Report on the Dixie Meadows Mine.

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Nov. 13--23, 1906.

Location.

The property known as the Dixie Meadows Gold Mining Company, is located near the head of Ruby Creek, on Dixie Mountain, Grant County, State of Oregon, at an elevation of about 5200 feet, and is 12 miles North of Prairie City, Oregon, and about 28 miles (by wagon road), West of Austin, Oregon, the present terminal of the Sumpter Valley Railroad.

Claims.

The Company owns the following ten claims, Gladys, May Blossom, Kyuse, Clara B., Annie M., Laura D., Tiger, Ruby, Zola, and Lois quartz claims each 600 feet in width by 1500 feet in length. The total area is 181.24 acres. See Plate 1.

Title.

The claims are held by United States Mineral Survey patents, and while the final patent papers have not been issued,(due to the slow working of the Land Office) the Company holds the Land Office receipt for same. The patent survey number will be 513 when issued.

History.

The property was located in May, 1900, and the present company organized May 30, 1901 and has been operating almost continuously until July 1, 1906. The present company has spent about $107'000 in buildings, machinery, and development work.

Geology.

The property is located on what I shall term a slate belt running N. E. and S. W., and we find granite on both sides of the slate. There are several porphyry dykes running along through the slate, and having the same general direction, and the ledge of the Dixie Meadows is found along one of these dykes. The ore is found at and in the contact between the slate and the porphyry. The ledge along the surface is from 8 to 20 feet in width and can be traced on the claims for a distance of about 4000 feet. The vein filling is made up of a brecciated slate and porphyry with a network of quartz stringers carrying sulphids. The vein has a strike of N. E. and S. W. and dips to the East 40 to 60 degrees.

Mineralogy.

The ore on the foot wall consists of quartz stringers, scattered throughout the vein carrying Pyrites, (iron sulphide), Sphalerite (zinc sulphide), small amount of Galena (lead sulphide). The ore on the foot wall is low grade and it is doubtful whether it can be mined at a profit. The ore opened up on the hanging wall is of a much better grade, and is found in very hard slate lenses. Practically all the stoping has been done in this ore and the good ore has all been gouged out, above the drift.

Development.

The property is developed as follows; 1st. A tunnel on the vein for about 100 feet, (not shown in plates). 2nd. A cross-cut tunnel 260 feet long, cutting the ledge at a depth of 150 feet below the upper tunnel; about 400 feet of drifting and cross-cutting has been done on the vein. A great

fault of the development work is that neither wall has been gegularly followed, and sometimes a slip has been encountered and followed for a wall. A raise 70 feet high has been run up from this No. 1 level, and an intermediate drift of about 75 feet has been run. This drift is not in pay ore. 3rd. A lower cross-cut tunnel of 460 feetxxxxx cuts the vein about 140 feet below the No. 1 level, and about 650 feet of drifting done. This is our No. 2 level. The true foot wall has been followed a short distance and then left. Two cross-cuts have been run to the hanging wall. The first one shows a bulge in the porphyry dyke. The 2nd. cross-cut has broken into a lense of good ore on the hanging wall, and drifting has been started in both directions. The ore above the level has practically been stoped out. A 100 foot winze, or shaft, has been sunk on the foot wall side of the hanging wall streak, and the foot wallof the streak followed as the hanging wall of the shaft. Four upraises have been run up from the No. 2 level; Two are up a distance of about 55 feet in barren ground, and are not shown in the plates. One upraise 140 feet high connects No. 2 level and No. 1 level, and was run up in low grade ore, but there is not enough to to mine at a profit. The other upraise 70feet high was run to an intermediate level, between No. 1 and No.2levels. There have been several short cross-cuts run into sides of the drift, but have exposed nothing but barren ground. For a better description see plates 2 and 3.

Production.

Since the mill was erected in 1903, there has been 2200 tons of crude ore treated and 187.36 tons of concentrates produced, yielding a gross value of $7761.55 by concentration and $4537.53 by amalgamation, making a total gross production of $12299.08. This on a basis of $5.59 per ton and with an

average tailing of $2.20 gives a gross value of $7.79 per ton of crude ore.

Ore Development.

