

WELL COMPLETION REPORT

EAST MEREENIE NO. 8

Oilmin N.L.,
27 - 35 Turbot Street,
BRISBANE, QLD. 4000

February, 1983

NORTHERN TERRITORY
GEOLOGICAL SURVEY

PR82/m

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EAST MEREENIE #8 SEPTEMBER 4 1982	20-23
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1. SUMMARY

1. SUMMARY:

East Mereenie No. 8 is the fourth well of a 20 well appraisal programme to delineate and develop the Mereenie Oilfield. It was drilled to test the western extent of the "new" oil accumulation discovered in the P1 unit in East Mereenie No. 6. The well is located 1.25 miles northwest of East Mereenie No. 6, and intersected the target horizon (the P1 unit) approximately 200 feet updip.

The well was spudded on the 26th June, 1982 at 1800 hours, using the OIME SL750 Mereenie Rig No. 1, and reached a total depth of 4942 feet in the Pacoota Sandstone (P2 unit) on the 11th August, 1982 at 0445 hours.

The well was drilled with gas and gas/mist to 4295 feet where, as a result of a gas flow of 7.29 Mmcf/d from the Lower Stairway Sandstone, a water based mud system was used to kill the well. Drilling continued with this mud system to 4659 feet, 95 feet into the top of the P1 unit.

Drill stem test Nos. 1 and 2 and Core No. 1 were run in this 95 foot interval. Drill stem test No. 1 showed the interval tested was poorly permeable however drill stem test No. 2 over the interval 4630 - 4659 feet flowed gas (390 mcf/d) and oil (540 BOPD) to surface.

After the 8-5/8" casing was run to 4591 feet the mud was changed to an oil based system. Drill stem test No. 3B retested the same zone as drill stem test No. 2 to evaluate whether the water based mud and or casing operations had caused any formation damage. The resulting flows of 548 BOPD and 402 mcf/d gas confirmed that no damage had occurred.

The oil from drill stem tests 2 and 3B were similar in colour and density to that obtained from East Mereenie No. 6.

