road, and it is doubtful if any further grading would further reduce any costs except depreciation of stock. At present two 8 horse teams leave the mine early in the morning, each team arriving at Arden with a wagon and trailer (each of 5 tons capacity) the same night. They leave Arden the next morning and arrive back at the mine that night, laying over a day before taking the next trip. Thus the hauling capacity with the two teams is 10 trips of 20 tons each per month. There seems to be little hope of reducing the cost of this hauling as fixing the road will only make it easier riding for the skinners without enabling them to get in another trip in a month, furthermore increased tonnage will have little effect in lessening hauling cost as the teams and skinners would have to be increased in proportion to the tonnage. This hauling can be contracted for $5.00 per ton, but by careful company management it can be and is now brought down to $3.50 - $4.00

Most of the heavy grades are within 6 miles of the mine and a tramway naturally suggests itself. However the ore reserves do not justify the expenditure of $30,000 on such a tram which might save $1.00 a ton and take five years to pay for itself!

A steam traction fired by crude oil has been tried on this road but was a distinct failure.

After this the gasolene traction engine shown below was used and met with somewhat better success, but there was much trouble on account of its inability to withstand the rough usage of ore hauling over desert roads. If this engine could have maintained some of its spasmodic preformances it could have hauled the ore for $2.50 per ton. However at the present time the engine is not in such a state of perfection as to permit its consideration at this time.

There is still the rail-road to consider. The nearest Santa Fe connection is at Ivanpah, 35 miles to the South. Should the Santa Fe ever build through to Salt Lake City, a very feasible route would be from Ivanpah, over Stateline Pass and thence North up the valley a few miles West of the Potosi mine. There is no immediate prospect of such a road being built however.

Neither does it seem advisable to consider a branch of the San Ped, L.A& Salt Lake R.R. from Arden to the mine. Such a road could be easily constructed, but at this time there is no tonnage for such a road at the Potosi Mine and no other possible tonnage on that part of the mountain.

Therefore it would be advisable to allow the hauling conditions to remain as they are and the hauling cost will be called $4.00 per ton.This will include loading ore into the wagons and loading it into cars.A couple of driving teams and an extra horse are also included in this.However the wagon repairs and blacksmith work are a heavy expense and it is thought that this is not all charged up to hauling on the books but that some of it is against the mine.

Labor

The cost of labor in the mine runs from $3.00 per ton to $5.00 per ton depending on the tonnage extracted.This is a serious drawback to successful operations.This cost is not due to big wages for Mexican labor is plentiful at $2.00 to $3.00 per day depending on class of work and general efficiency.

We must therefore look into other causes for the high cost of mining.This has been mentioned on previous pages.It is due to the occurrence of the ore itself.Taking the average cost of mining at say $4.00 it is probable that $2.00 of this is spent in eliminating lime from the ore in the three stages ie:first,the lime in place in the stopes(eliminated partially by careful shooting) second,the coarse lime remaining in the ore(partially eliminated by screening and hand sorting in the stopes)third,the final sorting of the ore on the picking floor of the ore bin.This is done well and successfully by the present management,so much so that it would be hard to improve upon.It is not thought that a picking belt woulf help much here as the ore requires too much hand spalling or breaking to sort out adhering lime chunks.Therefore on the above account a low tonnage per man per month (9 to 18 tons) is unavoidable and therefore also a high cost per ton.

It must be conceded that the $4.00 per ton cost includes

development costs. Indeed it is hard to tell where the mining leaves off and development begins in a lime mine of this nature, except in the case of a few long drifts in lime, for example the north drifts of the Main Adit Level and the North Drift of the Second Upper Level. This might be cut down some by putting on a couple of machines and would thus further decrease cost of development by opening up ore faster.

Considering everything, however, it is not safe to figure on a total mining, sorting, development, and delivering ore to wagons (it should be here stated that this is done by surface tram and a short aerial tram) of less than $4.00 per ton.

Other Costs.

A bookeeper at $75.00 is charged up against the mine. A superintendent at $200.00 will cost say $1.25 per ton. The mining and all labor is figured net to the men and in addition to this it takes 40 ¢ to run the boarding house. Other expenses such as freight, assessment work etc will cost say $1.30 per ton. Also boarding house supplies will run into $1.60 per ton. Furthermore supplies for the mine will cost about 50¢ per ton.

ANALYSIS OF THE COST OF MINING:

Summing up the above we have the final costs of mining about as follows: Transportation from Mine to Arden (hauling labor and supplies) $4.00. Mining Labor $4.00 (sorting development, delivering to wagons) Mining Supplies 50¢; Boarding House $2.00 (Labor and Supplies) General Expense (freight etc) $1.30 Supenintendence $1.25

The total cost is, therefore $13.00 per ton. In addition to this the ore must stand a freight charge to Kansas of $8.00

Therefore must then, stand a debit of $21.00 See detailed costs for several months on accompaning sheet.

THE VALUE OF THE ORE:

Following is an average assay of the ore shipped:

Zn	Pb	Ag	SiO2	Fe
37	10	4	5	1.3

Considering the lead below penalty and the zinc as the only value in the ore and using the scale upon which the ore is now being sold(ie.$22.50-35%Zn $6.00 spelter 5¢ spelter variation $1.00 % variation)the ore would be worth on an average $5.50 spelter market $22.00 F.O.B.Kansas.

Profit per Ton.

-$$$$$$$$$$$$$$$$-

The costs have been given as $21.00 F.O.B.Kansas

The net profit is,therefore about $1.00 per ton,on the average.If a tonnage of 200 tons per month could be produced, the costs could be cut down $2.00 and the net profit would be $3.00 per ton instead of $1.00.

Total Profits.

The Rate of Working the Mine must here be considered.

The ore in sight and probable ore can in all probability be worked out on a basis of 300 tons per month.In fact the average production of the mine has been above this rate in the past. However there are periods of decreased reserves which bring the tonnage below 200 tons for considerable periods.

Now on a basis of 300 tons per month the costs can undoubtetly be brought down to $9.50 per ton plus $8.00 freight to Kansas.Therefore for the probable and certain ore we can figure a net profit of $4.50 per ton.

The possible ore we must figure at the rate of 200 tons and a net profit of $3.00

The use of rock drills would be imperative to maintain the two figures last given.

THE VALUE OF THE MINE:

There are 4500 tons of ore in sight and 5400 tons of probable ore upon which we can figure a profit of $4.50 per ton This would give a net profit of $44,000.00

There are 4800 tons of probable ore upon which we can figure a net profit of $3.00 per ton or $14,400

Therefore the first payment should be something like $30,000 down and the ultimate price say $100,000 for the mine all payments after the first to come out of the net profits.

The first payment asked is $75,000 and the ultimate price is $200,000 The understanding now is that royalties will be imposed and that such royalties will apply on the purchase price, but in addition to this there is a series of deferred payments not yet determined upon, but which must be met at stated intervals.

This is the objectionable feature (in addition to the large first payment and final price) as it imposes all the risk on the purch--aser who must cut out his profits to make the payments and must lose all his previous payments if he decides to quit.

CONCLUSION:

This mine is far from being worked out or nearly so and while the technical ore reserves are small the future of the mine is good.

(a) FUTURE PROSPECTS

The future of the Potosi Mine lies in an extension of its ore bodies along the fault plane and the possibility of another ore body to the East of the fault and above the one on the

West side of the fault, which is now being worked.

Furthermore there is the possibility of a sulphide body or a further carbonate body to the South of the cliff in under the bottom of the gulch.

PRESENT CONDITION:

However the present conditions are such as to make it impossible to pay the price asked and the only proposition that could be made would be a payment of $25,000 down and a final payment of say $100,000 to be taken out of the mine.

Even in such a case the mine would be rather a source of desirable flux than a heavy dividend payer.

W. F. Wisbrow

Denver, Colo, Oct 30, '11.

Dated at Kelly, New Mexico, August 24th, 1911.

Visited this property June 30th, 1911. Geo. L. Felt with me.

Our time was very limited as we were on our way to sample the Green Monster on which our option had nearly expired.

Found the Manager, Mr. W. E. Smith, away and the mine running itself. We therefore had to size it up from what we could see with one of the miners as a guide. He knew nothing about assays or variations from mixed lead-zinc ore to clean zinc.

I had with me the map and report made by W. N. Smith of Platteville, Wisconsin. In a general way his statements as to geology, ore occurrence, etc., are apparently correct, but I do not agree with his tonnage estimates nor costs.

At the time of his report (1908 I believe) he estimated 75,000 tons in sight. This is a very irregular deposit of oxidized ore in lime and difficult to measure. Smith's method I quote you from his report.

