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ESSO BASS-2

WELL SUMMARY

By

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Geological Cross – Section A-B. Through Esso Bass, -2  
Showing Eocene & Oligocene Sand Developments

OR-0333C

Esso Exploration Australia, Inc.,  
Sydney, N.S.W., Australia.  
June 23, 1966.

ESSO BASS-2WELL SUMMARY

Type of Well: Wildcat (stratigraphic drilling subsidy application)

Purpose of Well: Test a seismic anticlinal closure which is reflected in strata from Pre-Tertiary (?) to Oligocene in age. Closures evident from seismic were 100 ft on the top of the Oligocene, 200 ft. on the top of the Eocene and 250+ ft. on the interpreted Paleocene - Upper Cretaceous ? unconformity.

Well Statistics:

Status: Dry and abandoned.

Location: Latitude: 39° 53' 09" S  
Longitude: 146° 18' 15" E

Water Depth: 280 feet.

Spudded: April 14, 1966.

Abandoned: May 25, 1966.

Total Depth: 5910 feet.

Casing: 30" at 403'  
20" at 817'  
15-3/8" at 2043'

Plugs: 530 to 530 feet  
2200 to 1900 feet  
3400 to 3200 feet  
3900 to 3700 feet

Coring: Ten conventional cores totalling 233' and 110 feet recovered. Fifteen sidewall cores were cut and fourteen recovered.

Mud Logging: Core Laboratories from 817' to 5910'

Electric Logging: IES, SGRC, MLLC, CDM from 817' to 5910'

Hydrocarbons: No significant shows.

Testing: None.

GeologyStratigraphy:

Stratigraphic Table - The succession as shown below is based on lithology, paleontology, and log analysis. These units can be tied to seismic marker reflections which can be traced across the basin. At this stage, no formation names have been applied to these units.

STRATIGRAPHIC TABLE

Unit	Age	Top	Bottom	Thickness
Calcareenite (and some quartzose sand)	Upper & Mid Miocene and Younger	267	2164	1897
Calcareous Mudstone	Middle & Lower Miocene	2164	2986	822
Mudstone, Siltstone and Sandstone	Oligocene	2986	3618	632
Argillaceous Siltstone	Eocene	3618	3838	877
Sandstone, Siltstone and Coal	Eocene	3838	4495	657
Sandstone, Siltstone and Coal	Paleocene	4495	5511	1016
Trachyte (volcanics)	Lower Cretaceous ?	5511	5767	256
Mudstone (Metamorphosed)	Siluro Devonian (?)	<del>5920</del> 5767	-	243+

Miocene

850-2164 Coarse Calcareenite: (or Bryozoan biomierudite), light grey, fine to very coarse grained: made up largely of assorted calcareous fossil debris (bryozoa, echinoids, pelecypods or lamellibranch and foraminifera). The rock is loosely consolidated. Trace of glauconite, pyrite and very minor carbonaceous flecks and grains. The interval from 1400-2164 contains varying amounts of quartzose sand grains, which are generally fine grained, sub angular to well rounded; these grains are clear, white, light grey, grey and in some cases translucent. A minor amount of marly or micritic matrix is evident throughout the interval.

2164-2986 Calcareous Mudstone: light grey-green and grey-green, very soft, and plastic micromicaceous in part, with very sparse carbonaceous flecks. The interval is quite fossiliferous pelecypod fragments. It contains relatively sparse calcareous pyrite nodules. The bottom twenty feet of this interval contains abundant grains of glauconite.

Oligocene

2986-3048 Silty Sandstone: light olive grey, very fine-medium grained, very argillaceous, calcareous, soft friable, very glauconitic, pyrite, as fine euhedral crystals and pyritised fossil fragments and worm impressions; largely calcareous grains and minor quartzose material; fossiliferous; including foraminifera, bryozoa and pelecypods. Becomes more argillaceous and silty towards bottom of interval; thin brown-grey argillaceous lenses to  $\frac{1}{2}$ " thick parallel to bedding. No apparent dip. No effective porosity or permeability.

3048-3290 Silty Mudstone: light olive grey, fairly soft, plastic, waxy, micromicaceous, calcareous and pyritic; the pyrite occurs finely disseminated and as pyritised fossil fragments. Contains fossils as in the above interval. The interval grades in part to argillaceous siltstone.

3290-3618

Silty Sandstone: grey and buff, fine and medium grained, angular to rounded, fairly well sorted, (quartzose), very tough and compact, dolomitic, and in part calcareous cement. Abundant grains of glauconite, tuffaceous and much finely disseminated pyrite. Sparsely dolomitized fossil fragments to 1/8" thick (foraminifera) (Minor mineral fluorescence, dull yellow).