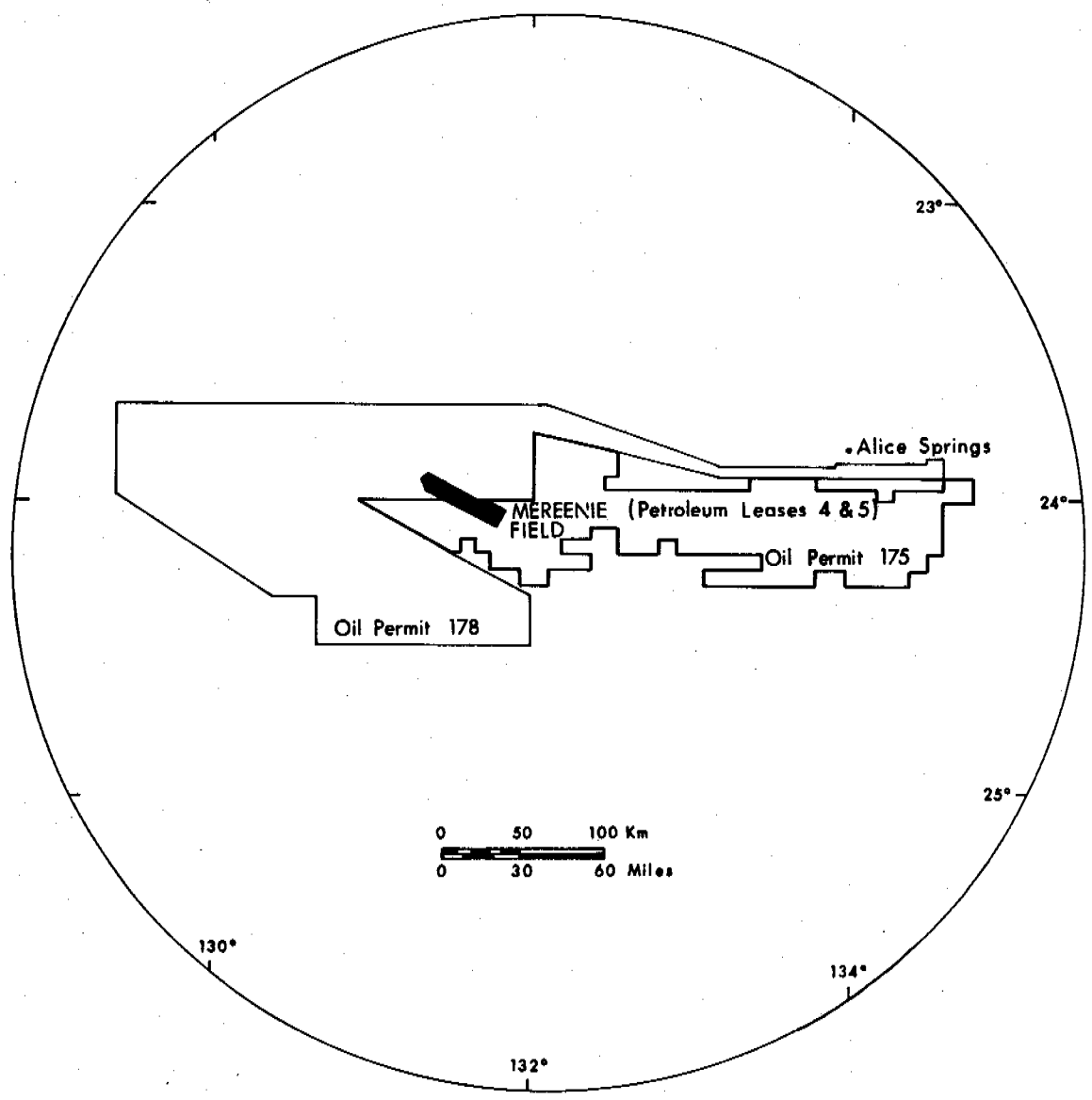
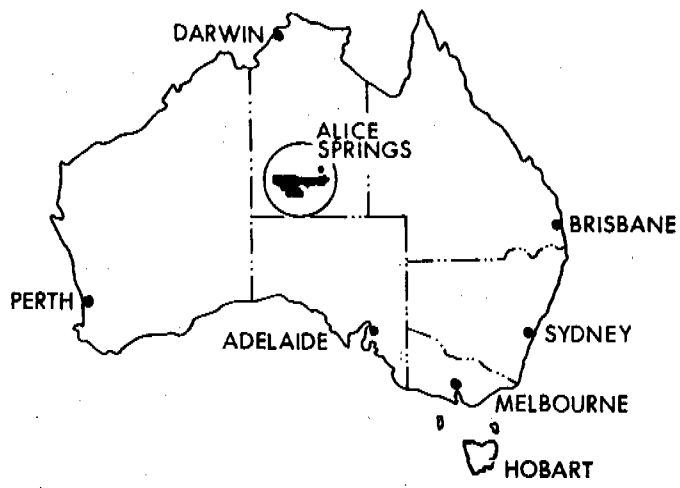
The well was then drilled ahead to a total depth of 4942 feet, in the P2 unit without any permeable reservoirs being penetrated.

A total of six drill stem tests were run and four cores cut to test the Pacoota Sandstone P1 unit.