"For purposes of estimating tonnage the writer has taken 500 feet east and west, 240 feet north and south and 75 feet vertically, which has been proven by present development work, and estimating twelve cubic feet to the ton gives 750,000 tons, which it is believed will run at least 10% ore, giving 75,000 tons blocked out" (I think you will find copy of the full report in your files.)

This is an unusual method of estimating tonnage, but in this case I am not at all sure it is not as fair and accurate a method as any other. My own rough estimates do not show so much ore, as is later explained, and I suggest that any examination or estimate made by our engineers be made on an entirely different system, both as a measure of safety and as throwing light on the value of Smith's ground percentage method.

Mahoney Brothers claim there is twice as much ore in sight now as there was when Smith examined it. The Manager (whom I met afterward in Good Springs) admitted to me quietly that this is not so and that there is less than 100,000 tons in sight according to his calculations. He is himself a stockholder in the Company.

I do not believe there is now more than 60,000 to 70,000 tons of ore available in the mine. This of course is only a rough estimate and not based on measurements and samples.

Smith gives the assay of this ore as about 35% zinc and 7% lead. Such ore cannot be shipped at a profit under present conditions with spelter much under $6.00 and the margin is small anyway. Present prices in Leadville for similar ore are:

$10.75 f. o. b. Kansas for 30% zinc carbonate.
$ 1.00 Assay variation.
$ 0.05 Spelter variation.
5% Lead free, $0.50 for excess.

The Potosi ore would thus bring $19.75 per ton at the mine.

Costs:-	Mining	$4.00	
	Hauling	5.00	
	Freight	8.00	17.00
	Margin.....		$ 2.75

The present management is therefore passing by most of this mixed ore and mining those portions of the ore bodies which contain higher zinc and lower lead, leaving the mixed ore standing for the future. Under this system their mining cost is at least $7.00 per ton of ore shipped, arrived at as follows:

There were seven men working, and they get out seven tons of shipping ore daily (after careful hand sorting).

7 men @ $3.00	$21.00
Supplies	10.00
Superintendent	10.00
Part of stable and blacksmith	5.00
Miscellaneous	3.00
	$49.00

Or $7.00 pre ton of ore shipped. It will be more than this rather than less.

About one ton of waste and low grade material was being mined for each ton of ore shipped.

The ore ground is soft and but little powder is used. By doing some dead work and filling some old stopes with waste the cost might be cut to $5.00, but no $2.00 or $3.00 cost can be reached so long as sorting remains such a close proposition and mining faces must be so carefully selected and handled.

Their total costs today must be at least as great as the following:

Mining	$ 7.00
Hauling	5.00
Freight	8.00
	$20.00

In his report Smith recommends gasoline traction engines on the road to Arden. These were tried last winter and have been abandoned. I do not know the real reason. Mahoney Brothers are Railroad Contractors, and finding business dull are using their own mules on this haul to Arden. They claim a cost of $4.00 per ton, but this includes nothing for cost or rental of the animals and wagons.

They are mining and sorting this ore to go 40% zinc. Following is a list of shipments made during March, April, May and June of this year:

POTOSI ZINC MINE. GOOD SPRINGS, NEVADA.

SHEET NO. 3.

DATE August 28th, 1911. INFORMATION SHEET FROM W. G. SWART COLLECTION SHEET NO. 194.

Lot.	Date 1911	Spelter	Weight	Assay Zinc.	Price Per Ton.	Total.	Ozs Ag.	% Pb.	% Ins.	% S.	% Fe.
11	3-29	$5.48	51416	37.68	$22.62	$355.23	4.1	4.8	5.1	1.0	0.5
12	3-29	5.402	57260	37.375	21.885	376.94	4.2	5.0	7.0	0.7	0.6
13	4-1	5.402	52752	34.54	19.06	325.25	3.6	3.1	9.2	0.9	0.4
14	4-7	5.402	52032	38.085	22.595	361.89	4.2	5.3	6.4	0.7	0.5
15	4-10	5.402	59764	36.72	21.23	377.21	3.4	4.2	8.2	0.8	0.5
16	4-11	5.3625	76284	39.46	23.773	582.06	3.8	5.8	8.8	0.5	0.5
17	4-14	5.3625	81248	39.325	23.638	612.34	3.1	2.5	14.0	0.5	0.5
18	4-19	5.2729	87650	38.72	22.585	614.78	2.6	2.1	12.0	0.4	0.4
19	4-25	5.25	85080	36.02	19.77	478.95	1.7	1.0	19.0	0.6	0.5
20	5-2	5.25	82694	38.195	21.945	552.04	3.5	5.7	11.0	0.4	0.4
21	5-5	5.25	81492	42.32	26.07	713.91	2.3	3.1	7.4	0.4	0.4
22	5-17	5.25	83268	42.515	26.265	736.39	3.2	4.8	5.6	0.4	0.2
23	5-17	5.227	85292	41.605	25.24	713.78	3.6	5.4	5.8	0.3	0.2
24	5-25	5.212	82586	40.675	24.235	648.53	2.8	4.1	6.2	0.3	0.2
25	6-1	5.1875	89468	37.775	21.22	569.41	4.3	7.3	7.0	0.8	0.1
26	6-5	5.1875	86148	37.93	21.37	556.72	3.8	7.0	6.3	0.6	0.3
27	6-17	5.1875	82276	40.095	23.54	616.23	3.15	4.6	6.2	0.3	0.3
28	6-20	5.20	85046	42.055	25.56	725.68	2.5	1.6	3.3	0.2	0.2
29	6-27	5.2458	87458	41.96	25.69	755.51	2.8	3.0	3.6	0.3	0.2
	Totals		1459014			$10,672.85					
	Freight		729.507 tons @ $8.00			5,836.06					
						$16,508.91					
	Average			38.15	$22.63		3.3	4.2	8.0	0.5	0.4

Note that later shipments average higher than those made earlier in the year.
Also note that spelter was dropping steadily.

No lime analyses given.

The shipments were made to the New Jersey Zinc Company, in Kansas. The contract price is
$22.50 f. o. b. Kansas for 35% zinc.
$ 6.00 Spelter.
$ 1.00 Assay variation.
$ 0.05 Spelter variation.
Engineering & Mining Journal Quotations.
No penalties, or at least none were charged on the statements.

Mr. W. E. Smith told Mr. Kimball and me in Flatteville that the lead exists in the form of galena, which it should be possible to separate from the zinc carbonate in a mill (jigs and tables). In his report he states that it is an oxidized ore. The truth lies between the two. The lead exists both as carbonate and sulphide. The possibility of successfully milling such ore is still an unknown quantity. Mr. J. F. Kent, Manager and chief owner of the Yellow Pine Mine, in the same district, has from 75,000 to 90,000 tons of this mixed ore and has recently built a mill to handle it.

This mill started operations while we were there, using the Overstrom system of classification and tables. Mr. Overstrom himself started the plant, altho' he did not design it. It is very poorly designed and built and in my opinion cannot succeed. The Overstrom classifier looks like a good thing to keep close track of. I can't see any marked advantage in his tables except lightness and ease of adjustment.

Under the circumstances, I do not feel justified in saying that these Good Springs ores can be successfully milled. It has not yet been done, altho' I should not want to say it is hopeless until it has had proper trial. Smith, while estimating large profits to the mine from milling, and even giving the figures in the early part of his report, still brings out in the concluding paragraphs of his report several good reasons why a wet mill is not going to make a close saving. It must be taken into consideration however that Smith is much more familiar with Wisconsin and Missouri coarse milling than with modern methods of concentration of fines.

In view of Mr. Kimball's recent letter with reference to the Pape process, this Potosi mine might have a very considerable value to us, especially if we also get the Yellow Pine and some of the other mines in the Good Springs district. The district is large and pretty well mineralized. Most of the ore being of this same general character. The failure of the Yellow Pine mill is going to hurt the entire district of course, and it looks like a promising time to get hold of the best properties. I shall shortly send you information sheets on the several properties which I have looked over in the district, and when I get East will go over the whole situation in detail.

In a general way I judge this Potosi property has 60,000 to 70,000 tons available. It is not right to call it all ore in sight, yet it is reasonable to assume it as almost a certainty. Disbrow will check this up for us at once.

In addition to this , I agree with Mr. Smith that the chances for large additional tonnage to the South and vertically above the present workings are decidedly good. There is much more uncertainty about ore being found beneath the shales and to the East of the East fault.

So far as surface indications go, there is not much to be said except that all over the district the surface indications are meager. The best and largest ore bodies have shown little indication of their presence on the surface. The unprospected Potosi ground is as promising as any I saw.

I have sent you copies of Mahoney Brother's letters offering the property at $225,000. You will note too that this is not their real price, since they ask us, after examination to make them an offer.