Sandstone: brown grey, mottled, fine to medium grained, angular to rounded, fairly well sorted, (quartzose), very loose and unconsolidated. An undolomitized version of the above sandstone. Argillaceous and tuffaceous matrix, with fairly abundant clear mica flakes, approximately .2 mm across. Contains sparse foraminifera. Too soft for core analysis. This interval grades in part to siltstone.

Eocene

3618-3838

Very argillaceous Siltstone: chocolate brown-grey, moderately well compacted, fine irregular banded appearance in hand specimen and massive. Contains much pyrite, finely disseminated, as discreet lense-like nodules to 1/16" thick, pyritised foraminiferal fragments. Lenses of very fine grained pyritic sandstone to 1/4" thick. Occasional quartz sand grains, fine-medium size range, argillaceous, micaceous and fairly abundant flecks of clear mica to 1/3 mm across. Non calcareous, much fine fossiliferous hash locally (dolomitized). Non carbonaceous, no dip, no hydrocarbon odour, no fluorescence, no cut.

Dolomitic Siltstone: buff-orange brown grey, very hard, well cemented, much pyrite, finely disseminated and in irregular nodules to 3/4" long, abundant fine pyritised fossiliferous fragments (foraminifera). Interval is a dolomitic version of the above siltstone, and is in part not dolomitized. One fragment with 1/4" medium crystalline buff dolomite veinlet cutting parallel to axis of core.

3838-4495

Sandstone: light grey, grey with grey-brown, fine to coarse to granule size range, generally poorly sorted, angular to sub rounded grains, in part the interval is pyritic and carbonaceous and locally contains a white kaolinitic matrix; tight in part, has a bright yellow mineral fluorescence, but none of this is due to hydrocarbon content.

Carbonaceous Sandy Siltstone: dark brown grey-streaked black, very tough and well compacted, contains a superabundance of carbonaceous plant remains, elongate willow-like leaves (Eucalyptus ?) and stem-like vascular remains. Very micaceous with clear crystals mica to an average 1.5 mm across; sand occurs in elongate lenses and disseminated throughout, sand content is quartzose in the fine-medium range, and angular-sub angular. The matrix is kaolinitic, argillaceous, finely carbonaceous. Trace pyrite. Rock has an irregular streaked and lensed appearance parallel to bedding; coaly streaks to 1/4" thick, no fluorescence, no cut, very strong hydrogen sulphide odour. No apparent dip.

Minor Argillaceous Siltstone: light brown-grey-buff, bentonitic (tuffaceous ?), well compacted, massive, abundant flecks clear mica, very sparse thin carbonaceous streaks, very sparse quartz sand grains (fine-medium grained). Fine carbonaceous flecks in residue, non calcareous, strong H<sub>2</sub>S odour from freshly broken surfaces, mineral fluorescence, no hydrocarbon fluorescence, no cut. Occasional carbonaceous streaks approximately on bedding surface suggest grass-like plant remains. Contact gradual with underlying interval.

Paleocene

4495-5511 Sandstone: light grey and grey, from very fine to coarse grained, but largely in the fine and medium size range, and sorting is generally poor. The degree of rounding varies from angular to well rounded and there is generally an argillaceous (kaolinitic) matrix. The interval contains many thin discontinuous shaly and carbonaceous laminae. It is slightly pyritic and occasionally contains mica flakes in the matrix.

The above grades to sandy siltstone locally, which is light grey, argillaceous, sandy, and occasionally very slightly calcareous. The siltstone contains thin carbonaceous and micaceous laminae. It is generally quite tight. Both the sandstone and siltstone are locally dolomitized. The interval contains a few black coal beds which range in thickness to 5 feet, and minor shale: medium grey, carbonaceous, micromicaceous and occasionally slightly silty.

Lower Cretaceous (?)

5511-5670 Altered Volcanic Rock: (Trachyte), varicoloured, brownish grey, greenish blue, tan and grey blue and green. In part quite soft, and also fairly well indurated. Contains soft bands of greenish blue (chloritic ?) material and brownish clay-like laminae. Not considered to be bedded.

5670-5767 Relatively Unaltered Volcanic Rock: blue grey and green, fairly hard, microcrystalline in part. Amorphous vein quartz was noted locally throughout this interval and some tuffaceous like soft, light tan coloured material.

Lower Palaeozoic ?

5767-5910 Argillite: (metamorphosed tuffaceous ? mudstone) medium olive grey and bluish grey, hard and dense, faintly banded. Highly fractured with vertical fractures filled by soft white clay mineral and pyrite. The white clay mineral also occurs along bedding planes. Pyrite also occurs finely disseminated throughout the rock.

