

Old Mines on Zeehan Lodes.

The King

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The King

① Location and Access.

The King Mine is only 20 chains from the Zeehan Railway Station with which it is connected by road.

② History

The No 1 Queen (now Montana No 2) and the Silver King were the two first shafts sunk at Zeehan. In December 1888 G. Thureau (Govt Mining Geologist) reports: ①

"The Silver King Co's principal shaft has been sunk about two feet since my last visit (March 1888) and is about 14 feet vertical from the surface"

In all its subsequent history the King mine never had an experienced mine manager. The outstanding personality who carried the mine through its productive stages was a Capt Fisher who was a shallow-water master mariner. Capt Fisher's effort in the design, purchase and erection of a concentrating mill was pathetic in its ineffective outcome.

But by 1900 the Main Shaft was down to 246 feet. Nevertheless the mine closed down in 1902 and has never been reopened.

③ Output and Profit.

No accurate figures are available as to aggregate output. The operations of the Company were spasmodic and haphazard. In addition the Mines Dept records from 1888 to 1898 do not give the production of individual mines.

However, from 1899-1902, 10,000 tons of ore were sold at approximately £8 per ton. Taking into account the halting progress of the mine it seems reasonable to take

① G. Thureau, "Progress Report on Mount Zeehan Silver Lead Lodes" Dec 1888 p 5.

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10,000 tons as representing the period 1888-1898.

On this assumption the output in round numbers would have been:-

Lead 14,000 tons

Silver 500,000 ozs.

There is no information available as to what was the profit made on this ore. The accounts of the Company include the appreciable income from Fahy's Tribute on the South King and thus the operations at the King Mine cannot be analysed as a separate entity.

(4) Geologic Environment.

(a) Country Rocks.

The country rocks are shales and sandstones belonging to the upper portion of the Silurian system as developed in the Tecton district. Some of the beds give a reaction for the presence of calcite but nothing suggestive of even impure limestone is observable at the surface. The beds are on the east-dipping limb of the syncline located to the east of Tecton.

(b) Position Relative to Regional Structural Pattern.

The main King lode is situated between the Oonah and Florence Tear Faults. The southern end of the workings must be very close to the Florence Tear Fault, but the north end of the workings is 1000 feet from the probable position of the Oonah Tear Fault.

(c) The Fractures.

The bearing of the fractures is 332° . The dip is to the westwards at $70^\circ - 80^\circ$.

They thus differ from the general tendency of the lodes in the western portion of Tecton (Montana, Western, Oonah etc) where the dip is easterly.

The old records do not describe the details of the fracture and the workings are not available for inspection, being under water. Nevertheless there is one outstanding characteristic. They are markedly straight as compared with those in the Montana, Western, Oonah, Florence, Queen etc, resembling in this

respect the Spray Stears.

The fracture now occupied by the Main Lode has been proved by mine workings to be continuous over a length of 750 feet. At the northern end on the No 1 level it seems to have bifurcated to two closely spaced parallel fractures. At the south end of Nos 1+3 levels it swings away from its general direction towards the west.

The general behaviour suggests a compression fracture rather than a tension-crack.

⑤ The Lodes.

① Number and Spacing

There are four (4) lodes — Main Lode and Nos 1, 2+3 Lodes. No 1 Lode is 350 feet west of Main Lode; No 2 Lode is 384 west of No 1, and No 3 Lode is 264 west of No 2 Lode. There are thus 4 lodes within a width of 1000 feet.

② Proved Length and Width.

(i) Main Lode.

The proved lengths at the various levels are as follow:-

At No 1 Level: 675 feet

At No 2 Level: 525 feet

At No 3 Level: 675 feet.

The width throughout these lengths cannot be stated in detail. Thureau in 1888 gives the width at 14 feet below the surface as from 5 to 6 feet of "solid lode of ore".^② Waller in 1904 has this to say:^③

"At No 3 level at the south end the lode turns west.

It is here 20 feet wide carrying small quantities of metal right through, with 8 inches of first-class ore on the hanging-wall. The lode is a strong wide formation, and the area which has been exploited has produced a very large amount of ore."

(ii) No 1 Lode.

Penetrated only at No 1 Level. Driven on for a length of 110 feet. Width 3 feet.

② G. Thureau "Progress Report on Mount Zuckan Silver Lead Lodes" 1888 p. 5.

③ G. A. Waller "Report on Zuckan Silver Lead Field" 1904 p. 98.

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(iii) No 2 Lode

width is 7 feet. Has not been driven on.

(iv) No 3 Lode

width is 2'6". Has not been driven on.

(c) Orientation.

The lodes follow the fractures. The mine plan shows the Main Lode as very regular in its orientation. There are only two deviations from the bearing of 332° . One is at 130 feet south of the crosscut at No 3 level. Here the bearing suddenly changes to 360° for a length of 25 feet. The other is at the south end on both Nos 1 + 3 Levels. Here the lode again takes a bearing of 360° & this has been followed 75 feet to the south end of the workings. The lode is unknown beyond that.

(6) The Ore.

(a) Character of Lode Material.

The lode material is essentially siliceous. Rich bands or aggregations of ore occur in a matrix of brecciated shale (which in the lode & its immediate vicinity simulates slate) and sandstone. Replacement of the brecciated material has taken place. The lode not being open to inspection in place cannot be examined to determine the relative importance of replacement and fissure-filling.

