G E O L O G Y

Site Selection:

East Mereenie No 4 was selected as a crestal test on the East end of the Mereenie anticline. The well was site to intersect two porous and permeable sand horizons in the lower part of the Upper Pacoota within the oil column of the Mereenie Anticline. Previous geological and drilling information was combined to select a crestal site which at the top of the Pacoota formation, would be approximately 250 feet structurally higher than East Mereenie No 2.

In addition, the well was programmed as a deep test of the Cambrian section on the Anticline. This is the first well at Mereenie to be so programmed. Targets in the Cambrian were possible porous sand horizons in the Illara sandstone and the Basal Tempe formation. The well was expected to top the Proterozoic at approximately 8520 feet.

In effect, the well was to be a 9000 foot test of the Mereenie Anticline to initially evaluate the lower Upper Pacoota sands in the oil column and to test the previously untested Cambrian section on structure.

Formations Penetrated:

EAST MEREENIE NO 4 - FORMATION TOPS

Latitude : 24°01'57" South
Longitude : 131°37'48" East
G.L. +2,352' a.s.l.
K.B. +2,368' a.s.l.
All depths measured from K.B.
(Subsea depth +2,368')

STRATIGRAPHIC TABLE

Formation		Depth	Subsea	Thickness
Upper Mereenie	sandstone	Surface	+2352'	1520' +
Middle Mereenie	sandstone	1536'	+ 832'	113'
Lower Mereenie	sandstone	1649'	+ 719'	213'
Upper Strokes	shale	1862'	+ 506'	782'
Lower Strokes	shale	2644'	- 276'	247'
Upper Stairway	sandstone	2891'	- 523'	203'
Middle Stairway	sandstone	3094'	- 726'	318'
Lower Stairway	sandstone	3412'	-1044'	294'
Horn Valley	shale	3706'	-1338'	212'
Upper Pacoota	sandstone	3918'	-1550'	844'
Lower Pacoota	sandstone	4762'	-2394'	192'
Goyder	formation	4954'	-2586'	722'
Petermann	sandstone	5676'	-3308'	719'
Deception	member	6395'	-4027'	535'
Illara	sandstone	6930'	-4562'	656'
Tempe	formation	7586'	-5218'	794'
Bitter Springs	formation	8380'	-6012'	380'
Total Depth		8750'	-6382'	(penetrated)

Formation		Thickness
Mereenie	sandstone	1846' +
Stokes	shale	1029'
Stairway	sandstone	815'
Horn Valley	shale	212'
Pacoota	sandstone	1036'
Goyder	formation	722'
Cleland Eq.		2704'
Total Cambrian		3426'

DETAILED STRATIGRAPHY:

Surface - 1862' (Penetrated thickness 1846')
Mereenie Sandstone
Age: Palaeozoic (Silurian ?).

Surface - 1536' (Penetrated thickness 1520')
Upper Mereenie Sandstone
Description as for Mereenie No 1. Brown, minor white sandstone surface 0 1160'. White, clean, well sorted, sandstone, minor shale at base 1160' - 1536'.

1536' - 1649' (Thickness 113')
Middle Mereenie Sandstone. Description as for Mereenie No 1, scattered shale and siltstone in fine grained sandstone.

1649' - 1862' (Thickness 213')
Lower Mereenie sandstone. Description as for East Mereenie No 1, white, brown, fine grained sandstone 1649' - 1674'. Rust Brown, fine to medium grained sandstone 1674' - 1862'.

1862' - 2891' (Thickness 1029')
Stokes Shale
Age: Palaeozoic (Ordovician).

1862' - 2644' (Thickness 782')

Upper Stokes Shale Description as for Mereenie No 1.

2644' - 2891' (Thickness 247')
Lower Stokes Shale. Description as for Mereenie No 1.

2891' - 3706' (Thickness 815')
Stairway sandstone.
Age: Palaeozoic (Ordovician).

2891' - 3094' (Thickness 203')
Upper Stairway Sandstone. Description as for Mereenie No 1. Phosphate pellets through section, porosity developed in thin, clean sandstones.

3094' - 3412' (Thickness 318')
Middle Stairway Siltstone. Description as for Mereenie No 1. Phosphate material prevalent through section.

3412' - 3706' (Thickness 294')
Lower Stairway Sandstone. Description as for Mereenie No 1. Porosity associated with clean, well sorted sandstones 3512' - 3520' and below 3600'.

3706' - 3918' (Thickness 212')
Horn Valley Shale
Age: Palaeozoic (Ordovician)
Description as for Mereenie No 1.

3918' - 4954' (Thickness 1036')
Pacoota Sandstone
Age: Palaeozoic (Ordovician)

3918' - 4762' (Thickness 844')
Upper Pacoota Sandstone. Description as for East Mereenie No 1. Top gas sand in the Upper Pacoota at 3992' - major gas sand topped at 4195' - top

major glauxonite zone is at 4410'. The two target sandstone horizons in the lower part of the Upper Pacoota were intersected in the Oil Column (See Core Descriptions Appendix A (i)).