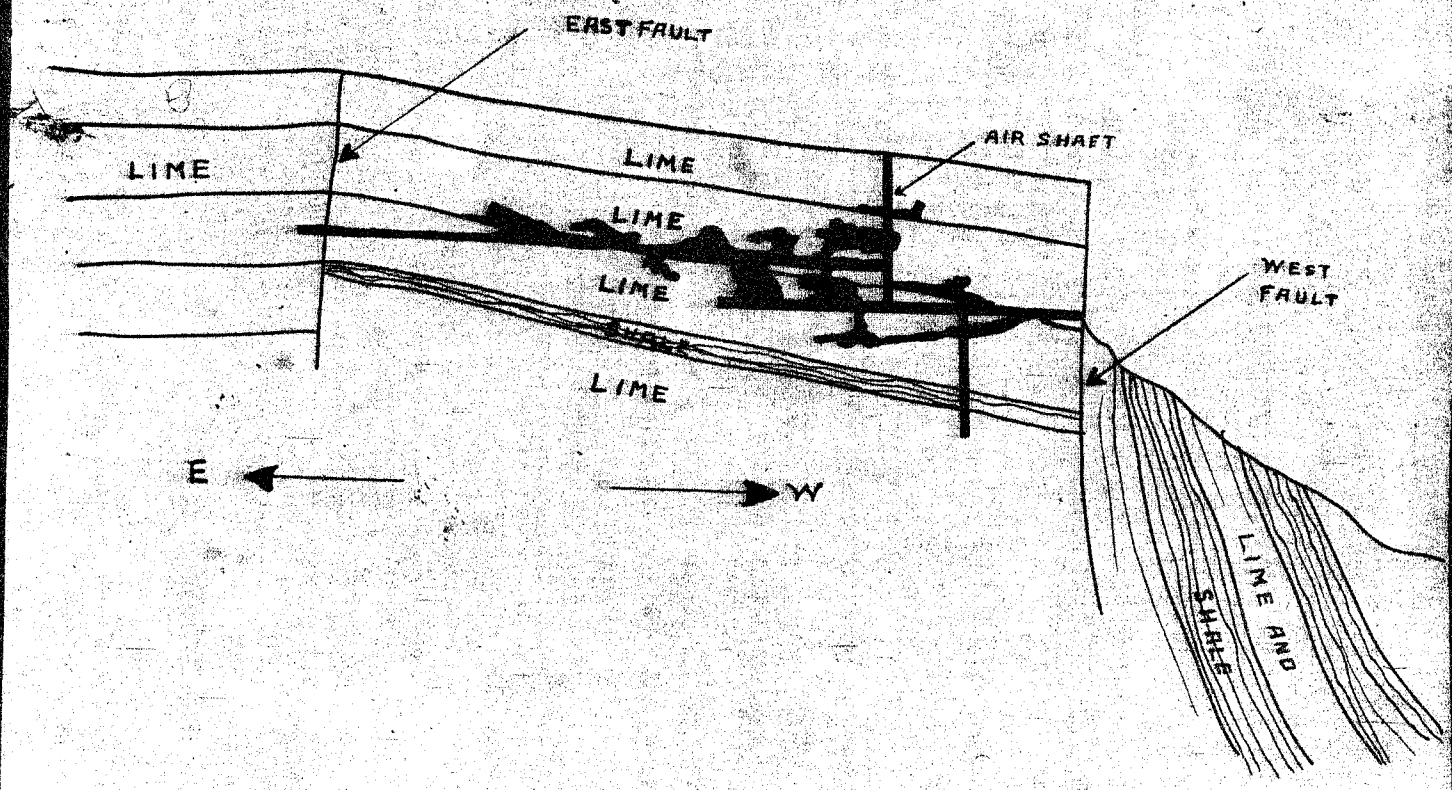
This game is worth chasing to a finish provided Disbrow's sampling and measurements check up our estimates.

W. G. Swart.

POTOSI ZINC MINE. GOOD SPRINGS, NEVADA.

August 28th, 1911. Information Sheet. No. 194.

Rough sketch of geology and ore occurence. July 1st, 1911.



Ideal cross section on East and West line looking South.

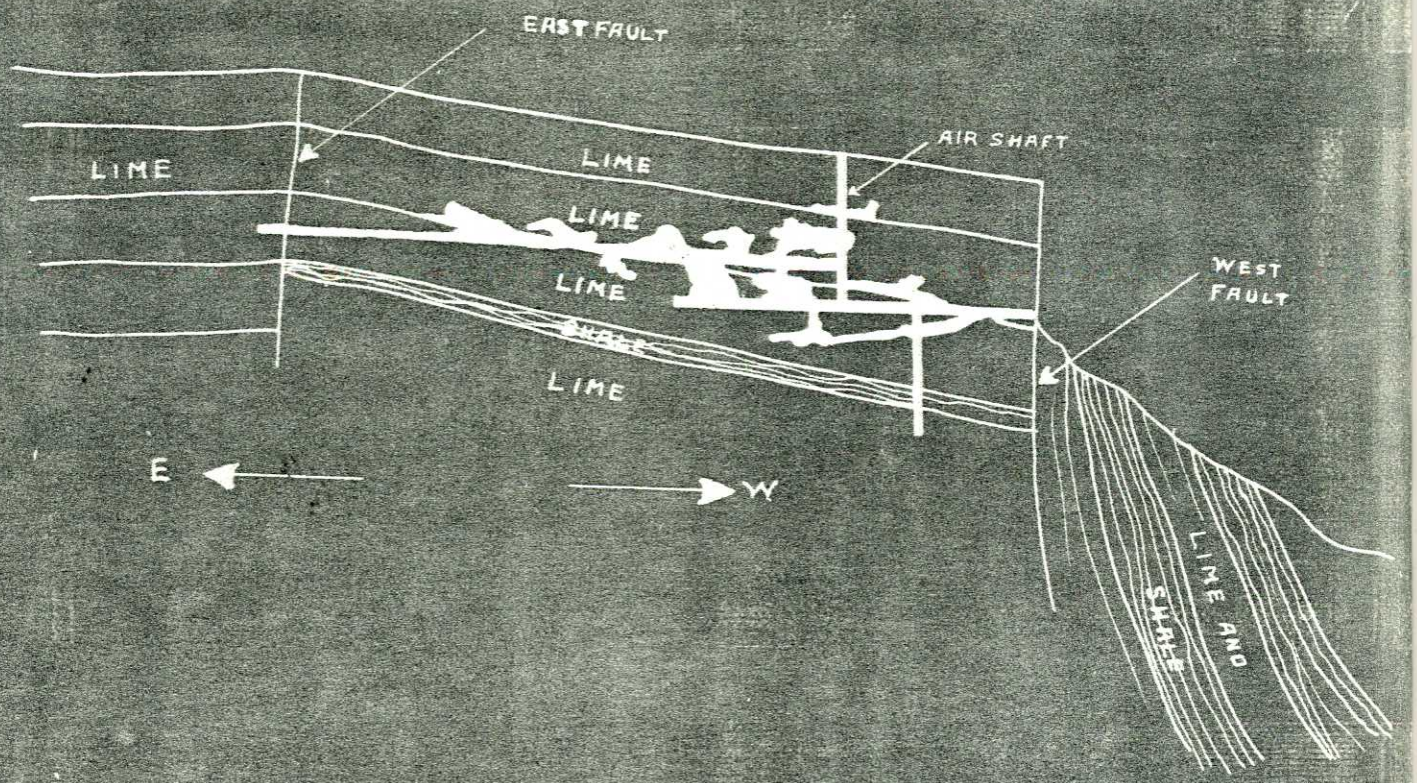
No attempt is made to accurately show the placing or extent of the ore bodies.

Not to scale---simply a sketch.

POTOSI ZINC MINE. GOOD SPRINGS, NEVADA.

August 28th, 1911. Information Sheet. No. 194.

Rough sketch of geology and ore occurence. July 1st, 1911.



Ideal cross section on East and West line looking South.

No attempt is made to accurately show the placing or extent of the ore bodies.

Not to scale---simply a sketch.

Item 78

E. JOHNSTON & CO.
MINES
[illegible]
LOS ANGELES, CAL.
[illegible]

LOS ANGELES, CAL. April 24th, 1909.

Mr. W. G. Swart,

Denver,

Colorado.

Dear Sir:--

Replying to yours of April 20th will say that, I feel under obligations to you for giving me a pointer as to the business methods of the owners of Potosi property. The Vice President Dew declared to me that the property had not been presented to any operators, and that the Company could deliver it promptly, and a lot of other representations that I now suspect is hot air, however as we have no time to waste on such things. I wash my hands of the whole matter and return their reports and maps at once.