Under this heading I shall use the term probable ore as the ore is opened up but on two sides. The ore chute begins about 10 feet North of Survey Station No. on No. 1 level and extends to South face, where it is 14 feet wide. The ore as sampled by myself along bottom of drift will average $7.00 to$8.00 per ton. The ore varies in width from 2 to 14 feet, and taking an average width of 5 feet, and for a distance of 140 feet in length and 150 feet in height. We have 10500 tons of probable ore above No. 1 level. We have 105000 Cu. feet(ten cubic feet in place equal one ton). The ore chute is found on the intermediate level, about 35 feet North of South face, and believing that the ore body extends as far as the South face on No. 1 level. We have 140 x 70 x 5 equals 49000 cubic feet equals 4900 tons. The short distance opened up will average $6.00 to $7.00 per ton. The ore chute is not reached on the No. 2 level until we reach the Survey Station "J", and then as the drift cuts the vein diagonally and runs off toward the hanging wall it is difficult to estimate the tonnage. The average of assays taken on the foot wall of No. 2 level is $3.40 per ton. As a rough estimate based on the above assumptions as to length of ore chute, I think that development work would expose possibly 10'000 tons of ore between No. 2 level and intermediate level. The length of the ore chute has not been determined, and allowing the amount of ore taken out in drifting to be beyond the S. face, I think that there is about 25'000 tons of ore on the foot wall, as is exposed at present. It is impossible to estimate the value of the ore exactly, but it is between $4.00 and $8.00 per ton.

The present management gives an average width of 15 feet, which would bring the tonnage up to 75'000 tons, which I consider high. The hanging wall streak forms ore in lenses which have been worked out above No. 2 level, as shown in Plate 3. It is probable that development work in drifting North from winze will open up other lenses of good ore.

Ore Values.

A careful investigation of the Company assay book fails to give any information. About 2000 assays have been made, but no description given. See assay Certificates and under heading of Ore Development.

Treatment.

The ore opened up at the present time can easily be treated in the following manner;- Crush to a mesh fine enough to separate mineral from gangue, which will be about 20 to 30 mesh. The best fine crushing agent will be stamps. Pass pulp over amalgamation plates, catching the free gold. The tailings from the plates are now to be passed on to concentrating tables; concentrate pulp and treat the middlings and tailings from these tables on sliming tables. The tails from the sliming tables are to be discharged into a tailings dam, to be saved for future treatment, possibly the cyanide process.

Plant and Surface Improvements.

The Company owns the following:-

1 Bunk house, accommodating 50 men,

1 Boarding house, accommodating 75 men, Stove,dishes, etc.

3 Private houses, Manager, etc.

3 Log Cabins,

1 Office,

2 Barns,

1 Assay Office and equipment,

1 Saw mill, capacity 5000 feet per day,

1 Blacksmith shop, tools for same,

1 Mill, capacity 15 to 25 tons per 24 hours.

The property is equipped with the following machinery;-

1 No. 2 Austin Gyratory Crusher,

1 6 x 10 Blake Roll jaw,

2 Challenge ore Feeders,

2 Revolving Trommels,

1 Set 36 x 6 Sturtevant Rolls,

1 Set 26 x 4 Sturtevant Rolls,

1 5 foot Huntington Mill,

4 12 x 4 Copper Plates,

5 New Standard Concentrating Tables,

1 Rand Compressor, (capacity 640 cubic feet per min.)

1 100 H. P. Boiler,

1 65 H. P. Slide Valve Engine,

1 12 H. P. Upright Engine,

1 200 Volt Dynamo,

1 6 x 8 Geared Hoist,

1 No. 7 Cameron Pump,

Full line of air drills, mining cars, tools, etc. and represents a cost of about $45'000.

Mining Facilities.

Fuel. Wood is the only fuel burned in the boilers at the mine, and costs $2.75 per cord delivered at the mine. With the withdrawal of the near by timber land into the forest reserve, wood will cost $3.75 per cord delivered at the mine. Blacksmith's coal costs $28.00 per ton delivered at the mine.

Mining Timber. The property is heavily timbered with an excellent grade of mining timber and there is enough to last for several years.

Water. There has been very little water encountered in the mine. There is enough water in Ruby Creek for mining and domestic purposes, but there is not enough water to treat more than 10 to 15 tons of ore in the mill. This shortage of water could be remedied in two ways;- 1st By building a large reservoir below the mine and pumping back to the mill. A reservoir and pumping plant could be installed for about $10'000 and would supply plenty of water. 2nd A better plan provided development work in mine proved up satisfactory, would be to build a mill on the Middle Fork of the John Day river 3 1/2 to 4 miles away and connect with the mine by an ariel tram. This could be done at a cost of about $1.00 per running foot,($20'000). This is more expensive but it has its advantages, namely 1st Ample water supply all the year. 2nd Enough water power could be developed to run mine and mill by electricity. 3rd Provided the railroad does not build in by the Middle Fork, the transportation charges for concentrates would be greatly reduced. 4th If the railroad comes in, the mill would be close to same.

Supplies. Mining supplies are high, due to the high freight rate, $1.00 and $1.75 per 100 pounds.

Roads. The roads are excellent from the mine to Prairie City and to Austin, and with very little annual expense can be kept in excellent condition.

