

PRELIMINARY REPORT ON TIN ORE
DEPOSITS IN EXE RIVER AREA

Preliminary Statement

This report is the result of a two day visit of inspection, and is therefore an incomplete account of the ore deposits, which in every respect are worthy of a more thorough investigation. However, the information obtained and given herein will serve to convey an idea of their nature, extent, and value, of their position in relation to lines of transport, and the conditions for mining and treatment of the ore. The report deals with Salmon's and Connell's leases only.

General Statement.

Tin ore mining in this field has not been successful mainly because development works have not been carefully planned, and one scheme in particular was so ill-advised as to result in the discrediting of others. In that case the operators erected a metallurgical plant for the treatment of the ores before it was warranted by developed ore-reserves. This policy resulted in the abandonment not only of the mine referred to but to some other partly developed ore-bodies in the neighbourhood.

The operators on Salmon's and Connell's properties, on the contrary, are gradually developing the ore-bodies on systematic lines and are applying all expenditure to exploration underground. As a result of that policy the lessees will be able to determine with a fair degree of accuracy the economic values of their properties and will not have any misgivings as to their subsequent operations.

Development of these rather narrow, long veins of ore has been slow but has been productive of encouraging prospects. The individual value of each vein is not high, but the collective value of each group of veins may prove to be of commercial importance. It is desirable, therefore, that each exploratory work should be so designed as to embrace each group of veins.

Situation, etc.

The situation with respect to lines of transport is particularly favourable because the Emu Bay Railway passes through the properties. Moreover, the topographic relief is such as to allow of mining through adits to depths of 200 to 300 feet.

Exe Rivulet and Pieman River pass through the properties provide an ample supply of water for all purposes in all seasons.

Geologic Relations

The area is occupied by the Dundas series of slates, tuffs, and sandstones and intruding dykes of Devonian serpentines, pyroxenites, and gabbros, which are genetically related to the outcropping acid porphyries in the neighbouring areas. The acid porphyries are responsible for the deposits of tin ore although it is not certain that they outcrop in this area. In the southern workings on Connell's property a dyke of acidic rock penetrates the Dundas series, but whether it is of Devonian age and related to the tin-producing intrusives is not known. A dyke of similar material

outcrops in the South Renison Bell lease on the west side of Colebrook Hill an acid porphyry boss undoubtedly of Devonian age projects through the serpentines. This is an offshoot of the main underlying granitic batholith as are also the porphyry dykes of Renison Bell.

The Dundas series of sediments and tuffs trend in a north-easterly direction.

The Ore Bodies

The ore bodies are of the fissure vein type, and consist of arsenopyrite with comparatively small proportions of siderite cassiterite (tin ore) chalcopyrite, and pyrite the whole set in a gangue of quartz. They are remarkably persistent along the strike, the main body passing unbroken through Salmon's and Connell's properties. The vein filling is tin bearing the whole length, but is much richer in certain parts than in others. In Salmon's lease the ore body consists of an almost barren section of white opaque quartz on the hanging wall and a tin-bearing arsenopyrite-pyrite-quartz section on the footwall. These sections are quite distinct and represent two stages of deposition.

Salmon's Lease

This is a 40-acre lease (9452M) charted in the names of A. J. Salmon and R. W. Marshall. The Emu Bay Railway line crosses the north-east quarter and the north-east corner is on the bank of Pieman River. Two important ore bodies are exposed in this lease namely, Main Lode and Railway Lode.

Main Lode has been opened at intervals in trenches, pits, and adits from north-west to the south-east sides of the property. It courses N. 40°W and dips N.E. at 75°.

Near the S.E. Boundary the lode as exposed in trenches is 8 to 12 inches wide increasing in size westward. Here it appears to dip S.W. into the hill. Arsenopyrite is less prominent, pyrite more abundant, but quartz forms the bulk of the ore. Coxcomb structure of prismatic quartz is noticeable in the middle of the vein the materials of which exhibit also banded formation. The quartz is blebbed and flecked with arsenopyrite, pyrite, and cassiterite. In places the arsenopyrite component is in equal proportion to quartz, and fluorspar is occasionally discernible.

Farther westward the lode has been trenched along its course and on the hillside 120 feet above main adit it is opened in a deep cut. Here it consists of two bands made up of ten feet of almost barren quartz ore on the footwall. Between the two sections are veinlets consisting almost wholly of cassiterite. Pockets of rich ore are occasionally found in the arsenopyrite-quartz section.