Referring to the Zambrenwa and Jesus Maria I wish to reiterate exactly what I stated in my last letter to you as to the present condition of these mines. Would also say (which was forgotten in my last), that the lowest estimate for building a road from the present nearest Railroad point Tephuannes, to the mines, would be not less than $100,000.00 Gold, that is a road fit to haul machinery and supplies in and ore out, and of course the maintinance of same would mean quite a sum per annum. Any information that you have had about that property that don't coincide with what I have told you is incorrect, what I have told you are absolute

J. E. JOHNSTON & CO.
MINES
201 BRADBURY BLDG.
THIRD AND BROADWAY
LOS ANGELES, CAL.

LOS ANGELES, CAL.

fact, as I have said the property is a possible and very probable large valuable mine, but its inaccessability makes it undesirable to a great many big concerns.

The same property under the identical same condition would be operating, but in Mexico there seems to appear almost unsurmountable obstacles, to sum the whole thing up in a nutshell, it is a tremendous body of known ore, in an isolated and remote, and inaccessible region, of the average value of say $20.00 Gold value per ton, which would require capitalization of $2,000,000.00 to put on a dividend paying basis, roughly speaking, but if you receive advices from Boston urging you to go on with an examination I will immediately call off the Jeffries deal for 90 days, as it will be near that time when he can again get on the property from latest advices, in the new deal for Jeffry I am fighting for a reduction of $150,000.00 on the combined prices of both properties, and I know I will get it so that would make the gross $1,200,000.00 with long term for final payment to be made probably five years.

If you take the matter up those are about the prices and terms you will get, any worse than this would be a crime considering the situation.

J. E. JOHNSTON & CO
MINES
201 BRADBURY BLDG.
THIRD AND BROADWAY
LOS ANGELES, CAL.
PHONES { HOME A-1208
SUNSET MAIN 2544
CABLE ADDRESS—OHNS

LOS ANGELES, CAL.

The liquidations of Mr. Modesto's Lead property you will have digested by this time. I forgot to enclose the little description he wrote for me in the office when he called on me, after giving me a verbal description of what he had in sight as he knows nothing about mining property himself, he could not do justice and told me to go and make my own report before presenting it to anyone. This mans word you can rely on, and as soon as I hear if you would be interested will go and look the thing over.

In my next hope to send you particulars of the Paduca property, and also some information on a Zinc property in Neuve Leon, Mexico, and it is a good one if the owners have quit quarreling I will get it, had an order from Wiltsee of New York for a big gold property today, believe I have one that will suit him, it is big but almost undeveloped in New Mexico.

Waiting to hear from you in regard to Lead silver, with kind regards of Burke, and myself, I am,

Yours truly,

Johnston

Item 78

To Mr. H. S. Kimball
re: Pots - Advertising - Terry

Denver, Colo., April 21, 19 9.

Mr. H. S. Kimball,
86 Congress St.,
Boston, Mass.

My dear Kimball:-

Don't forget that no decision has yet been made as to the advertising cards nor as to the pamphlets. I am badly in need of advertising matter and we are losing business every day by not having proper material to send out to inquiring operators.

I have just received a letter from Los Angeles offering me an option on the Potosi mine in Nevada, the price being $750,000.

There is said to be a report made by F. E. King, another by Edwin H. Clark, another by F. N. Chandler and still another by E. H. Emmanual of Tombstone, Ariz. They all claim upward of 100,000 tons that will average 50% zinc, 10% lead and 10 oz. silver and some gold. The reports actually claim 215,000 tons of this ore blocked out or available. I am going to try to see the New Jersey Zinc Co. again and see if I can get at some inside information from them.

I am hoping to hear from you by wire that you will be here shortly. Judge Terry is going back to Silverton tonight. I have promised to let him know as soon as I hear from you with probable date of your arrival.

Yours very truly,

The ore is not a sulphide, but a carbonate, and there is no known way of making a clean separation between the lead and the zinc. Lots of people have tried to handle the ore, and furthermore, the mine is tied up in a three-cornered legal fight, or was when I was there.

My very kindest regards to yourself and to Mr. Burke. I shall hope to hear from you shortly on the Mexican mine near Puebuca. Shall also hope to hear from you with regard to zinc mines anywhere.

Very Truly

W. G. SWART

30
Item 78

J. E. JOHNSTON & CO.
MINES
201 BRADBURY BLDG.
THIRD AND BROADWAY
LOS ANGELES, CAL.
PHONES: HOME A-1063
SUNSET MAIN 3564
CABLE ADDRESS: JOHNS

File Under: J. E. Johnston & Co.
Subject: Potosi

LOS ANGELES, CAL. April 19th, 1909.

404

W. G. Swart, Esq.
Denver,
Colorado.

Dear Sir:—

Hoping that you have quite recovered I write to ask you if you have been on the Potosi Zinc Lead Silver Mine of the Yellow Pine District, Nevada, or if you have heard anything about it that would determine your people from being interested, if not and you advise me that if it is a good one you will look into it, I will immediately go and either verify or deny the glowing statements that have been made to me.

Have seen a combined report from F. E. King, Edwin H. Clark F. N. Chandler and also one from M. H. Emmanuel of Tombstone, Arizona They all claim upward of 100,000 tons that will average 30% Zinc, Lead 5% and 10 ounces Silver and some Gold. The reports actually claim 215,000 tons of this ore blocked out or available.

Perhaps you had better wire me what you think of this, as I do not want to make the trip and preliminary, unless I know that I have a customer for it, and you are the only one I have taken it up with until I heard from you. Have arranged for a four month option to be given to whom I shall designate, and have the contracts all signed.

Potosi Mine (Lincoln Co.) Goodsprings Dist. Clark County (30)

I tried to see this property in Feby 1909 but was prevented by storms. Tried again in May, 1909. Got as far as Jean but was sent by Mr Coolidge to Silver City N.M.

Item 78

Feby 3, 1909 W.N. Smith of Platteville, Wis. reported on the property for David L. Fairchild of Duluth, Minn. This mine was brought to Kimball's notice by Smith and Kimball met Fairchild. In Sept. 1909 Kimball & I talked it over with P.G. Gray of Boston.

Smith gives following facts:

Potosi Zinc Co. (Successor to Potosi Zinc-Lead M. Co.) organized in Nevada. $2,000,000. $1 par. Issued - $1,225,000.00. Treasury 775,000.00

30 miles S.W. of Las Vegas. 20 miles W of Arden.
Due on purchase price ($62,000) -- $50,000.
Other indebtedness, Feb. 1909 51,882.51
$101,882.51

1st Co. sold $234,684.44 of Zn ore (gross ?)
15,119.61 " Pb
$249,804.05

Average value of Zinc (price per ton) = $21.945
" " Costs = 18.59
(Carbonate) profit = 3.355

Costs -	
Mining	3.25
Hauling	5.00
Freight	10.00
Sampling	.25
Assaying	.09
	18.59

Average Assay Zn = 35.72
Pb = 7.00
Ag = 3.875

" Spelter price St Louis, 6¢ in 1906 & 1907

" Assay of lead ore Pb = 60.84
(Carb. & sulphide) Ag = 10.27 (Hand Sorted)
Zn = 9.46

Second Co. in 1908 shipped 1179 tons & lost $4.04 per ton.
Costs $16.80. Spelter $4.75
Average Assay Zn. 33.82

14 claims, 1 patented. 6 mill sites 2 timber claims.
Plant requirement $10,000.
Ore blocked out - 75,000 tons. as follows
Zinc - 71,250 tons. Zn 35.00 Pb 10.00
Lead - 3,750 " Pb - 60.00 Ag 10.00 oz

Smith figures costs at $12. leaving net profit Zn $262,100 without mill
" " Pb 73,800
" total " $335,900
" " profits with mill at $734,240 or one in eight

In Paleozoic lime. Ore in definite sheets in shaly portion
He says (page 11) "ore is entirely an oxidized product" He told Kimball & me the lead is galena.
Recommends closer drilling
Very little water
See report

(Lord Springs)

Potosi Zinc Co

W. N. Smith says Feb. 3, 1909 that P. G. Gray then Pres of Co stated capital stock 2,000,000 of which $1,220,000 issued.

There was an indebtedness then of $101,882.51 (to Mahoney Bros probably)

A lawsuit followed in which ~~the~~ W. E. Smith Supt of Mine recently said the mine reverted to Mahoney Bros "who can furnish abstract of title"

Mr Shubee thinks capitalization represents value of mine he wants $120,000.

Potosi Zinc Co

Cap $2,000,000 Par $1.00

(30)
Item 78

August 7, 1916.

404

Mr. W. H. Smith,

Platteville, Wisconsin.

My dear Smith:-

Replying to yours of July 28th, will say that we have as yet discovered no means of handling your flue dust. My best guess is that a series of classifiers and Wilfley Tables will do you more good than anything else.