(b) Constituent Minerals.

In the Main Lode galena is dominant with sphalerite subordinate. No 1 lode at the only place driven on (110 feet at No 1 level) shows dominant sphalerite. Pyrite is rare.

The dominant gangue mineral is quartz with accessory siderite.

(c) Ore Shoots.

(i) General Characteristics.

Waller states: ⁽⁴⁾

"Almost the whole of the lode-channel is metal-bearing"

"The metal is more abundant than in the case of"

many of the lodes carrying high-grade [i.e. high in Ag content] ore.

The portions of the lode which have been stoped are those carrying the richer concentrations of galena
(ii) Galena Shoots.

- Length stoped at No 1 level: 300 feet
- Length stoped at No 2 level: 250 feet
- Length stoped at No 3 level: 50 feet. (5)

An analysis of the position of these stopes on the longitudinal section shows clearly that the short length stoped at No 3 level was not the outcome of a shoot at the upper levels narrowing in depth. The position of the two small stopes at No 3 level is beyond the downward continuation of the stopes on Nos 1 & 2 levels both to north and south. The only explanation seems to be that sporadic richer portions were looked for, the remainder of the ore being left standing.

(iii) Sphalerite Shoot.

In No 1 lode at No 1 level the leading stope was taken out for a length of 50 feet.

(iv) Grade of Ore Mined

No information is available as to the grade of ore mined. Although it is certain that the mill was inefficient (6) the percentage recovery is not stated. Therefore sampling what tailings remain will only be an approximate indicator.

On one point, however, there is specific information. The galena assayed; - (7)

Pb	Ag
%	ozs
70	25.

Waller in 1904 - 2 years after the mine finally closed down - says: - (8)

" At No 3 level..... most of the lode is standing. A large proportion of this is said to be good seconds, which would pay well to mine, provided the mine were equipped with an efficient concentrating plant"

Examination of ore on the dump shows that the ore is lead-zinc-silver. Zinc was clearly one of the factors which determined the closing down in 1902.

(5) G.A. Waller Report on Zuckor Silver-lead Field 1904 p 98.
 (6) do do do p 97.
 (7) do do do p 98.
 (8) do do do p 98.

(7) Mine Workings.

(a) Adits.

There are no adits the lode outcrop being at the base level of the Zechan Station.

(b) Shaft.

Dimensions 12' x 6'. Collar timber dropped but ground soled and standing. Debris for a few feet at 12 feet below collar.

Depth 250 feet. Water pumped when working 13,200 gallons per hour. (9)

(c) Drives:

- At No 1 Level : 970 feet
- At No 2 Level : 525 feet
- At No 3 Level : 750 feet.

(d) Crosscuts.

- At No 1 Level: Shaft to lode : 130 feet
West crosscut : 905 feet.
On lode : 2 ft. totalling 130 feet
- At No 2 Level: Shaft to lode : 80 feet + 70 feet beyond
On lode : None
- At No 3 Level: Shaft to lode : 63 feet
On lode : 3 ft. totalling 50 feet.

(8) Discussion of Possibilities.

(a) Available Ore.

Waller when discussing the possible reopening of the mine in 1904 says: - (10)

"There is said to be still 75 feet of good ore to the north of the stoped ground at No 1 level. There is still a large quantity of second-class ore standing at No 2 level. There is one block of stoping done above No 3 level, but most of the lode is standing. A large proportion of this is said to be good seconds, which would pay well to mine, provided the mine were equipped with a good concentrating plant. In the south end the lode is 20 feet wide, carrying

(9) J.H. Leung's State Mining Engineer "Zechan Drainage Scheme" 1914

(10) S.A. Waller "Report on Zechan Silver-lead Field" 1904 pp 98+100.

small quantities of metal right through, with 8 inches of first-class ore on the hanging-wall"

(8) Diamond Drilling

The future and stability of the mine depend on the continuance of the lode and values below No 3 level and along the lode both to north and south.

The downward continuation below No 3 level could be tested by diamond-drilling from the surface west of the shaft by vertical bores or bores steeply inclined eastwards. A series of 500 feet holes would prove the character of the lode at 250 feet below No 3 level. The continuity of mineralisation along the 600-700 feet already established justifies exploration by diamond-drill.

It has been pointed out in the earlier part of this report that southwards the lode comes under the influence of the Florence Tear Fault. Whether it resumes on the immediate south side of that fault is unknown. It could be searched for by shallow diamond-drill holes ^{in conjunction with the exploration northwards from the Bell Mine.}

There is, however, some evidence that the lode continues northwards. Galena has been found in a paddock behind the Federal Hotel on the line of strike of the Main lode. There is a length of 1000 feet in this vicinity (i.e. until the Dorak Tear Fault is reached which could be tested by short diamond-drill holes.)

Short diamond-drill holes would also test the longitudinal extent and general character of Nos 1, 2 + 3 lodes. These lodes are virgin but promising.

(9) Recommendations.

- (a) Clear block in Main Shaft and unwater
- (b) Sample all backs and faces
- (c) Inspect and sample stope filling - if any.
- (d) Diamond drill for downward continuation either from surface or from fanned holes from the West Crosscut at No 1 level.

C. Rogers Hills
30th January 1947.