Wages. Miners $3.00 to $3.50 per day, of 10 hours,
Blacksmith $4.00 per day of 10 hours,
Hoist Engineer $3.50 per day of 10 hours,
Mill Engineer $3.50 per day of 12 hours,
Mill man $5.00 per day of 12 hours,
Shaft men $4.00 per day of 8 hours,
Roustabouts $2.50 per day of 10 hours,
Concentrator men $4.00 per day of 12 hours,
Shift bosses $3.50 to $4.00 per day of 10 hours,
Timber men $3.50 to $4.00 per day of 10 hours,

Surface Plant.

Mill. Considering the low grade of the ore, the present mill is entirely too small to treat the amount of ore that must be milled to work at a profit. The present system of crushing is adopted to the ore and much excess power is now used. A new 100 ton mill would cost about $50'000, and using the present machinery, tables, etc. could be built for about $40'000. I do not consider it advisable to erect a new mill until more development work on the chute has been done.

Miscellaneous.

Timbering. When work is pursued on a large scale, I think it advisable to use a system of square set timbering to hold up the ground.

Electric Power. The present management informs me that the Olive Lake Power Company will be prepared to furnish electric power after May 1, 1907, for $50.00 per H. P. per year. The mine would need 100 to 150 H. P. making the annual cost of power $5000 to $ 7500 a year. The mine now burns 5 to 7 cords of wood daily. At present wood costs $2.75 per cord and will be $3.75 per cord in the near future. This would mean a present annual expense of $5000 to $7000 and $6500 to $9500 in the near future. Electric power would not only be a cheaper power, but would save the timber (now burned as fuel) for other purposes.

Costs.

As to the cost of mining, I could not get any exact information at the mine, as no regular system of accounts was kept. Therefore I have taken as a basis of my estimate the actual costs of a large mine operating under conditions similar to what the property would have to work on. The tonnage was 75 to 80 tons per 24 hours. The following is an average of 7 months run.

Mining.----------$2.82 per ton.
This includes labor, powder, fuse, caps, drill steel, car track, timbering, delivery to mill, etc.

Milling. ----------$1.15 per ton.
This includes labor, crushing, milling, power, and sacking the concentrates.

Development Work. ----------$2.12 per ton.
This includes all dead work where ore was not being extracted.

Miscellaneous. ----------$1.56 per ton.
This includes general expenses, office expense, salaries, etc.

The total cost for mining, milling, etc. of ~~the~~ 75 tons equals $7.65 per ton, and per 100 tons could be done for $6.00 to $7.00 per ton. The total cost for the lowest month came to $5.66 per ton or $4.50 to $5.00 per ton for 100 tons. The average cost for mining and milling comes to $3.97 per ton with $2.28 for the lowest month. Taking for example the lowest cost of mining and milling of $2.28 per ton and the ore concentrating 10 to 1; this would give a cost of $22.80 to produce a ton of concentrates.

Haulage from present mill to Austin,--$10.00 per ton,

Haulage from proposed mill sight to Austin,--$5.00 per ton,

Freight from Austin to Sumpter Oregon,--- $2.00 per ton,

Smelter charge for treating ore,---------$8.00 per ton.

The total cost of sending and treating 1 ton of concentrates would be $20.00 per ton under present conditions.* This would mean that it would cost to mine, mill, and treat at smelter under the most favorable conditions about $35.00 per ton of concentrates. To this must be added the development expense, (most important for mine's future), and miscellaneous expense. The probable conditions would bring this cost up very much higher.

* and $12-$15 under proposed new conditions

In my opinion, to work the mine at a profit under the existing conditions, or the proposed new conditions, on a basis of 100 tons per 24 hours, it would require an ore averaging $8.50 per ton and making a ten to one concentrate with a 90% extraction.

Conclusions and Recommendations.

1- The property is well equipped with machinery, tools, etc. to begin active development operations.

2- There is considerable probable ore blocked out on foot wall and while I consider that it will be of too low an average to mine at a profit by it-self but mixed with a higher grade of ore could be very profitably handled.

3- I do not recommend the building of a new mill until a higher grade of ore is developed, and believe that the development and opening up of the hanging wall streak will show this higher grade ore. To open up this streak drifting should be commenced from the bottom of 100 foot shaft, and if values are good, sinking should be commenced, etc.

4- The Company should put in a machine shop; this would save considerable expense.

5- The Company could operate a Company store and probably make enough from the store to pay salary to store keeper, who would also be the Company book-keeper.

6- Follow regular system of running drift on one wall, or the other and at frequent intervals; cross-cut to opposite wall.

7- I do not recommend the erection of a tailings plant until the results are tested under the proposed new conditions.

Respectfully submitted

Tenney G. DeSollar. E. M.

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