With very kindest regards, I am,

Yours very truly,

AMP/N

NATIONAL ZINC SEPARATING COMPANY

(30)

Item 78

PLATTEVILLE, WIS.

July the 28th, 1916

Mr A M Plumb,

American Zinc Ore Separating Co.,

Denver, C o l o r a d o.

404

Dear Plumb:---

In 1914 I believe, we had a little correspondence with you in reference to the use of your pneumatic jig in treating flue dust and similar products produced in the Mathey roasters.

This Summer we installed a dust collecting system for removing the dust which escaped all over the separating rooms from the separating machines, feed spouts, etc. This dust is carried out of the plant by means of a large fan, and blown into a rectangular stack. A considerable part of it settles in the stack and drops to the bottom. This material carries, as you know, a very considerable amount of zinc.

Do you think that your pneumatic jig would separate the zinc from this material, as well as from the stack dust? We would be glad to consider the installation of your jigs if they would do this work for us.

Very truly yours,

NATIONAL ZINC SEPARATING CO.

W N Smith

MANAGER.

WNS-S

(30)
Item 78

AMERICAN ZINC, LEAD AND SMELTING COMPANY

H. S. KIMBALL,
PRESIDENT

1009 PIERCE BUILDING
ST LOUIS, MO.

Sept. 19, 1912.

SEP 23 1912

H 04

Mr. W. G. Swart,

Denver, Colo.

My dear Swart:-

I am sending you enclosed letter and report received from Polhemus, in which you will note the Potosi property in Nevada, is back to us again in a little different shape. Will you please look over the report and make a brief synopsis of it on Information Sheet, sending me copy and one to Dick Polhemus.

Am sending this to you as their may be some new developments since Disbrow's report and examination. I note that Abbott is taking the same means of estimating tonnage that W. H. Smith did originally, i.e., taking the length and width and depth of ore deposit, and dividing by certain percentage, in order to get the available tonnage of concentrates. I think we have always agreed that this is not the way to size up the ore body in this property. Tonnage secured in this manner is so much above that reported by Disbrow, that there is nothing in it.

Soon as you have made synopsis of the report, kindly send the report to H. S. Abbott, c/o G. G. Fowler #114 Russ Building, San Francisco. Abbott asks to have this report returned to him soon as possible.

No!

Return to JHP at Carthage, Mo.

Yours very truly,

H. S. Kimball

Potosi Mine, Good Springs, Clark Co., Nev.

Date Oct. 22 1912. Information Sheet From W. G. Swart, Denver. Sheet No. 409

404

"The following report is made by Mahoney Brothers, (San Francisco - the owners) from our knowledge of the mine, from data in our possession, smelting returns, different assays, and reports, statements and suggestions made by mining engineers and smelter men."

In other words it is sort of a composite report. At the end they give a long list of individual shipments from the property. This I have omitted, copying the report otherwise in full for our files.

W. G. Swart.

San Francisco, Calif., Jan.31 1910.

POTOSI MINING GROUP.

This group consists of fourteen claims and six millsites and two timber claims, and is situated in the Yellow Pine Mining District,(Section 1-12-13, Township 23 S., Range 57 E.) Clark County, Nevada, 20 miles westerly from Arden, a station on the S.P.L.A. & Salt Lake Railroad.

OPERATION

Mahoney Brothers operated the mine from about March 1905 to Jan. 1 1906. During the first two or three months of this time roads were built into the mine, camp erected, cableway and equipment were put in place. About 2000 tons of ore was shipped, of which 500 tons was lead ore, average assay about sixty per cent, and 1500 tons was zinc ore, average assay about forty-three per cent. In hauling the zinc ore a crude roaster was installed and zinc ores were roasted with the intention of driving off the carbon and ridding the ore of moisture. Returns from the smelter on some carloads of the roasted ore were as high as fifty-two per cent zinc, and it is the opinion of the writer that if suitable equipment for roasting the ore is installed it would greatly increase the value of all ore shipped.

TITE

Potosi Zinc Lead Company, 1-1/2 yrs. Jan. 1906 to July 1907.

SALES

Potosi Zinc Lead Company (Jan. 1906 to July 1907.)

The following is taken from smelting returns:

Zinc	10,829 tons (dry wt.)	$235,684.44	(value)
Lead	231	15,119.61	
	11,060	$250,804.05	

#Lead practically 3% to total tonnage.

Zinc. Av. price per ton $21.945 Cost.

.09	assay
3.35	mining
5.	hauling
10.	freight
.25	sampling
18.59	

Av. cost (Est) " " 18.59

Av. Profit " " 3.355

Av. assay Zinc. 35.72% -- Lead 7% -- Silver 3.875 (Oz per ton)
Av. price spelter during time of shipment $6.00, St. Louis.

Lead --Av. price per ton	$45.25
Av. cost " "	8.25
Av. profit " "	$37.00

*Freight, sampling, assay, etc., allowed for in net price received.

Av. assay- Lead 60.84 --- Silver 10.27 (oz per ton) Zinc 9.46.

Mahoney Bros. operated the mine from June 1909, to the present time. The following are smelting returns and assays of different shipments-

Car no.	Gross Pounds	Moisture	Net Pounds	Net val per ton	Total Value	Freight Deducted	Net Value	Contents
L.A. 11,086	88,387	1.	29,280	$42.73	$1886.39	$267.83	$1620.55	Lead
" 62,190	78,600	1.8	77,186	26.30	1014.98	314.40	700.58	Zinc
M.P. 20,144	71,580	2.5	69,790	24.96	870.98	287.32	583.66	"
" 95,383	65,100	2.2	63,668	25.26	804.13	261.40	542.73	"
" 98,898	75,870	3.5	73,215	27.49	1006.34	304.48	701.86	"
" 81,980	76,300	3.2	73,858	28.56	1054.69	306.20	748.49	"
" 62,183	81,930	2.5	79,882	28.65	1144.31	328.72	815.59	"
" 61,748	54,860							
" 11,047	26,140	5.1	76,969	22.02	846.33	243.[illegible]0	598.42	"

The following are assays made by the George A. James Company from samples on above carloads:

											Percentages.
Car 62190 -	Gold	.026 oz:	Silver	2.98	oz.	Ton	Lead	6.50%	Zinc	39.19%
" 95383	Val	$1.36	"	2.6	"	"	"	8. %	"	35.6
" 98898	"	1.78	"	3.4	"	"	"	5.6	"	39.5
" 20144	"	1.15	"	2.2	"	"	"	6.6	"	37.5
" 81980	"	2.18	"	4.3	"	"	"	4.9	"	40.1
" 11617	"	1.58	"	3.	"	"	"	6.3	"	41.2

The following is an assay return by the American Smelting and Refining Company on shipment of lead ore contained in car L.A. 11,086.

Silver 8.5 - Lead 70.9% - Silica 1% - Iron 2% - Zinc 4.5% - Sulphur 8.6%

TIMBER

There is an abundance of timber for fuel purposes, stulls, etc., also considerable large pine on part of the company's claims, 3 to 4 feet on the stump and 40 to 50 feet high, to be had.

WATER

At the camp there is nearly an inch of excellent water flowing which is practically free from Calcium Salts or Alkalies. A mile and a half N.E. from the camp considerable water could be obtained and piped to the camp if found necessary.

ASSETS: CAMP

The camp has an altitude of 5800' and consists of the following described buildings:

1 - Bunk House ---------- 12 x 42 ft.
1 " " ---------- 18 x 42 "
1 - Boarding House ---------- 16 x 50 "
1 Managers " ---------- 18 x 24 "
1 Supt. " ---------- 12 x 12 "
1 Office ---------- 18 x 24 "
1 Assay Office ---------- 12 x 15 "
1 Stable ---------- 18 x 35

The assay office is well equipped and stocked with supplies.

ASSETS

Claims - mining - 14 (1 patented - 13 assessment work done; $30 to patent each claim)

Millsites 6
Timber 2
Plant and equipment $10,000.

Mine Blocked out ----------112,500 tons.
Zinc 106,875 tons - Assay 35% Zinc - 10% Lead.
Lead 5,625 " " 60% Lead - 10 oz Silver.
112,500 "

* in past high lead ore avoided.

Shipping produce and value - Without concentrating Mill

112,500 tons 80% recovery (that is 20% lost in hauling)
90,000 " Zinc 87,300 tons: lead (3%) 2700 tons.
Zinc 87,300 " (price) - $22.50 - Value $1,964,200.

Assay - Zinc 35%
Lead 6-7%
Spelter - $6 St. Louis

*Note: In this est. it is assumed that the grade of ore which would be recovered in practically the same as that shipped in the past, and the price is figured on a $6 spelter basis.