4762' - 4954' (Thickness 192')
Lower Pacoota Sandstone. Description as for East Mereenie No 1.

4954' - 5676' (Thickness 722')
Goyder Formation
Age: Palaeozoic (Cambrian)
Description as for East Mereenie No 1. In this well the units are less well defined. However, the Goyder formation is basically a sequence of interbedded dolomites (with minor Limestones), sandstone, shales and siltstones, in part gradational one to the other.

5676' - 8380' (Thickness 2704')
Cleland Equivalents.
Age: Palaeozoic (Cambrian)

5676' - 6395' (Thickness 719')
Petermann Sandstone.
Interbedded sandstone. Siltstone and Shale sequence. Sandstone is white, grey, minor brown, green, very fine to medium grained, well to medium sorted, siliceous, slightly calcareous. Much angillaceous material as inclusions and interbeds through sandstone. Sandstone is feldspathic grading to siltstone in part. Sandstone is feldspathic in part (pink brown inclusions) and plates of bronze mica are scattered through sandstone and shale. Whole section consists of very thinly bedded sandstone; siltstone, shale units with sandstone predominant.

6395' - 6930' (Thickness 535')
Deception Member:
Interbedded sandstone, siltstone and shale sequence. Sandstone is brown, minor white, very fine to medium grained, well to medium sorted, feldspathic and angillaceous inclusions. Siliceous, slightly calcareous. Shale is brown, green, micaceous, angillaceous, grading to siltstone in

part, unit is predominantly siltstone and shale with very thinly bedded sandstone.

6930' - 7586' (Thickness 656')

Illara sandstone:

Interbedded sandstone, siltstone and shale. Sandstone is brown, green, grey, very fine to medium grained, well to medium sorted with dense grains and angillaceous inclusions, feldspathic in part, siliceous. Siltstone and shale are gradational, red-brown, green siliceous, micaceous. Unit is interbedded sandstone, siltstone and shale with beds gradational one to the other. Note: much included material through sandstone and siltstone.

7586' - 8380' (Thickness 794')

Tempe Formation:

Interbedded sandstone, siltstone and shale in upper part. Sandstone is white, grey, brown, very fine to medium grained. Sandstone is white, grey, green, micaceous, angillaceous. Below 7940' unit consists of massive brown, siltstone grading to sandstone and shale in part. Brown siltstone is siliceous, micaceous, slightly dolomitic. Below 8110' unit consists of interbedded siltstone, shale and dolomite. Dolomite is black, white, dense, silty, microcrystalline and grades to limestone in part.

8380' - 8750' T D (Penetrated Thickness 380')

Bitter Springs Formation.

Age: Proterozoic.

interbedded grey dolomite and red brown siltstone. Dolomite is grey, brown, minor white, dense, silty, microcrystalline grade to limestone in part. Siltstone is red-brown, minor green, grey, dolomitic, slight vuggy porosity present in dolomite section.

Structure:

East Mereenie No 4 penetrated the top of the Pacoota at the subsea depth of - 1550 feet. This was 70 feet lower than programmed. The Mereenie sandstone and Stairway sandstone were slightly thicker than was

anticipated. The Cambrian section was essentially as predicted in the prognosis. See Figure Three (3) for comparisons of formation tops crestal wells on the Mereenie Anticline.

Note on Cambrian Lithology:

The Cambrian section at East Mereenie No 4 was disappointing. No significant shows of hydrocarbon were encountered and sand development was much poorer than expected. The basal Cambrian sand (present at East Johnny's Creek No 1) was absent from the section at this location. The Cambrian overlies the Proterozoic in this well with angular unconformity. The full section of Tempe formation (as compared with East Johnny's Creek No 1) is not present. The Petermann, Deception and Illara units are less well defined that they are at East Johnny's Creek No 1 and are probably better referred to as Cleland Equivalents. See Sample Descriptions for details of Cambrian section.

Porosity and Permeability of Sediments Penetrated:

Visual examination of cuttings showed some porosity to be present in the Mereenie sandstone particularly in the lower Mereenie Aquifer. Porosity was noted in clean sands in both the Upper and Lower Stairway Sandstone. Porosity determined from visual observations is noted in the sample descriptions. Core samples from the sand horizons in the Pacoota sandstone are described in Appendix A (i); Appendix A (ii) and (iii) show the results of test carried out by Core Laboratories and the BMR respectively on these sands. Very little porosity was observed in the Cambrian section in this well. There is some vuggy porosity developed in Bitter Springs dolomite. See the Composite Log (Figure 5) for details of water and gas flows associated with porosity.

Detailed analysis of the sandstone horizons within the oil column shows a slight decrease in porosity and permeability in these sands as compared with East Mereenie No 2.