INTERPRETATION OF LEVELS, BORING ETC. WITH RELATION TO FAULTING OF TASMANITE SHALE BETWEEN LATROBE & RAILTON

With the object of ascertaining the amount of faulting in parts of the Tasmanite shale seam, a series of relative heights were taken by means of a standard level along the surface between the existing bore holes, shafts, quarries, adits etc., over three separate areas in which the shale had been proved to exist between Latrobe and Railton.

(1) North-East of Goliath and Tasmanite Mines (Area 11)

The bottom of shale outcrop at entrance to the central adit, north of main east-west fault at Tasmanite Mine, was selected as datum for levels. The levels were extended to all bore holes in which shale had been penetrated, with the exception of the east-west line of bores along south boundary of 40 ac. 2 rds. 17 pchs., S. Dyson, Pur., recently levelled by Mr. J.B. Scott (Secretary for Mines).

Surveys made of the position of some of the bores showed that Bores 1 to 5 (1933), D.D. No.3 M, M.V. No. A. and M.V. No. B. were incorrectly placed on the bore plan, and these were adjusted.

(a) Area North of Tasmanite Mine

This area is limited to the west by a fault line having a downthrow of 253 feet, to the north by a basalt flow and diabase dyke, and to the south by a fault with a displacement of 10 feet. The eastern limits of the block have not been determined.

The area proved by boring covers 40 acres which, with a 5 feet shale seam, and allowing 25% for losses, gives a reserve of 281, 250 tons of shale. Extracting at the rate of 65 tons per day, the life of the mine would be between 14 and 15 years.

While the boring is not sufficiently close to give accurate results, it is enough to indicate that the shale has a general dip, at a low angle, ranging from five to nine degrees in a north-westerly direction, varying from 300° to 344°.

Unfortunately, the true dip of the shale seam could not be checked in the datum adit, as the exposure was very limited, owing to inaccessibility of the workings; therefore, it was necessary to accept the calculated dip which agreed, in amount anyway, with that recorded in Report of Tasmanian Shale Oil Investigation Committee (Mineral Resources No.8 Vo. 11).

Two sections were prepared from calculations of the true dip (direction and amount) from a series of triangles, three points of intersection with shale seam, using:-

1. Outcrop in Central Adit - No.4 Bore (1933) - D.D. No.3M Bore

2.   "   "   "   "   - No.5 "   "   - "   "   "

3.   "   "   "   "   -No. 3 "   "   - "   No.5 Bore (1933)

4.   "   "   "   "   -No. 4 "   "   - "   "   "

5. D.D. No.3 M Bore   -No.5   "   "   - No.3 Bore (1933)

6. No.5 Bore (1933) Adit - No.3 Bore (1933) - No.2 Bore (1933)

7. D.D. No.3M Bore   "   - No.4 "   "   - No.3 "   "

        The first, a roughly north-south section from the central adit to Bore No. 3 (1933), passing approximately 27 feet east of Bore D.D. No.3 M, shows a displacement of at least 30 feet.

        The second, almost east-west, from Bore No.4 (1933) to No.5 (1933) passing 80 feet south of No.3 (1933) indicates a displacement of approximately 13 feet.

        To obtain more reliable information it will be necessary to undertake more drilling. The best location for such drilling would be lines along the strike and dip of the shale seam, namely, north-east and north-west. It is suggested, therefore, that if further boring be undertaken, the first bore be put down either to the north-west or north-east of the central adit, at a distance of approximately five chains.

(2) North China Flat (Area V)

        This is situated in the north-west of abandoned mineral section 6641/M, previously held by Railton-Latrobe Shale Oil Company N.L.

        A line of levels between the shafts and bores along Line B was extended to the quarry, eleven chains to the south-east of No.3 Bore, and a survey connection made from Line B to the quarry. The datum used for levels was top of shale seam at south face of quarry.

        Two sections were drawn: 1. Along a nearly north and south line (approximately along the general dip) from south face of quarry through north-west end of open cut and No.1 Shaft to No.4 Shaft, and passing within 92 feet of No.5 Bore. This disclosed a maximum displacement of 66 feet between north-west end of open cut and No.1 Shaft. 11. North-easterly along Line B connecting No.5 Shaft, No.2 Shaft, No.2 Bore, No.3 Bore, No.5 Bore and No.4 Shaft. A displacement of 13 feet is indicated between No.2 Shaft and No.2 Bore, and another more serious displacement ranging from 53 feet to 73 feet is shown between No.3 Bore and No.5 Bore.

        The test holes and quarries are too unevenly spaced to give precise information but calculations of the true dip on the three point intersection theory indicates that the shale seam, over the greater portion of the area, has a general dip ranging from 2° to 8° in a northerly direction and bearing from 2° to 12½°. A large apparent variation is disclosed in the faulted block between No.3 Bore and No.4 Shaft where the calculations indicate an angle of dip up to 30° and direction of dip 63½°.

        The triangles adopted for these calculations were:-

1. South Face of Quarry - West end Open Cut - East & Open Cut

2.   "   "   "   "   - No.2 Bore - No.5 Shaft

3.   "   "   "   "   - "   "   - No.3 Bore

4.   "   "   "   "   - East end Open Cut - No.3 Bore

5. No.1 Shaft   - No.5 Bore - No.4 Shaft

6. No.3 Bore   - No.5 Bore - East end Open Cut.

Further test holes are desirable to prove the nature of the displacements since, from the information now available, these may occur either as small step faulting or as larger fault lines.

In this area the shale may be considered as partly proved over an area of 27 acres containing 153,563 tons (4 feet seam), giving a life of 8 years.

(3) South China Flat (Area V)

This area occurs in the south-eastern part of Special Mineral Lease 6641/M of 699 acres, near south boundary of 143¼ acres, H. Wells Pur.

C line of shafts could not be definitely located but level lines (datum = top of shale in open cut) and connecting surveys were made between a small open cut, 3 chains south-westerly to Richards' Quarry, and thence eleven chains west-north-westerly to a recent shaft. These being the only openings which can now be said to have determined the shale.

The area enclosed by these openings is $\frac{1}{2}$ an acre in extent and this is calculated to contain 15,000 tons of shale, or allowing 25% loss in mining 11,250 which, on the 65 tons per day basis, gives a life of only seven months. Extensions of the seam may be expected for a considerable distance to the north and for a short distance to the west of the area.

Immediately to the east the shale has been eroded, and southerly it appears to be limited by a vertical east-west fault disclosed in south face of Richards' Quarry.

Three point intersection calculations indicate that the shale seam dips at an angle of $1\frac{1}{2}^{0}$ along a bearing of 30^{0}. A section drawn approximately along the dip between Richards' Quarry and the open cut suggests that the shale dips on an even grade without serious disturbance.

To prove a larger area of shale in this vicinity it is recommended that a series of test holes be sunk along north-east trending lines to the north of a line between Richards' Quarry and the new shaft.

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