

PRELIMINARY REPORT ON THE MICHAEL TIN MINE.Location and Access :

The Michael Tin Mine is situated immediately to the north-west of Mount Michael - a small hill rising about the general level of the northern slope of the Blue Tier, one and a half miles north of the township of Poimena.

Access to the mine is gained by a road from Poimena nearly two miles in length. Poimena is connected by a road, three miles in length with Lottah, which has steep grades from the latter to the former township. Lottah is in turn connected by good motor roads with St. Helens on the East Coast and Herrick, the terminus of the North-Eastern State Railway.

Leases :

The mine is situated on section 9152/M of 20 acres leased by the Michael Tin Mining Co. N.L. This company also holds section 9269/M of 5 acres on which the treatment plant is situated; a water-right (2325/W) on the Wyniford River and a tramway easement (2321/W) between the mine and the treatment plant.

Geology:

Only the immediate vicinity of the mine workings was examined and it was found to consist of an altered granite rock. The surrounding country consists of this same altered rock or else the normal granite of the north-eastern districts. The latter is a porphyritic type containing porphyritic crystals of felspar in a coarse-grained matrix composed of quartz, felspar and biotite (black mica). The altered rock appears in hand specimens to be uniform in grain and to consist of quartz, felspar (partly or wholly altered) and a dark mica. Whether the latter represents the unaltered biotite of the normal granite or is an alteration product derived therefrom cannot be definitely determined in hand specimens, but the latter view is probably the correct one.

The cassiterite (tin ore) is associated with this altered granite. It is generally present only as small grains easily discernible by those constantly handling the rock. The rock is traversed by narrow and discontinuous veins of pegmatite containing generally quartz, felspar and the dark mica, and often coarsely crystalline cassiterite. One or other of these minerals may predominate over the others in some of these pegmatite veins. It is evident that the formation of these veins, the introduction of the cassiterite into the granite and the alteration of the latter were closely related and probably represent merely different phases of the one process.

The tin-bearing rock has very prominent horizontal joints giving it the appearance of occurring in "floors" as is common in similar deposits on the Blue Tier. Vertical jointing is also common but the horizontal joints appear to have a much greater effect on the cassiterite contents than the vertical ones. This fact has been proved during the working of the mine and the occurrence of horizontal layers with different tin values supports the conception of "floors".

Extent of Tin-bearing Rock :

The extent of the altered granite was not delineated during the short trip upon which this report is based.

It could be determined by a survey of the surface and is stated by the late W.H. Twelvetrees to have a width of a quarter of a mile from east to west and a general trend from north to south. The whole of this altered granite may be tin-bearing but only a portion will probably be found to be payable to mine and treat. Until the workings have advanced sufficiently to prove the mode of occurrence of the "shoots" of payable ore, the latter will be determinable only by sampling and by co-operation between the mining and treatment and observation of the resulting recoveries. At present only the upper 15 to 20 ft. is being mined, the bottom 5 to 10 ft. being considered less payable. The value of the rock below this level is not known and other payable "floors" may exist. Only small "leaders" (pegmatite veins) have so far been followed below the bottom of the quarry.

Mining Operations :

The mine workings consist of a main open-cut with a smaller one to the east but which will ultimately be absorbed in the main one. The area of the cut is about $1\frac{1}{2}$ sq. chains and it has a depth of 25 ft. approximately. The only overburden consists of a few inches of soil and subsoil, which if similar to that which has been sluiced in adjacent areas, must be tin-bearing.

The conditions are thus very favorable for economic mining. If, however, as Mt. Michael is approached, some of the upper "floors" prove unpayable, they will have to be removed as overburden, or else underground mining operations will have to be resorted to. Even assuming the floor being worked at present is the only payable one, there is possibly a considerable area over which it can be quarried without overburden.

Treatment Plant :

The plant consists of jaw-crusher, a 15-head stamp battery and three concentrating tables. Only 10-head of stamps are at present in use. Power is supplied by two suction gas engines supplied by a wood producer plant.

Production and Values :

It was stated by Mr. Lawry, the mine manager, that the plant had been in operation for a period of 50 weeks and that tin to the value of £6350 had been sold. The crushing of the previous week (Oct. 18 to Oct. 23) was said to have given a recovery equivalent to 0.28 per cent ore. This content appears to be somewhat low, but was stated to be payable. This is possible on account of the very cheap rate at which the ore can be broken from the open cut.

Conclusions :

The ore being worked consists of an altered granite containing cassiterite. The extent was not determined, but according to the late W.H. Twelvetrees the belt has a north and south trend and is a quarter of a mile wide near Mt. Michael. If only a portion of this belt consists of payable ore there should even then be considerable quantities available for mining. As far as determined the shoots of payable ore occur in "Floors". Sampling and attention to treatment results will probably be necessary to determine the exact mode of occurrence of the shoots. At present mining operations are being carried out in an open-cut which permits of cheap mining costs and profitable treatment of ore of value as low as 0.28 per cent. If quantities of ore of this value or even slightly higher, say 0.30 per cent, can be proved to occur under conditions permitting of open-

cutting as above, the mine should have a successful future.

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P I O N E E R
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