

IV

GEOLOGY(1) Summary of Previous WorkPetroleum Indications

No oil or gas had been recovered from the Bass Basin. Prior to drilling Bass-3 Esso had drilled two dry stratigraphic tests in the Bass Basin; one to 7717 feet near the basin centre, and one to 5910 feet near the northeastern flank of the basin. Minor background gas readings were recorded by the mud logging unit during the drilling of both Esso Bass-1 and Bass-2 wells. No seeps or other occurrences of hydrocarbons are known from the few Tertiary outcrops around the periphery of the Bass Basin. There have however been consistent reports of specimens of coastal bitumen stranding along the South Australian and Victorian coasts since white man's early occupation. It is believed by some geologists that these may represent bonafide oil seeps from submarine Tertiary rocks. The hydrocarbon show logged from 6739 to 6744 feet in the Bass-3 is the first valid show in the basin.

Existing Geophysical Data

The following is a summary of geophysical surveys completed by both Esso and Hematite -

Hematite Petroleum

- a) Aeromagnetic Survey, completed in 1961.
- b) 1765 miles of single fold coverage completed in 1963.

Esso

- a) Esso Bass Survey
182 miles of 6 fold C.D.P.
37 miles of single fold.
3 velocity and refraction profiles completed 10-5-65.
- b) Esso King Island East Survey
252 miles 6 fold C.D.P. completed 25-10-65.
- c) Esso Bass Strait Survey
395 miles 6 fold C.D.P.
1115 single fold coverage completed 13-10-65.

Existing Geological Work

As the Bass Basin lies almost entirely under the continental shelf, direct geological work has been limited to studies of cores, samples and electric logs of the Bass-1 and Bass-2 wells. The major geological interpretations, therefore, have been based on seismic control in conjunction with geological information from the adjacent Gippsland and Otway Basins.

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Regional & Historical Geology

The Bass Basin lies at the southern end of the Paleozoic Tasman Geosyncline. The Paleozoic sequence probably exceeds 25,000 feet in thickness on the Mornington Peninsula on the northern side of the basin (Keble, 1950). The strata range in age from Cambrian through Carboniferous and are made up of a complexity of folded, faulted and intruded marine to non-marine sedimentary, metamorphic, extrusive and intrusive igneous rocks. In Tasmania similar complex rocks, tens of thousands of feet thick, occur along with more than 25,000 feet of pre-Cambrian sedimentary and metamorphic rocks. It is logical to expect the Bass Basin to be underlain by any of these rocks. They would extend from shallow depths at the basin edge, and downwards from 12,000 feet in its deepest part.