REPORT

on

PROPOSED DRILLING OF THE SHALE FIELD IN VICINITY OF THE TASMANITE AND GOLIATH MINES

Tasmanite shale outcrops in this field at two places.

1. In the south-eastern portion where it was also opened up in the mine workings of the Railton-Latrobe and later the Tasmanite Company.

2. In the western portion where it was opened up in the Goliath Company's mine workings.

Its extent over the remainder of the field is suggested generally by the geological structure but has to be proved by either bore holes or shafts. Up till this year the total number of bore-holes and shafts (exclusive of the shallow shafts and hand bores near the Tasmanite workings) put down to test the extension of the shale was 11, of which 4 cut the shale; 3 were not sunk deep enough; the results of 2 are not definitely known; 1 was outside the shale field; and one was in a basalt dyke. During the past few months, six bore holes have been put down with the departmental plant of which 2 cut the shale, 2 are probably below the shale, 1 was not sunk deep enough, and 1 was in a basalt dyke.

Besides proving the extent of the shale, boring is necessary to outline the different blocks of shale bounded by major faults &c. This information is necessary to determine the amount of ground that can be mined from the present openings and what other adits or shafts will be required to mine the shale in the remainder of the fields.

The above boring has given valuable information as to the extent of the shale, presence and location of igneous dykes, and the major faults, but particularly as regards the faults the information is not sufficiently complete.

The present position is generally outlined in the following descriptions:-

Faulting: The shale seam in the Goliath workings has a strike from N.E. to S.W. and dips to the north west at 1 in 10. The seam in Nos. 2 and 4 (Boundary) tunnels at the Tasmanite mine has an east west strike and dips north about 1 in 10, and is 38'6" above the shale in the Goliath New tunnel. These facts point to at least one main fault between the two workings. For the purposes of description the block extenting north from the Tasmanite workings will be termed Block A, and that near the Goliath workings Block B.

The extension of the shale in block A has been by D.D. Bore No. 3M, where the shale was cut at 134' - 139' which is approximately the estimated depth and precludes any major faulting between the bore and the workings. The nearby No.4 shaft of the Tasmanian Shale and Oil Co. was sunk to 83 feet and was not deep enough to cut the shale. The C.D. Bore No. 6M (just completed) would have further proved the northern extension of the seam but it encountered a basalt

dyke. Still further north are the T.C. Nos.2 and 1 bores. The former was sunk to a depth not sufficient to cut the shale, while the latter is stated to have cut the shale at 256 feet. This depth is less by about 120' than that expected if the dip of 1 in 10 continues from the D.D. No. 3 hole. Whether this is due to a less dip and minor faults, or a major fault of about 100 feet dip throw cannot be determined.

The extension of the shale from the Goliath workings has been proved in a northerly direction by M.V. Nos. A & B bores, and in an easterly direction by C.D. No. 2M and 3M bores. The M.V. No. A bore cut the shale at 49'6" and the M.V. No.B bore at 104'. These agree generally with the extension of the seam without any major faulting. It is not known definitely whether the Tasmanian Cement Co.'s shaft reached shale or not but it is so close to M.V. No.B bore that it would be somewhat exceptional if it did not reach shale. Another bore T.C. No.3 exists 7 chains north of this shaft, but it is not known whether it cut the shale or not. Another (T.C. No.4) bore with a depth of 75' occurs near the Latrobe road, but again the results are not known, and further this bore may be outside Block B.

The extension to the east has been recently proved by C.D. Nos. 2M and 3M bores, but the C.D. Nos. 1M and 4M failed to locate shale.

The outcrops of the shale along the Mersey River and the altitude and occurrence of the shale on the west side of a river suggested a major fault as bounding the west side of block B and separating it, in part, from Block C. The direction of this fault is from N.N.W. to S.S.E. and the downthrow would be to the west some 50' - 100' in amount.