Paleontology Micropaleontology done by D.J. Taylor of the Victorian Mines Department. Results summarised below:

<u>Depth</u>	<u>Zonule Classification</u> (samples fouled above 2200)	<u>Age</u>
? -2200	D	Middle Miocene
2200-2505	E	Middle Miocene
2505-3035	F, G & H	Lower Miocene
3035-3600	I & J	Oligocene
3600-3828	K	Upper Eocene

Palynology

Palynologic age determinations were done by Dr. M. Dettmann of the University of Queensland and J. Douglas of the Victorian Mines Department. The results are summarised below:

Dr. Dettmann

<u>Core No.</u>	<u>Depth</u>	<u>Age</u>
4	3814-3816	Eocene
7	(4740-4762)	Middle Paleocene
8	(5062-5092)	Middle Paleocene

J. Douglas

<u>Core No.</u>	<u>Depth</u>	<u>Age</u>
5	(4130-4160)	Lower Tertiary

Conclusions:

There is a definite sandstone build up going from EB-1 north-easterly toward EB-2. This facies change from shale to sand is not a reflector and is not mappable by seismic as the seismic appears to be following time lines and not the sand-shale interface. Therefore it is possible to map a closure seismically following time lines that may be effectively eliminated by climbing sand facies. The seismic structure closes to the north-east at Esso Bass-2, but the sandfacies may climb section sufficiently to remove effective closure (See cross section). It is also possible that the Eocene and Oligocene sandstones coalesce to the northeast, toward the basin edge, reducing the chances of a stratigraphic trap at the top of Eocene.

Other pertinent facts:

1. With the exception of the Eocene, the formation tops in the well as predicted from the seismic data are essentially correct, indicating that there is likely little velocity variation laterally in this part of the basin.
2. The Eocene top being higher does not affect or reduce closure on this horizon. The error in prognosis is due to a "miss tie" of the seismic data between Esso Bass-1 and Esso Bass-2.
3. According to the seismic data the Eocene interval immediately below the unconformity in Esso Bass-1 is truncated so that the section seen in Esso Bass-2 is older than that in Esso Bass-1 and is probably Paleocene. Also, the two sections are distinctly different lithologically in that the section at Esso Bass-2 is made up largely of porous sandstone whereas that in Esso Bass-1 contains thick coal beds and much more shale and siltstone. This section in Esso Bass-2 lies directly on economic basement.
4. The volcanic interval (5511-5767) seen in Esso Bass-2 is petrologically unlike any extrusives seen in either Tasmania or Victoria. G. Everard, Tasmanian Mines Department petrologist reports that, it is "probably altered trachytic rock". This volcanic is considered to be economic basement.

The correlation of trachytes and syenites readily comes to mind and hence these volcanics are tentatively placed in the Lower Cretaceous, perhaps correlative with the Lower Cretaceous syenites

of Tasmania. It must however be born in mind that trachytes are often the result of a later phase of magmatic differentiation and are often closely associated with basalts, hence the trachyte of Esso Bass-2 may have more affinities with the widespread Jurassic dolerite of Tasmania.

