REVIEW OF OPERATIONS AT THE DOME MINE, SOUTH PORCUPINE

Written specially for the Canadian Mining Journal.

During the past year, wonderful progress has been made throughout the whole of the Porcupine camp, and at no place has this been more noticeable than at the Dome mine. Following the fire of July, 1911, considerable time was lost in getting in materials, so that a large portion of the heavy construction work had to be performed in the dead of winter, with the temperature often many degrees below zero.

At the beginning of the year, following the appointment of Mr. W. W. Mein as consulting engineer, several radical changes were made in the crushing stations, and also in the mine development plans, so that the real work of the company may be considered to have started at that time.

Mine.

The ore body consists of a large mineralized zone, in which occur lenses of ore, but the values are so distributed that the whole deposit may be worked with very little sorting. So far, all the work has been done by open-cut methods, and what sorting is necessary is accomplished by cleaning out the stope and then shooting down the waste rock which is trammed out separately.

During the first part of the year, development work was largely confined to the 45-foot level. This was necessary on account of the lack of power and for the purpose of bringing the mine to the producing stage as rapidly as possible.

Raises were put up at intervals, and at the bottom of the raises, chutes or boxes were built. These chutes were built sufficiently strong to permit of blasting large pieces which sometimes get into them. All the mining is open-cut work, the ore being broken into the raises, which are kept full so that large blocks may be sand-blasted at the surface. The actual breaking of the ore is done by hammer drills and a duty of about 50 tons per man per day of 9 hours is attained.

The broken ore is drawn from the bottom of the raises into 16 cubic feet V-shaped side dumping cars, and the tramming is done by mules.

As soon as possible, the development work on the 100-foot level was completed and raises put up to connect with those on the 45-foot level. On account of the greater lift, fewer raises are necessary.

An interesting feature of this property is the incline from the crusher station to the 100-foot level. This did away with the necessity of hoisting the ore through a vertical shaft and tramming it to the crushers, and while serving to develop the west end of the property, is remarkable for its simplicity and the ease and economy with which the tonnage is handled.

The breaking of ore, tramming, hoisting and crushing is all done on the day shift.

Crusher Station.

The ore is hauled up the incline in trips of four to six cars, and is dumped direct into a No. 7½ gyratory crusher. The broken rock falls on a conveyor belt and is elevated to a pair of No. 3 gyratory crushers, first passing over a grizzley which takes out any material which will pass through an inch ring. This undersize and broken rock from the No. 3 crushers which will pass through a two-inch ring, falls on a second belt conveyor which carries it to the mill bins. The advantage of this method is that both sets of crushers are on the ground so that the construction work is very simple and the crushers are always on a solid foundation.

Mill.

The mill was designed and erected by the Merrill Metallurgical Company and has fully borne out the promises made for it. It is a steel and concrete structure, covered with two layers of corrugated iron between which was placed a layer of hair felt to provide an insulating material and permit of economically heating the building.

The ore from the 1,600 ton bins is crushed through 12-mesh by 40 stamps of 1,250 pounds each, the pulp passing over the primary amalgamating plates to four Dorr classifiers. These primary plates are to be discarded as the scouring action of the coarse pulp prevents efficient amalgamation. From the classifiers, the slimes pass over a second set of amalgamating plates and then direct to the Dorr thickeners, the coarse sand going back to the tube mills. The product from the tube mills is pumped back to the classifiers, this process being continuous. From the Dorr thickeners, the pulp is elevated to four Pachuca air agitation tanks 40 feet high by 8 feet in diameter, the cyanide being added at the elevator boot. From these tanks, the pulp passes two Dorr thickeners and then to a mechanical agitator which is used solely to prevent the solids settling before they are sent to the presses. These presses are Merrill pressure filters, and have been found to be most satisfactory for this class of ore. The presses discharge into Dorr thickeners, where some of the water is saved and is used again as wash water.

The precipitation takes place in Merrill zinc dust presses, the resulting product being treated first in a small blast furnace with litharge. The lead bullion is then cupelled, the product being remelted in an old-heated tilting furnace.

The mill is efficient, and ore extraction of 97 per cent. is attained. Of the total gold recovered, about 60 per cent. is obtained from the amalgamating plates.

The treatment of this ore does not present any metallurgical difficulties, the only troubles being of a mechanical nature. The stamps have a duty of 10 tons per day, but the tube mill and press capacity is only 350 tons per day. A new tube mill and filter press are being installed and, when these are in operation, the mill should treat 400 tons daily.

Company Organization.

The organization is divided into different departments, each department having its separate head. The lines of distinction are clearly drawn, there is no overlapping of authority, and each head is directly responsible for the work of his own department.

The sub-divisions are as follows:

Mill Superintendent, who has charge of the mill and assay office.

Mine Superintendent, who has charge of the mine.

Mechanical Engineer, who has charge of all surface labor, power house, machine shope, boiler shop, black-