As regards the fault between blocks A and B the evidence as to direction is rather meagre, but the presence of shale in C.D. No. 2M and C.D. No. 3M bores and its absence in C.D. No. 1M and C.D. No.4M bores suggests a fault with a general strike from N.N.W. to S.S.E. (The failure of C.D. No.4M bore to locate shale may be due to the shale outcropping between the C.D. Nos. 3M and 4M bores, but the evidence of C.D. No.4M bore appears to prove definitely that the fault exists if the shale retains its N.W. or Northerly dip). Such a direction is also necessary so that the Tasmanite working and the D.D. No. 3M bore are in block A and the M.V. No.B bore is in block B. This direction also agrees with the general one for the faults in this field. The downthrow is to the east and its magnitude is possibly in the vicinity of 150 feet.

The minor faulting as revealed by the mine workings are shown on the attached plan.

Extent of Shale. The "partly proved" area of shale and its "possible extension" are shown on the attached plan. The whole of these areas require drilling in order to prove that the shale extends under them. Further extensons are limited by the geological structure, but particular attention should be given to following the shale to the north where its extension is not definitely limited.

Igneous Dykes and Flows. Basalt occupies the surface around and to the east of the old Tasmanite retorting plant and the level nature of the surface suggests that it forms part of a flow. However a dyke is seen extending below this flow in the quarry south of the retorting plant. The continuation of this dyke to the north or east had not been previously traced, but the locality of basalt in C.D. No. 6M bore and the presence of basaltic soil on the old Deloraine road near the S.E. corner of M. Gray's 25 acre block, suggests its continuation in an E.N.E. direction.

The small hill of basalt to the N.W. of the Tasmanite mine is either a portion of the above flow or a small plug.

A diabase dyke has been shown on the N.W. side of the basalt with a N.E. - S.W. trend. In the vicinity of the Goliath Mine, this dyke appears to have been mapped as the result of the occurrence of numerous large blocks of diabase. These blocks are mainly associated with a pebbly and clayey soil quite unlike a diabase soil, and moreover the bores (C.D. Nos. 4M, 5M and 6M) and exposures on old Deloraine road prove the presence of clay beds with numerous pebbles. Blocks of quartzite also occur in this region and it seems possible that the diabase boulders as well as the quartzite ones were contained in these clay deposits. Confirmation is given to this by the fact that the platey jointing in the diabase blocks is not regular in direction. It is therefore possible that the diabase dyke does not exist in this vicinity.

Conclusions and Recommendations: The above descriptions show that a considerable amount of boring is still necessary to prove the extent and to locate the major faults in this shale field. A plan of proposed boreholes is shown on the attached plan and is designed to prove the extent of the shale. As this boring proceeded it would give much of the information required to locate the major faults, but additional holes sited as a result of the information obtained, might have to be put down to more definitely locate the faults.

The exact order of carrying out the drilling depends upon circumstances, especially those caused by the operations of the shale oil companies. Thus if the Tasmanite Co. intends to continue mining from the Goliath Mine, the holes to the east and north of these workings should be put down first. The same applies if working is contemplated from the Tasmanite mine or any other locality.

The scheme outlined is based upon proving the extent of the shale in the whole of the field, without particular reference to whether the land or leases is controlled by the Tasmanite Shale Oil Co. If it is desired only to bore the land and leases controlled by this company then some slight modification might be necessary especially near the boundaries of the property. The scheme agrees generally with that of the Tasmanite Shale Oil Co. for lease 6641/M and the three private blocks to the north.

In order to prove the extent of the shale over the whole of Area II, the scheme includes 51 bore-holes spaced at roughly 10 chains intervals and arranged so as to avoid igneous dykes and faults as far as these are known. If these holes prove that the shale seam is regular in the blocks between the faults, then probably no more boring would be necessary. If however, there is still doubt as

to the regular continuation of the seam then further boring would be necessary particularly in those localities where doubt exists. If closer boring than the above were found to be generally necessary then the holes in the centre of the above squares could be put down. This would give a further 47 holes.

On lease 6641/M (256 acre block) and the three private blocks, the scheme includes 16 holes arranged approximately at 10 chain intervals. The same remarks as to further holes and closer spacing apply as above. The number of holes in the centre of the squares would be 11.

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