UR1951/77-80

REPORT ON MINING IN THE UPPER FORTH VALLEY

The main mine in the Upper Forth Area at present is the Mt. Pelion Wolfram Mine. It is held by Bloomfield, Knight and Martin and is not being worked. The expenditure covenant is evaded pending survey of the mineral lease.

The main vein is exposed in the steep eastern side of the Forth Valley above the flood plain near Reid Creek which is about ½ of a mile south of Oakleigh Creek.

The vein strikes north-south and dips 76° to 092. It was measured in several places to give widths of 8, 13 and 15 inches but it branches and joins in many places giving widths such as 9 and 4 inches. The average width would perhaps be about 12 inches, and certainly not less than 9. Thomson estimates 14".

The economic minerals are wolfram and cassiterite, but McIntosh Reid (1919) also lists molybdemite, arsenopyrite, chalcopyrite and pyrite which if they do occur are certainly very minor constituents of the vein material. The gangue is quartz and mica. The quartz is milky but there are many cavities and vughs lined with coarse crystalline quartz. Coarse tin and mica (gilbertite) occur with the crystalline quartz in these cavities and at other places scattered through the lode. The wolfram occurs in blebs and bunches scattered through the quartz. The nature of its occurrence makes sampling difficult. Channel samples and chip samples are valueless the only valid method of assessing the grade is from production results over the parcels extracted.

The vein is opened by an adit 120-30 feet long and about 500 feet of trenching on the surface. The surface trenching is on the hillside above the adit and reached a height of about 300 feet above the drive. The vein exposed at the end of the trenching is still at full width and is mineralised to the same extent. It can reasonably be supposed to continue.

A little ore has been broken from the vein at the surface and it has been extracted from the adit for about 40 feet by underhand stoping. About 400 sq. feet of vein material has been taken from the stope and this ore was stated by Rowe to be worth about £2000.

If the 400 sq. feet of vein extracted yielded £2000 worth of concentrates then the ore standing in the backs above the adit is worth about £33,000, or if the drive were extended to say 500 feet the ore above is worth about £375,000. The value of the ore is probably great but is not expected to be anywhere near this figure.

The grade of the lode is not properly determined. Thomson (Nov.1950) estimates the grade as 1.5%WO3 on production figures but according to our records his figures are incomplete.

McIntosh Reid estimates the grade of the ore by analyses of samples as 4.6% WO3 and .3%S. Hitchcocks report states the estimate of 5%WO3 to be reliable but this is based on sampling also. It is considered that sampling is not a reliable method of assessing the grade of ore for this type of deposit.

In his assessment of the value of the reserves Thomson gives the average width of the vein as 14" and with a grade of 1.5%WO_3 and 200/- stg. as the price he estimates £135,000 which at the current rate for wolfram (545/- to 560/- stg.) is £367,000.

Our records give the production as : -

Quarter Ending	Quantity Produced Tons	Metal Content Ins. WO_3	Value Estg.	Value £A.	Tin Content Tons	Value £A.	Gold Content f. ozs.	Value £A.
June 1944	.164	.113	57	62	.051	15		
Sept.1944	.739	.435	218	234				
Dec.1944	1.211	.772	386	419				
March.1945	.635	.410	205	235	.097	29		
Sept.1947					.081	35		
Dec.1947	.437	.240	153	167	.021	9		
March.1948	.819	.531	353	405	.059	30		
June,1948	.337	.237	154	187	some	?		
Sept.1948	.644	.451	248	347	some	?		
Dec.1948	.159	.106	64	67			13.25	114
TOTALS	5.145	3.295	£1838	£2123	approx. .550	Approx. £250	13.25	£114

The ore removed appears to be : -

From the drive - 68 Tons
From the under hand stope - 27½ "
From the surface workings - 200 " at least

but the material from the drive was extracted prior to 1919 and may not have been included in the production from 1944-48.

If it is included the grade is about 1.1% WO_3 whereas if this material had been previously treated the grade worked out on 227½ tons (say 250 for margin) is 1.3% WO_3. Because of the very inefficient method used for refining the ore, which was broken by hand, sluiced and jugged in a primitive home made jig, the recovery was probably as low as 50%. Thomsons estimated grade of 1.5% WO_3 is then almost certainly an underestimate and a more probable grade would be 1.7 - 1.8% WO_3.

The impression simply by inspection was about 1 - 2% Wolfram.

Roughly the shape of the reserve ore block is triangular at least 500 feet long and about 300 feet high.

Reserves then $\frac{500 \times 300}{2} \times 1\text{ft.} \times \frac{62.5 \times 2.65}{2240} = 5{,}540$ tons

assuming 12" average width of vein and 2,65 as its density.

This is the total quantity available of which about 5,000 tons would be mineable after allowing for stope pillars etc.

If we also assume an 80% mill recovery and put the grade at 1.7% WO_3 at the current price of 545/- to 560/- stg. per unit the reserve is worth

$5{,}000 \times \frac{80}{100} \times 1.7 \times \frac{550}{20}$ = £187,500 stg.

or £234,000 A.

Even if the ore produced gave 1.7% of concentrates instead of 1.7% WO_3 the value is still £121,500 stg. or £151,000 A.

Offset against this are the following costs : -

Extending the drive from 117 to 500 ft.	-	£3,900
Repairs to the road	- at least	2,000
Mill erection	- at least	10,000
Mining at 40/- per ton & Mullock in ration 2:1 i.e. to make a 3ft. stope	- 120/- per ton	30,000
Development at	40/ per ton	10,000
Milling at	15/- per ton	3,750
Power, Housing etc.		10,000
		£69,650

This sum still leaves at least £80,000 as a comfortable margin to allow for overestimation of the metal content or underestimation of the costs.

To deliberately underestimate the ore to the lowest value by assuming 9" average vein width and only 250ft. of backs at the end of 500ft. of driving we get reserves of 3,475 tons which at say 1% WO_3 and 80% mill recovery are still worth £66,000 which still just about covers the cost of mining.

The first logical step in opening the mine is to continue the drive to 500ft. and rise to the surface thus proving the ore. The ore extracted would give an accurate assessment of the grade and indicate the scale of milling and mining operations necessary for profitable exploitation.

This mine is capable of profitable production. It is recommended that whatever steps are possible to get it in operation are immediately taken.

John Elliston,
Geologist.

The Department of Mines,
HOBART.

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