(Forward) $1,964,200.00

Costs Mining $2.00
Hauling 2.00
Freight 8.00
12.00 1,047,600.00
Net profit $ 916,600.00 $ 916,600.00

Lead 2700 tons price $45.00 Value 121,500.00
Assay Lead - 60% Silver 10 oz.
Costs Mining $2.00
Hauling 2.00
$4.00..... 10,800.00 ($110,700.00)
Net profit on both zinc and lead---------$1,027,300.00

*Freight etc. allowed for in price per ton of lead ore.

Shipping Product and Value - With Concentrating Mill.

In the following estimates of recovery and possible profits with a concentrating mill, the figures are not based on the known work of any definite type of concentrating adapted to this ore, but are based on general principles of concentration, and are believed to be an approximation of the costs and of the results which could be obtained with a concentrator.

(1) Dump from old Mahoney lead workings.
assay
3500 tons ..... 26.81% Zinc
21.21% Lead

(2) Mine dirt.

112,500 tons ----------80% recovery
90,000 " (There would be 15,000 tons on waste dump, run 10% zinc; possibly, would be treated in mill, but not considered in estimate.)

Note- If mill erected, would work a higher per cent of lead in ore, that is would recover 5% of total tonnage as coarse lead and fines should run 10% lead.

ORE RECOVERY

(1) 2500 tons - (Old Mahoney dump) -26.81% Zinc; 21.21% Lead -
3500 x 26.81% Zinc - 938.35 tons Zinc -2345 tons 40% Zinc ore.
3500 x 21.21% Lead - 742.35 " Lead 990 " 75% Lead "
2345 tons x 80% recovery 1876 tons 40% Zinc ore recovered, (final product)

990 tons x 80% recovery 790 tons 75% Lead " "

(2) 90,000 tons (Mine dirt) - 5% coarse lead - 4500 tons 60% lead (final product)

57000 t. 35% Zinc -- " "

85,500 tons - 25% coarse Zinc- 21,375 tons 40% Zinc (fin.prod)
64,125 " 33-1/3% " - 10 lead.

64,125 tons 10% Lead 6412 T. 75% lead, 80% recovery-5130 tons (fin.prod)
57713T. 35% Zinc ore.

or

57,713 tons 35% Zinc 48,500 T. 40% Zinc 80% recovery 38800 tons (fin.prod)

Values.

Mahoney Dump	1875	tons	40% Zinc	@27.50.....	$ 51,562.50
	790	"	75% Lead	" 55.00	43,450.00
	4500	"	60% "	" 45.00	202,500.00
	21375	"	40% Zinc	" 27.50	587,812.50
	5130	"	75% Lead	" 55.00	282,150.00
	38800	"	40% Zinc	" 27.50	1,067,000.00
					$2,234,475.00

Costs Zinc Handling .50
Mill .50 $1.00 Lead
Hauling 2.00 2.00 "
Freight 8.00
$11.00 $3.00

COSTS

1875 x 11.00.....	$ 20,625.00
790 x 3.00.....	2,370.00
4500 x 4.00.....	18,000.00
21375 x 12.00.....	255,500.00
5130 x 4.50.....	23,085.00
38800 x 12.50.....	485,000.00
	$ 804,580.00
Profit with mill	$1,429,895.00
" without "	1,027,300.00

GEOLOGY

The ores occur in limestones and are very irregular both in strike, dip and mass, being of the Chamber deposit type; although no doubt, having an origin similar to that of fissure veins, but

the complex fissuring of the limestone afforded channels for the infiltrating mineral waters which formed the chambers and deposited the ore in various directions and dimensions. We believe that the spring at the camp has some connection with these, or the limestone will be found intrusions of Porphyry, Shales and possibly altered Sandstones, otherwise the spring would not be so free of Alkalies and Calcium Salts.

MINE WORKINGS.

The main workings are about 1000 ft above the Camp and consist of two tunnels known as the North and South Tunnel Levels. The North Tunnel is not used at the present time for extracting ores, but still has a lot of available ore which could be easily extracted. The South Level and its connections are the main workings today. The equipment outside consists of an ore bin, chute and assorting platform near the entrance of the tunnels, a rail tract about 2000 ft. to an ore bin where an aerial tram 1800 ft long delivers the ore to a bin and chute convenient for loading the ore into the wagons, the aerial tram can handle 50 tons in 8 hrs.

DESCRIPTIONS.

The main tunnel level was sampled every 5 ft for the first 90 ft. the ore was of various dimensions in the roof, on the sides and in the floor, many places it was partially stoped, the average thickness for this distance was 2 ft 2 in. which assayed:

Zinc 28.6% Lead 6.86%

The next 100 ft. was sampled every 10 ft. The ore occuring in the sides, floor and roof in irregular form being partially stoped and in places under and stoped along the sides, the average thickness of ore for the whole 100 ft. takenat these intervals of 10 ft. was 1 ft. 4 in. There were places along this distance were the showing was very promising for making good chambers of ore, samples assayed: Zinc 28.8% Trace Copper 4.6% Lead.

The next 100 ft. the ore occured in a similar manner, the intervals of 10 ft. only shows an average width of ore for the whole distance of 76 ft. but the ground was partially stoped although, in several places, there are bunches of ore from 3 ft. to 6 ft. in the roof. The samples assayed:

Zinc 33.5% Lead 1.4%

The next 100 ft. of the tunnel sampled showed the ore to occur in the same manner as those before except, that the ore has gone into the floor of the drift: a winze sank 40 ft on the N.S. in this block of the tunnel shows about 15 ft. of ore below the collar or floor of tunnel. With this exception very little ore is shown in this distance. Samples taken assayed:

Zinc 33.3% Lead 1.47%.

The next 100 ft. was not sampled as the showing was too small the ore was largely in the floor or stoped out. The -. level turns off in this block of ground.

The next 100 ft. is where the gasoline Hoist is situated and those large stops shown in map, on the South side of Level, there are still quantities of ore in the pillars also in the sides of the

tunnel,, near the hoist the ore extends for 32 ft. 8 in. in roof but has been stoped over head. In the stoped ground, northeast of the hoist, is a winze showing good ore. The fact, all of the ore here seems to be going to the southwest. The 100 ft. shaft shows ore 10 ft. thick under the floor. The average thickness of ore sampled in this block of 100 ft. is 5 ft. for the whole distance. While much of it has been stoped out it shows that it is still in the floor and dips to the southeast. These samples assayed:

Zinc 26.5% Lead 15.87%

At the end of the main tunnel level there has been a large chamber of ore stoped and a winze sunk 50 ft. In the bottom of the winze is said to occur very hard Oxide of Zinc (Dry bone) also along the south side of the stoped ground occurs fine showing of zinc ore dipping to the southeast. I believe there will be found large bodies of ore to the deep near this place or south of it.

The 100 ft. level does not show much ore so I did not go down to see it, but I believe the ore goes over them and longer drifts to the south will catch it or an upraise to the workings above.

The tunnel to the north from the main tunnel level is in 194 ft. to the face, at which point they are just coming into some red ore. 102 ft. from the entrance of the drift is a bunch of ore 6 ft. 7 in. high by 7 ft. 8 in. wide occuring in the wall and is the only ore I saw in the whole distance of this level and its cross-cuts to the west, but this showing will no doubt, open into a large chamber of ore or connect with some of the showings in the upper level 40 ft. above to be described next. Samples of this ore exposed assayed:

Zinc 37.3% Lead 5.49%

UPPER LEVEL.

Begin ing at the air shaft in the upper level, shown on the map, which is 195 ft. to the surface, is drift No. 1 - 26 ft. from this point to a large stope, 28 ft long and 27 ft high, with large showings of good ore still in the roof and sides of the stoped ground, about 80 ft northwest from the stoped ground, is an upraise 25 ft. high, mostly in good zinc, Galena ore, which no doubt extends across this 80 ft and beyond and will yield a large tonnage of ore. A sample of 15 ft of this ore in face of the stope assayed:

Zinc 32.8% Lead 2.74%

A sample taken along both sides of No. 1 drift, 118 ft. to intersection with No. 2, drift and the cross-cuts to the North 33 ft. assayed:

Zinc 38.8% Copper trace. Lead 3.5%.

NO. 2. DRIFT.

105 ft. of this drift north of chute is practically barren of ore, also 44 ft. from No. 3 drift to stoped ground shows very little ore, but the space between chute and intersection of No. 3, drift 74 ft. is excellent ground and will yield a large tonnage. Samples assayed:

Zinc 15.2% Copper 4%

NOS. 3 and 4 DRIFTS.

No. 3 drift is 32 ft. long: No. 4 Drfit is 127 ft. long. Nos. 3 and 4 Drifts show fine bodies of ore especially along 3 and in the face of No. 4. These samples combined assayed:
Zinc 32.3% Copper Trace. Lead 5.88%

NO. 5 DRIFT.

