REPORT ON THE RIVERSIDE MINE, AVOCA.

(Lease 9925M).

The writer examined and furnished a report on this property in February of last year. At that time very little work had been undertaken to prove the extent and character of the deposit. A number of shafts had been sunk through the drift, but the majority of these were inaccessible owing to being partly filled with water.

Subsequent to that time a company was formed and a pumping plant installed to raise water from the South Esk River for sluicing purposes.

Active productive operations were carried on for a number of months, when work was suspended, the quantity of tin obtained not being sufficient to pay working expenses.

MINE WORKINGS -

Following the necessary preliminary work preparatory to productive operations, sluicing was commenced at a point on the main rim of drift, and a paddock, aggregating an area of a few square chains, was worked. The bed rock proved to be very uneven which put difficulties in the way of efficient handling of the drift, particularly as the heavy boulders adjacent to the bed rock increased in proportion to the fine portion of the drift. Further trouble in working the drift was accenuated owing to its unusually cemented condition, making it very difficult to remove by ordinary sluicing methods.

There appears to be every indication that a certain degree of silicification has occurred through the drift subsequent to its deposition, probably due to organic agencies, causing a precipitation of silica in percolating waters carrying small quantities of silica in solution. The degree of silification is slight but sufficient to render the fine drift material very hard to disintegrate.

The water worn boulders in association with the drift consist of silicified mudstone sandstone of the Permo-Carboniferous age, well rounded granite boulders also occur through the drift as well as diabase and quartz.

The fine grit and clay derived from the decomposition of the feldspar of the granite which originally contained the tin oxide carried well payable quantities of the latter, which occurs in medium sized grains, that is up to 1/16" in diameter A proportion of the tin, however, is of much finer character.

The occurrence of this bed of drift is much more uneven that the original prospecting work indicated.

The most northerly portion of the ground worked, the face shows a depth of 4 feet of wash consisting of coarse shingle, individual pieces being up to 1 ft. in diameter.

The proportion of heavy stone in this face would represent fully 50 per cent of the whole. At the surface it is covered with a foot in depth of sandy loam; below this and resting on the tin bearing drift is a layer of clay 2 to 3 ft. thick. The bed rock is of soft granite having an undualting surface with a tendency to dip westerly.

The largest paddock has been taken out on the south western portion of the area worked. The drift here is from 4 to 5 ft.

in depth fully half of which is composed of very heavy boulders the surface portion consists of a depth of 5 ft. of clayey material.

Up to present only a small area of the ground originally prospected has been worked. Portions of it tested by shafts, samples from which gave encouraging results, have not had any further attention. Nothing has been done to ascertain if the remaining portion of the area is cemented to the same extent as that worked. The chief cause of the failure of the company to make the work profitable was due to the cemented nature of the wash, in addition to the large portion of heavy stone to be removed, requiring more than double the quantity of ground to be shifted than would normally be the case to obtain to same yardage in a given time. Added to this disadvantage was the additional cost entailed in the removal of the heavy boulders by hand labour.

METHOD OF WORKING -

Sluicing work was carried on under nozzle pressure; water being pumped up from the South Esk River through a 12" diameter pipe line 16 chains in length, the total height the water is raised being 40 ft; to this must be added additional pressure for nozzle work on the face.

The power unit consists of crude oil engine manufactured by Shanks. The working horse power is given as 80, the engine is tested to give out 92 B.H.P. Speed of engine 225 revolutions per minute. Year of manufacture 1927. The engine is belt coupled to a 2 throw 6" Centifugal Pump.

The plant is provided with an electric lighting set consisting of 4.2 K.W. Generator, 230 volts, 1430 Rev. per minute, 5 H.P.E. Motor 240 volts, 1250 Rev. Per min., shunt wound Broome and Wade compressor and light plant operated by a super Diesel Engine by Mr. McDonald. The plant is well housed and substantially built on concrete foundations.

The comparatively small height (40 ft.) which the water requires raising should leace an ample margin of power to provide for high nozzle pressure at the working faces

Whatever pressure could be maintained, the cemented condition of the wash prevented anything in the way of a normal quantity of ground being shifted for the work performed.

The use of explosives for loosening the drift would not be effective owing to the heavy nature of the drift.

The sluiced material was graviated to the head of a tail race several chains in length which was cut through solid granite rock. At the head of the race the excavation is 10 ft. deep. A limited amount of work was carried out below the tail race level, the drift being lifted by hydraulic elevator. At the time the writer visited the mine the excavation at the head of the tail race was filled with water.

VALUE OF DRIFT -

To take samples from the various exposures in the working faces to determine the quantity of tin would not necessarily serve as a guide in estimating the tin content of the deposit as a whole. The amount of tin recovered from the quantity of

ground treated can be computed, but this would not give an accurate estimate of the value of the ground owing to the loss of tin resulting from sluicing operations represented in the tailings heaps distributed over the ground below the sluice boxes.

The actual loss of tin in sluicing could not be estimated from samples of the tailings, as a certain amount of concentration in the debris has occurred.

The lighter portions of the original drift when once broken up with water and kept in motion would be discharged into the River. The coarser material in association with the greater portion of the tin escaping from the sluice boxes would be deposited on the sloping ground below the boxes. Some of it would be discharged in the Creek flowing close by when further concentration of the tin would occur.

Whatever degree of concentration the discharged material has been subjected to could not be closely ascertained. A true estimate of the quantity of tin escaping with the tailings discharge could be made only by taking regular samples during actual sluicing operations.

From an examination of samples of the tailings discharged it is very evident that the loss of tin was excessive and it is very probable with appliances which would have ensured a normal recovery of the tin in the drift the position of the Company would have been much better to-day.

No attempt appears to have been made in ascertaining if any other portion of the area offered better sluicing conditions than that worked.

At a point eight chains from the discharge end is the pipe line, thence about three chains distant on a bearing N. 68° W. an old cut has been taken out for a width of 8 ft. sloping to about 3 ft. at the bottom. This hole has about 2 ft. in depth of water in it. The drift exposed here is of very favourable character and appears to be free of cementing material. The drift which shows very good prospects of tin, contains a quantity of heavy wash, but not in excessive amount. From this spot an old channel extends towards the pipe line. An investigation of the possibilities of opening up a face of drift here should be made.

An examination was made of the possibilities of the occurrence of payable drift on the opposite side of the Rosier Creek. The conditions there are unfavourable owing to granite rock outcropping, there being no opportunity for the lodgment of drift material in quantity. The old workings along the creek bed some chains northerly of the main workings were examined, the prospects there are not encouraging either in matter of quantity or value of drift available.

CONCLUSIONS -

The disappointing results obtained from sluicing should not deter the Company from carrying out further investigations on the lead of drift westerly of the faces recently worked.

The site referred to along the pipe line should be investigated and shaft sinking ahead of this apparent run

run of wash should be resorted to. The area has prospects which are worth further investigation considering that all facilities in the way of machinery and plant are available.

The Company hold Water Right 2505/W on the South Esk River ten sluice heads, and Water Right 2481/W on Rosier Creel, three sluice heads.

J.B. Scott

STATE MINING ENGINEER.

Mines Department,
Hobart.
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