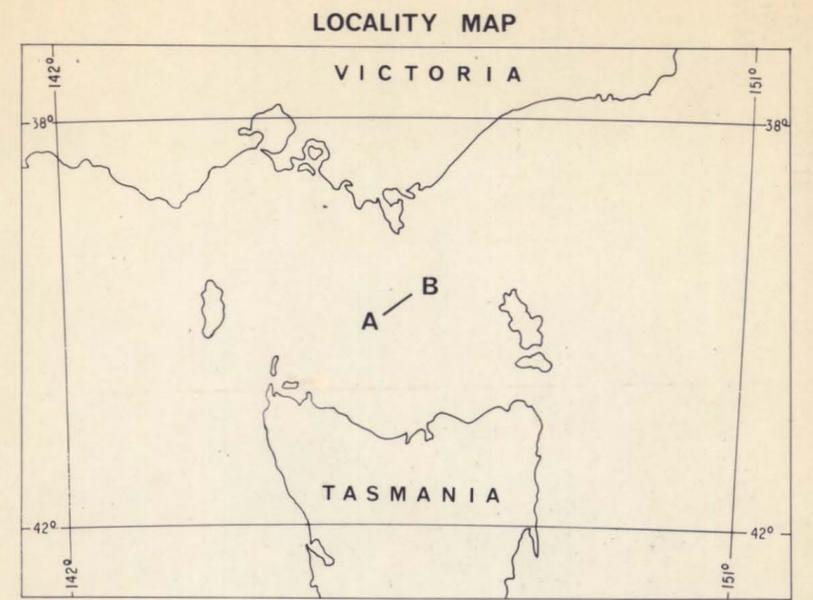
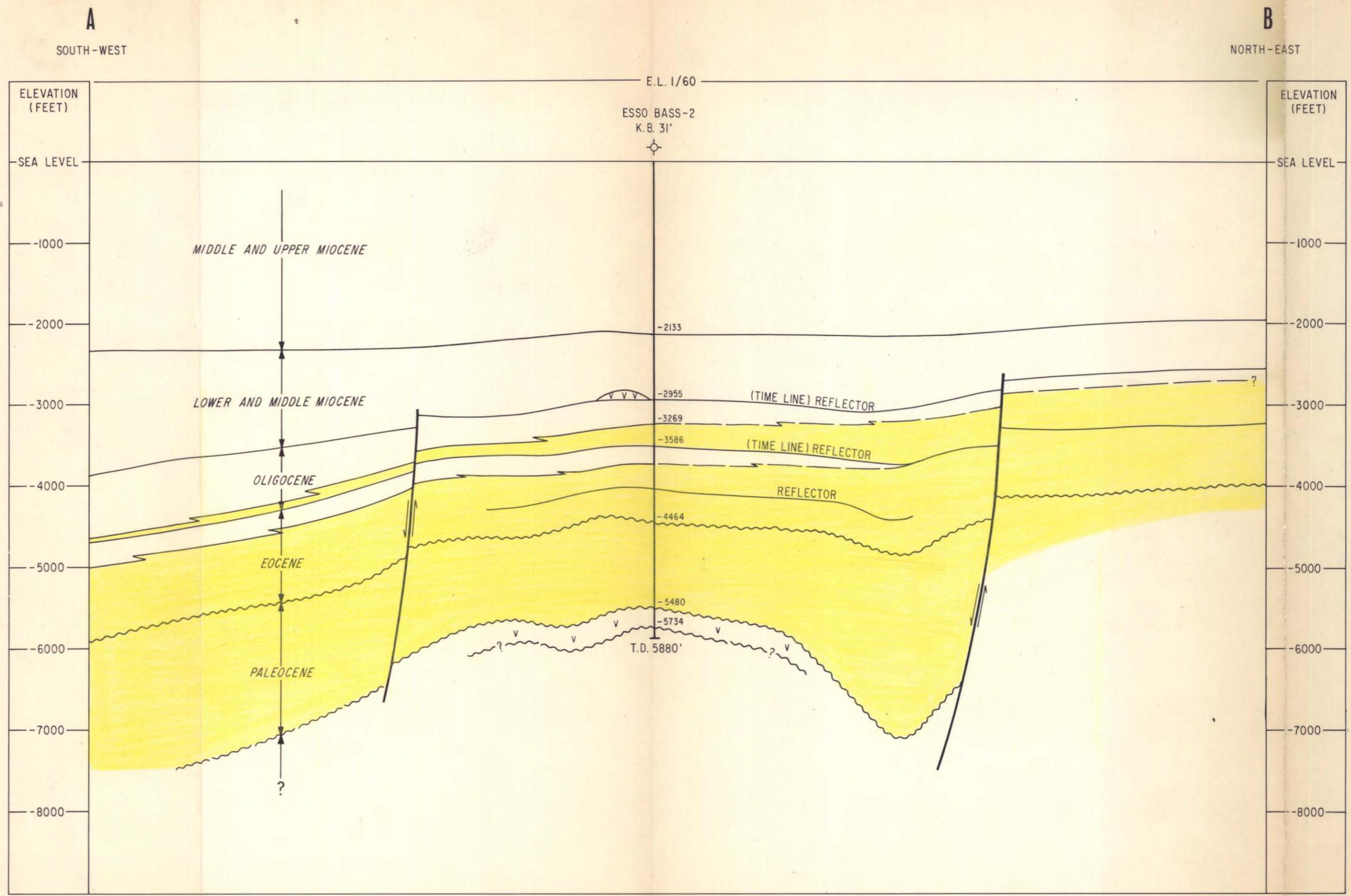
5. The low grade metamorphic rock in the interval (5767-5910) is of unknown age.

WHN:AB

By \_\_\_\_\_  
For J. D. Langston

Attachments:

Core Lab Grapholog & Coregraph.  
I.E.S. marked.



ESSO EXPLORATION AUSTRALIA INC. SYDNEY, NEW SOUTH WALES

**BASS BASIN AREA**  
 TASMANIA  
**GEOLOGICAL CROSS-SECTION A-B**  
**THROUGH ESSO BASS-2**  
**SHOWING**  
**EOCENE & OLIGOCENE SAND DEVELOPMENTS**

VERTICAL SCALE 1:12,000      DATUM: SEA LEVEL  
 HORIZONTAL SCALE 1:63,360  
 1 0 1 2  
 MILES  
 AUTHOR: W. H. NIXON      DRAFTED BY: A. F. STRAHAN



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