In No. 5 level off from the stoped ground is 93 ft. long, the first 53 ft. does not show much ore, but at the intersection of No. 6 level north, there is a splendid showing from here to face of drift 43 ft. which will average 6 ft. of good ore, dipping at the face into the floor. Samples assayed:
Zinc 31.5% Lead 17.44%

NO. 6 DRIFT.

No. 6 drift is 124 ft. long. About five feet of ore at entrance of this drift, then 37 ft. of barren ground, the rest shows bunches of ore and zinc incrusted on the limestone in the small vugs, which, no doubt, will lead to important ore bodies near by, a sample taken of these showings assayed:

Zinc 36.6% Copper trace. Lead 2.15%

NO. 7 DRIFT.

No. 7 drift is 50 ft. long. In the face of this drift is a very good showing of spar carrying Galena and Zinc, with Copper stains. The whole face of the drift was in ore of this character, very similar to No. 6 drift, but showing less Galena. Samples assayed:
Zinc 33.8% Copper trace. Lead 1.47%

The Dump samples were very hard to obtain on account of the ore being covered with so much waste. As near as I could measure I would estimate the dump to contain 9856 tons. It is possible that there may be twice this amount although it cannot be seen. For the purpose of estimating value we have placed this quantity at 3500 tons. Samples assayed:
Zinc 26.81% Copper trace. Lead 21.21%

The ore with the exception of a little Zinc sulphide occuring in the Fault zone at the east end of the workings, is entirely an oxidized product, zinc carbonates, silicates and perhaps oxides. In color, the ore varies from pure white to dark gray and reddish iron stained ore.

In physical character, it varies from a fine powder through a soft porous crystalline mass, to a dense, hard crystalline ore. In shooting much of the soft phorous breaks up into fine material so that in the assorted product, which is shipped, the part which will pass through a half-inch grizzley is to the part which is coarser than this as 3 or 4 to 1.

In grade, the ore varies from the unaltered limestone as

the lower limits up to as high as 48% zinc. From the accompanying tables, it will be seen that a fair average of the entire 12,000 tons of zinc ore shipped is about 35% zinc, and this was obtained by means of the very crude method of hand sorting. So far, about 3% of the total tonnage shipped has been recovered as coarse lead ore, which will run about 60% lead and 10 ounces silver. Besides this coarse lead, the zinc ore shipped has averaged about 7% lead, which has been broken up too fine to be separated from the zinc by hand. As the method of cleaning the ore has been so crude, it has been necessary to largely avoid mining the places where the greatest amount of lead has occured, and therefore, the writer believes that if a satisfactory mechanical concentration can be employed, the lead (and consequently the silver) contents of the ore can be materially increased in mining.

For the purpose of estimating tonnage, the writer has taken 600 ft. east and west, 300 ft. north and south and 75 ft. vertically, which have been proven by present development work, and estimating 12 cubic feet to the ton gives 1,125,000 tons, which, it is believed will run at least 10% ore, giving 1,125,000 tons of ore blocked out.

In reference to additional tonnage, it is confidently believed that a very considerable amount of ore occurs in the area south of the tunnel level and west of the north-south fault plane, which occurs at the east end of the present workings. Wherever prospecting drifts or stopes have been driven south of the tunnel level very good ore is shown. How large additional tonnage can be developed here, is of course, simply a question of fact, by the development work this far has shown nothing to cut off the ore in this direction. As the country rock has a general dip to the south, it is probable that if an important extension of the ore body is determined to the south of the present workings, it will be necessary to mine same from a lower tunnel level, or from a vertical shaft extending to a lower level.

Vertically, it is also simply a question of fact as to the height to which the ore body will extend. It must be remembered that this is a new zinc district, that it has its own peculiar characteristics, and that nowhere has a large body been worked sufficiently to lay down general principles such as can be done in many of the older zinc districts.

A close study of the accompanying map will show that ore zone dips to the south and I believe goes to the deep.

The proposition has a great deal of merit, but needs considerable capital to open up the lower levels when large chambers of sulphides are apt to be found as already indicated by a few specimens of Sphalerite found in the lower levels.

In regard to the assays they were taken across the deposits as found and contain the waste which will have to be assorted out to bring the ore up to the shipping grade, of 46 to 50%. The average samples being about 30% zinc shows that when the ore occurs it is fairly clean. A little over 1/3 being waste.

The probable ore at present exposed by the workings ought to be extracted and assorted for $2 per ton, as there are so many places where men can be put to work on ore. With proper machine drills and equipment this could be greatly reduced.

In reference to prospecting and possible extensions of the present ore bodies, as well as the additional property of the Potosi Mine Group the writer believes that this could be most economically done of means of church drilling. On none of the other claims, was there any considerable showing of zinc at the surface although in a number of places, some zinc is found. On none of the claims was the surface showing as strong as that on the face of the mountain where the present tunnels have been driven. However, there is opportunity for considerable more surface prospecting on all the claims, and it is also possible that, even where the surface showing is not strong, a body of ore may be developed by following into the mountain. Throughout the "Good Spring District" zinc occurs frequently, but at the present time, only two properties besides the Potosi, have been developed into shippers of zinc ore, these are the Monte Cristo and the Kent, from neither of which, however, in a large tonnage yet produced.

RAILROAD TRANSPORTATION AND WAGON HAUL.

Thus far, it has been necessary to haul ore by teams and wagons to ARDEN STATION, on the S.P.L.A.& S.L.R.R., a distance of 20 miles. From Arden it has been shipped to Kansas smelters, the freight charge being $10 per ton at first, and at present $8 per ton. The only possible, although not at present practicable, competing shipping point at present is Ivanpohon, the S.T.& S.F.R.R., a distance of about 36 miles south of the mine. However, the country between Ivanpohon and the Potosi Mine is being gradually settled and, locally, it is hopefully believed that the Santa Fe will, in the near future, extend the line to Pandy, about 10 miles south of the Mine. If this should be done, it would be a great benefit to the property, not only in affording a possible competing shipping point, but in giving a very much easier haul of the ore to the railroad, or even of running a spur track to the Mine.

The present haul to the railroad has been done by teams at a contract price of $5 per ton. This cost, in itself, almost makes profitable mining impossible. However, the writer would feel very confident that, by substitution of gasoline traction engine haulage, in the place of teams, this cost would be reduced to $1.50 and $2 per ton. The wagon road the entire distance from Arden to the mine has an excellent roadbed, hard gravel with very little sand. In going out of the mine loaded there is first about 2 miles of uphill pulling: the steepest grade, however being 5%. The four steepest grades on this part of the road were measured, giving 3.7%, 4.7%, 6.3% and 10%. Of course, these grades only effect the light haul into the mine. Immediately at the foot of the mountain, the present road goes over a small hill on a 10.40% grade. From this point to Arden, a distance of 14 miles, it is a uniform, gradual descent. There

is no question but that with very little expense all grades over 8% can be eliminated, and from a hasty examination it appeared that the route over the small hill at the foot of the mountain (which gives the greatest grade for loads going out), could be abandoned and the road kept on a continuous grade downward from the summit to the railroad.

SUGGESTIONS FOR FURTHER WORK

To us, it appears that there are three essentials to be worked out in order to assure a more profitable operation of this property - (1) Reduce the cost of hauling - (2) Reduce the cost of mining and (3) Effect a better separation of the lead and zinc and, possibly lime.

(1) Hauling: It is believed that until such time as it may be practicable to have a railroad spur direct to the property (if shipping on the Santa Fe) or to the foot of the mountain (if shipping on the Salt Lake Railroad), the cost of hauling can be reduced from $5 per ton to $1.50 or $2 per ton, by gasoline traction haulage.

(2) Cost of Mining: From the best figures obtainable, the cost of mining has been between $2.25 and $2.50 per ton of ore shipped. By substituting large air hammer drills which could be operated by one man in place of hand steel work, by systematizing the underground work with a view of mining instead of development entirely, by supporting the ore on a travelling belt instead of the stationary platform now used, the cost of mining should be materially reduced. It is on the basis of these charges that the estimate of cost in the figures of possible profit are based.

It would take a comparatively small sum of money to install a small air compressor and about three air hammer drills and, also, to install a travelling picking belt. The air compressor could be driven from the gasoline hoisting engine which is now installed on the property. If this were done and a small crew of men were set to work, it would be possible within a short time, to demonstrate very closely what the cost of mining this ore body should be. If the results were satisfactory, the one would feel warranted in working the property on a larger scale and of making the more extensive improvements which might be necessary.

(3) Separation of Lead and Zinc and Possibly Lime.