The lode is again exposed in a short adit crosscut about 20 feet lower. Here it is four feet wide and of similar materials. Parallel veins 3 to 4 inches wide were intersected in this crosscut.

The most important opening is main adit

crosscut driven on a bearing S. 55°W a distance of 224 feet. It exposes a wide section of Pieman River terrace gravels, then graphitic slate and tuff, and five feet of ore. The lode where cut is very sharply defined lying against a hanging wall of shattered graphitic slate and resting on

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indurated tuff. The two feet section only on the footwall contains tin in profitable proportion. Drives on the lode 15 feet each way from the crosscut expose ore similar in all essentials to that of higher levels with however a larger amount of fluorspar. Samples of the footway section show a tin content of 0.7 to 0.83 per cent, and a content of 0.05 per cent only in the hanging-wall section. Siderite is prominent not only in association with quartz in the lode and cementing broken wall-rock, but in close association also with arsenopyrite-coarsely crystallised cassiterite and quartz ore found as geodes in the sulphidic portion of the body.

Large boulders of ore on the hillside above main lode indicate the presence of another parallel body. The extension of main adit crosscut is desirable to explore the south-western quarter of the property.

The Railway Lodes are exposed in a sidelong cutting of Emu Bay Railway. There two bodies 12 and 24 inches wide are separated by mineralised tuff 15 feet in width. They course N 32°W and dip N.E., and are reported to contain tin ore from 0.73 to 0.90 per cent. An adit crosscut, 70 feet above the river and 50 feet below the railway has been driven in a south-westerly direction to intersect them. Very little exploration, however, has been performed.

Summarising the foregoing account it may be stated that the conditions as regards mining and transport are particularly favourable, and it may be reiterated that the policy of the operators to thoroughly explore the lodes and develop large reserves before applying expenditure on metallurgical works is one that could be followed with advantage by other companies engaged upon similar undertakings.

Connell's Lease

This is a 40-acre lease (9541M) charted in the name of M. Connell. It lies south-east of and adjoins lease 9452M and encloses the extensions of the lodes found on that property.

Main lode near the western boundary is small 8 to 12 inches but it is generally of high grade where exposed in trenches. A bulk sample taken from this part of the lode contained tin in the proportion of 2.6%. In places bunches of very rich ore have been opened, but the average value is little over 0.5%. Main lode is opened near the middle of the section in a shaft and open-cut 8 inches wide, a sample from which yielded tin in the proportion of 0.6 per cent. The lode is exposed again in cuts and trenches on the west bank of Exe Rivulet, and in the bed of that stream it is over 12 inches in width. In places the detrital material has been sluiced for tin ore.

The apparent extension of Railway Lode is opened in an adit crosscut about 100 feet from the railway line close to the culvert over the Exe Rivulet. At 60 feet from the entrance of the adit, which bears S. 70°W a body of ore two feet wide is intersected, consisting of 12 inches of quartz and 12 inches of quartz-pyrite-arsenopyrite. A sample of this ore contained 0.4 per cent tin.

Thirty feet farther in this crosscut connects with a shaft sunk on Main lode from an open-cut. There the main lode is 4 feet wide.

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In the crosscut east dipping veins of banded quartz 6 to 8 inches wide are cut at 85 feet and 105 feet. Another body, known as South Lode, has been worked for arsenical pyrites. This body is in all respects similar to those described except in the proportions of its component minerals. Here the ore is predominating arsenical, with also abundant pyrite set in a gangue of quartz. This body is exposed at 155 feet in an adit crosscut bearing S 67° W and in north and south drives therefrom, coursing N 17° W for 30 feet and S 14° W for 41 feet respectively. The lode lies along the course of a grey schistose rock which is adhered in parts to light green talc. The nature of this rock has not been determined. At the south end of the drive the lode peters out in this rock. Some of the ore has been stopped over the drive. In the north end the ore consists of quartz-pyrite 6 inches, quartz-arsenopyrite 6 inches, quartz-gossan 12 inches, quartz-arsenopyrite 4 inches, and quartz on the hanging-wall.

The cross-cut has been extended S 53° W to 62 feet and has intersected a 4-inch vein of quartz arsenopyrite at 21 feet, and a 6-inch vein at 43 feet. A little malachite was noted in these and the South Lode. Samples of the ore contained 0.4 and 0.5 per cent tin.

From the foregoing account it will be apparent that a great amount of exploratory work is necessary before an attempt can be made to form a true estimate of the value of this property but the results thus far obtained are such as to warrant expenditure in the opening of these bodies at other points along their courses.

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