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part 1

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DEPTH TO MAGNETIC BASEMENT
IN THE
CROCODILE ROCK, SQUID, AND STONEY HEAD SURVEYS OF THE
BASS BASIN, SOUTHERN AUSTRALIA
FOR
WEAVER OIL AND GAS CORPORATION

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For the purpose of this report, the survey is treated as 2 study areas, the Crocodile Rock area as one, and the Squid and Stoney Head Survey grouped as the South Bass Basin area.

The two interpretation areas, Crocodile Rock and the South Bass Basin, are located within the Bass Strait of Southern Australia between the Otway Basin to the west and the Gippsland Basin to the east. The Crocodile Rock portion of the study occupies the area between $144^{\circ}15'$ to $145^{\circ}15'$ east longitude and $39^{\circ}10'$ to $39^{\circ}35'$ south latitude. The somewhat larger area to the immediate southeast, the South Bass Basin, is located within the boundaries $145^{\circ}45'$ to $147^{\circ}00'$ east longitude and $39^{\circ}55'$ to $41^{\circ}00'$ south latitude. While up to four and one half kilometers of sediment have been described in the neighboring basins, the Crocodile Rock and South Bass Basin lie over an uplifted basement complex tying Tasmania to Australia, the margin of which may be roughly defined at the depositional boundary of the Eocene (Beddoes, 1973).

The magnetic interpretation of the Crocodile Rock area depicts what appears to be an eastward sloping basement surface ranging in depth below sea level from approximately 600 meters in the west to 2300 meters in the eastern part of the area. Four rather broad, possibly related igneous bodies are interpreted to cross the area along a northeasterly trend. Ranging in width from approximately 2 km to 9 km, the igneous rocks are interpreted to be intrusive in nature and are delineated by consistent calculated depth solutions along the major magnetic highs that cross the area. Two or more of the bodies may also be in fault contact with the surrounding lesser magnetic rock. Two small possible faults are denoted on the interpretation map with the sense of throw noted as normal and eastwardly downthrown in both cases.

In the South Bass Basin portion of the survey, to the southeast, three different types of sources seem to be responsible for the magnetic pattern. Very broad basement anomalies suggest basement depths at approximately 4500 meters in the northwestern portion where one documented well depth reached 3049 meters at Pelican II before drilling was stopped due to geopressure (Beddoes, 1973).

In certain areas, bracketed depth values from 7500 meters to 10,000 meters are denoted as intrabasement features. It is conceivable, however, that basement could reach those depths. Questionable depth values at

approximately 2500 meters below sea level are interpreted as basement in the central portion of the map area, but may represent shallow, weakly magnetic volcanics instead. The broad anomaly pattern on the total intensity map indicates that it is likely that basement is actually deeper.

In the south central part of the South Bass Basin, an area of probable, thin, shallow volcanic cover has been roughly outlined at depths on the order of 1000 meters below sea level. Scarcity of data in that area prevents a prediction of the extent of the cover. A massive igneous body similar to the ones interpreted in the Crocodile Rock area is defined in the southwestern corner of the survey at an average depth of approximately 1500 meters below sea level. The increased magnitude of the associated anomalies allows distinction between this and the probable sheet-like volcanic sources. Basement depths are difficult to discern in the south and southeastern parts of the area due to shallow source masking but appear to occur at approximately 4500 meters as in the northwestern portion and may reach a depth of 7500 meters below sea level.

In summary, basement depths in the Crocodile Rock area seem to indicate an eastward sloping surface from 600 to 2300 meters below sea level, possibly comprised by an intrusive igneous complex with local eastwardly downthrown normal faulting.

Basement appears to deepen to the southeast in the South Bass Basin to depths of 4500 meters below sea level with possible depths in certain areas to 10,000 meters.

Two types of igneous sources are interpreted in the South Bass Basin. Fairly extensive thin, shallow volcanics probably cover large areas at a depth of approximately 1000 meters and a more massive intrusive igneous source of uncertain extent occurs in the southwestern portion of the area. Others may be present.

Respectfully submitted,

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