The proportion of fines which is obtained in even the present system of hauling ore is so great, and the per cent of lead contained in the fines so high, that, if possible, these should be treated in some way to both bring up the percentage of zinc in the final product and to obtain, as a marketable product, the fine lead and accompanying silver values. It is believed that the ordinary wet methods of concentration will not be practicable in this case, for several reasons. In the first place, a large percentage of the ore, when broken by shooting or on a grizzley, goes into a fine powder, which in wet concentration would be carried off by the

waste water. Also, a considerable part of the ore, and particularly much of the highest grade white ore, breaks up into small, flat particles, which in spite of their high specific gravity would tend to float off in the waste water. A part of this could be recovered in settling tanks but these would have to be of large capacity and even then, it is believed that the losses would be high. Some forms of dry concentration would seem to be practicable method to employ. The writer has no definite process to recommend but would suggest that the Sutton-Steele pneumatic tables be looked into.

Another suggestion for handling the production of this and other properties in this vicinity is the possibility of a smelter for the production of spelter or a zinc oxide plant for the production of zinc white pigment. The practicability of this, however, can only be determined by the development of a sufficient ore supply and, also by an investigation of the commercial features on the Pacific Coast in reference to the fuel supply (the California Oil Fields) and the market for spelter or the Zinc White pigment.

ASSAY SAMPLES.

The following are copies of assays made by Mr. C.E.McCarthy.

Samples of fines and sorted ores taken daily for period from Oct. 6th 1908 to Oct. 20th 1908.

	Fines.	Sorted.
Oct. 6-	31.8%	38.9%
" 7-	28.5	35.8
" 8-	27.7	43.1
" 9-	35.4	39.8
" 10-	28.2	39.4
" 11-	35.6	40.1
" 12-	34.8	40.4
" 13-	33.2	38.4
" 14-	34.0	40.9
" 15-	31.8	39.4
" 16-	35.8	38.1
" 17-	34.1	38.2
" 18-	37.3	40.0
" 19-	30.3	40.2

General average for 19 lots by returns from Taylor and Brunton.
Samples - 34.06% Zinc

General average for the same 19 lots, by samples taken from wagons at mine.
Samples - 34.54% Zinc.

General average Lots 1, 2 and 3, by T. & B. returns,
35.58% Zinc.

General average Lots 1, 2 and 3, Wagon samples,
35.98% Zinc.

General Average		Lot	4 By T.& B. returns	37.83%	zinc
"	"	"	4 wagon samples	39.24%	"
"	"	"	5 T.& B. returns	36.89%	"
"	"	"	5 Wagon samples	38.40%	"
"	"	"	6 T.& B.returns	35.45%	"
"	"	"	6 Wagon samples	35.84%	"
"	"	"	7 T.& B. returns	36.11%	"
"	"	"	7 Wagon samples	37.30%	"
"	"	"	8 T.& B.returns	33.23%	"
"	"	"	8 Wagon samples	34.20%	"
"	"	"	9 T.& B.returns	35.46%	"
"	"	"	9 Wagon samples	36.70%	"
"	"	"	10 T.& B.returns	32.53%	"
"	"	"	10 Wagon samples	33.30%	"
"	"	"	11 T.& B.returns	32.99%	"
"	"	"	11 Wagon samples	33.60%	"
"	"	"	12 T.& B.returns	32.49%	"
"	"	"	12 Wagon samples	31.30%	"
"	"	"	13 T.& B.returns	34.69%	"
"	"	"	13 Wagon samples	35.03%	"
"	"	"	14 T.& B.returns	34.39%	"
"	"	"	14 Wagon samples	34.62%	"
"	"	"	15 T.& B.returns	36.44%	"
"	"	"	15 Wagon samples	36.20%	"
"	"	"	16 T.& B.returns	28.78%	"
"	"	"	16 Wagon samples	30.00%	"
"	"	"	17 T.& B.returns	31.99%	"
"	"	"	17 Wagon samples	31.13%	"
"	"	"	18 T.& B.returns	30.85%	"
"	"	"	18 Wagon samples	31.60%	"
"	"	"	19 T.& B.returns	29.80%	"
"	"	"	19 Wagon samples	29.30%	"

The foregoing report is made by Mahoney Brothers from our knowledge of the Mine, from data in our possession, smelting returns, different assays and reports, statements and suggestions made by Mining Engineers and Smelter Men.

(30)
Item 78

File Order
Subject

Arden, Nevada., Potosi Mine. Nov. 1st. 11.

Mr. W. F. Disbrow,
Care Shirley Hotel.
Denver, Colorado.
Dear Sir:-

Things are about the same as when you left here, the only difference is an new ore body on the first upper Level, in the long Drift. This looks very fine now and wish you could see it.
Also on the 2nd upper Level where Ray the Mexican was working, this I cut thru- to the other cross-cut and of course this was all ore as you knew when you were here. From this cross-cut I went up about 30 ft. or there abouts and started another little tunnel running due North and along this big fault, we are in this now about 50 ft. and all in the very finest of white zinc.
Think in following this big break will lead undoubtedly to another immense deposit.
I have had several letters from Mahoney Bros. but nothing to speak about in the news line. The last letter I received was last night and Mr. Pat Mahoney wrote me they intended installing an auto-truck, capable of hauling 12 tons daily and it was his idea to in--crease the present tonnage. I expect Mr. P. H. Mahoney here shortly.
I trust to hear from you in a little while. The folks join me in wishing you best regards etc.

Yours very truly,
W. E. Smith

WES/C.
N. B.
Mr. Mahoney wrote he had not heard from Mr. Swart and his crowd.

WES.
C.

Arden, Nevada., Potosi Mine. Nov. 8th. 1911.

Mr. W. E. Disbrow.
Shirley Hotel.
Denver, Colorado.

S.
Potosi, etc.

404

Dear Sir:-.

I am sending a sample of ore, cut and polished on one side, under seperate cover. This from the new place we are now opening up. It is an average sample of the whole drift as it is all this hard white zinc.

This is from the new drift started up about 30 ft. from 2nd Upper Level.

Yours very truly,
W. E. Smith.

WES/C.

E. W. DURFEE, MANAGER

30

Item

The Alvarado Gold Mining Company

CONGRESS JUNCTION, ARIZONA

Nov. 15th., 1911.

W. G. Swart, Western Representative,

American Zinc Ore Separating Co.,

1118 Foster Bldg.,

Denver, Colo.

Dear Sir:-

I received your circular relative to the treatment of zinc ores and from the statement on the last page would think you might be interested in a zinc property, a general description of which is inclosed herewith.

The property has been brought to my notice by the owners who have asked me to find a buyer. Their price is $400,000.00

Hoping that you will be interested, I am,

Very truly yours,

E. W. Durfee

Potosi

Good Spring, Nev

DURFEE, MANAGER

Red

The Alvarado Gold Mining Company

CONGRESS JUNCTION, ARIZONA

"POTOSI" ZINC-LEAD MINING PROPERTY.

The lowest estimate that has been made of ore in sight in this property was 75,000 tons of 34% zinc in the form of a carbonate ore and a much greater tonage of 15% to 30%, all of which could be made commercial with the proper treatment. 34% grade was shipped at a profit of $7.23 after paying cartage of $5.00, R.R. freight of $10.00, mining and sampling $4.00. Such a per ton profit means a total profit of $542,250.00 which in itself is more than the price of the mine and the statements are unanimous that the grade grows better with depth and that at no place is the limit of the ore body described. The surface outcrop is 4000 feet in length and 20 to 100 feet wide. There are 50,000 to 75,000 tons of rock on the dump taken from all parts of the mine, culls from ore assorted and shipped, which will run 10% 15% at least.

The development is by tunnel and can be developed to twice the present depth by tunnel making it ideal for cheap mining, with gravity haul to the mill site and water; the haul to the railroad is nearly all down grade.

In early days the property was worked for lead and silver and there are still quantities of that ore in the mine but it occurs in seggregated masses and bunches so that there is little or no interference with the zinc.

An antagonistic attitude exists among the various interests and the reports available are not complete, having been made at various stages of development and upon different phases of the mine but they all go to show that the character, quality and quantity of ore are there that should make an attractive proposition for investment.

The property is located in the Yellow Pine District, Sections 1,12 and 13, Township 23 S. Range 57 E. M.D.M., Lincoln Co., Nevada, about 23 miles from Arden Station on the San Pedro, Los Angeles & Salt Lake R.R.

Altitude 6400 feet. Good wagon road all of the way from the mine to railway. There are 12 mining claims and 6 mill site claims all patented. Geology, Algonkian limestone. Ore in massive and chamber deposits.

Surface improvements consist of commodious bunk house for employees, boarding house, dwelling house for superintendent, office, commissary building, stable and aerial tramway for conveying ore from mine to wagon road.

Nineteen shipments of ore by returns from Taylor & Brunton, Salt Lake gave an average of 34.05% zinc.