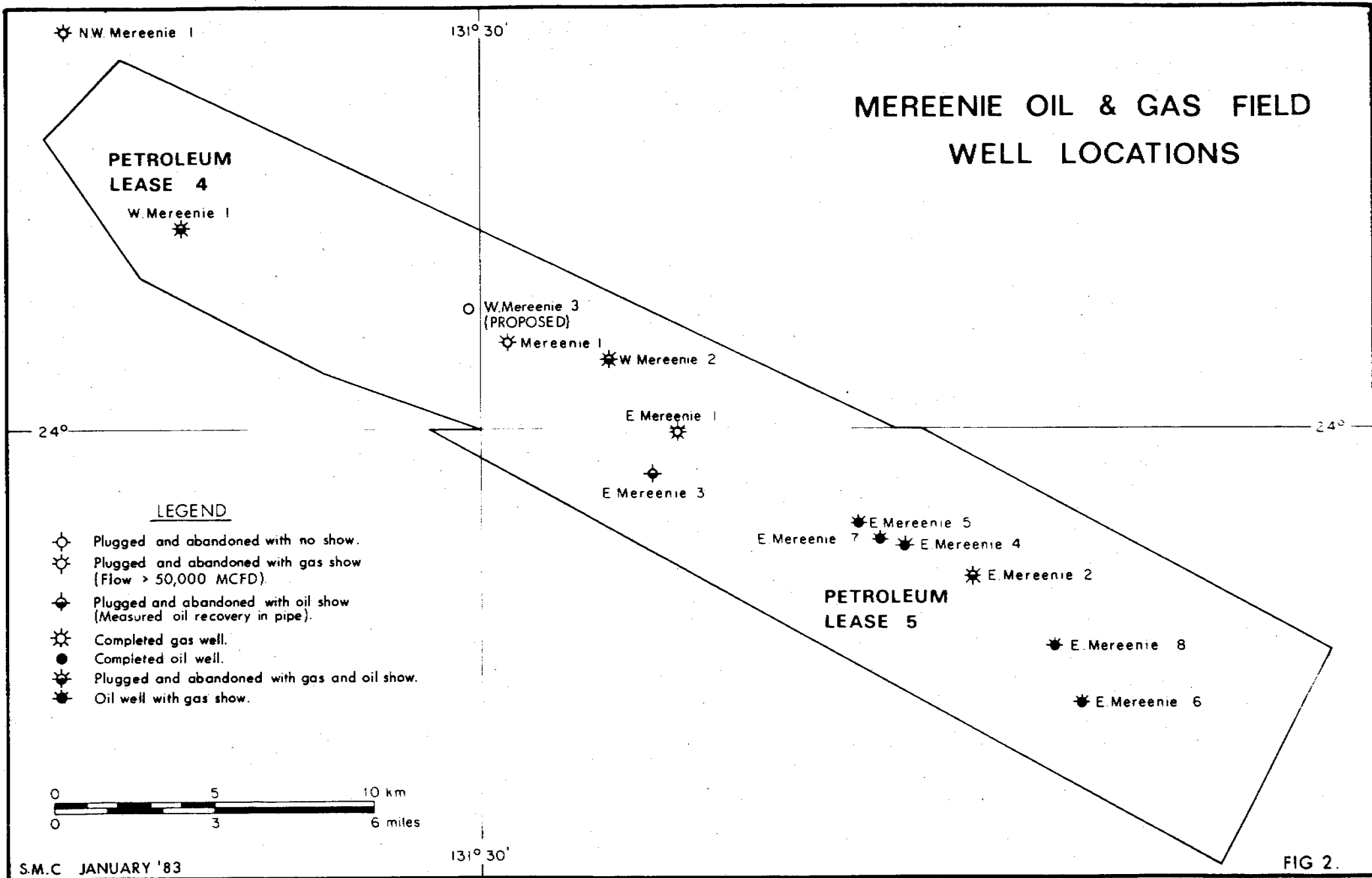
Neither the gas/oil nor oil/water contact was detected.

Production tubing (2-3/8") was landed at 4893 feet and the well completed (barefoot) as an oil producer.

The rig was released at 0330 hours on the 14th August, 1982.



LOCATION MAP



0385

FIG 2.

2. WELL HISTORY

2. WELL HISTORY

The daily progress and main operations are shown on the time/depth graph (Figure 3).

2.1 General Data

Well name and number: East Mereenie No. 8.

Operator: Oilmin N.L.

Beneficial interest holders: Magellan Petroleum Australia Ltd.
Canso Resources Limited
Oilmin N.L.
Transoil N.L.
Petromin N.L.
Flinders Petroleum N.L.
Moonie Oil Proprietary Ltd.

Petroleum title: Petroleum Lease No. 5.

District: Alice Springs, Northern Territory.

Location: Latitude: 24° 03' 40"
Longitude: 131° 40' 03"

Elevation: Ground level: +2342 feet MSL.
Kelly bushing: +2362 feet MSL.

Total depth: 4942 feet (driller)
4939 feet (logger)

Spudded: 26th June, 1982 at 1800 hours.

Released: 14th August, 1982 at 0330 hours.

Well status: Barefoot completion for oil production from the Pacoota Sandstone (P1 unit).

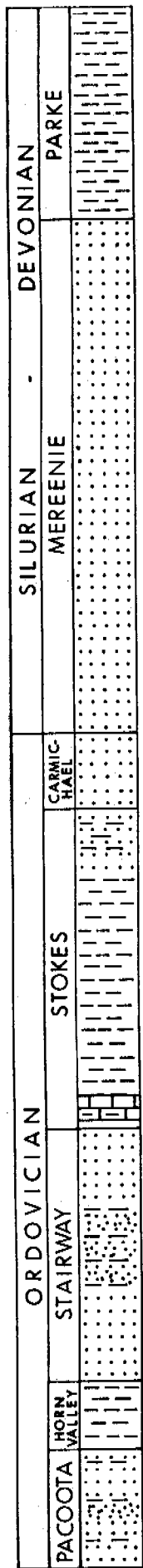
Geological formation tops:

Parke Siltstone	Surface
Mereenie Sandstone	665'
Carmichael Sandstone	2303'
Stokes Siltstone	2535'
Stairway Sandstone	3562'
Horn Valley Siltstone	4353'
Pacoota Sandstone	4564'
Total depth	4942'

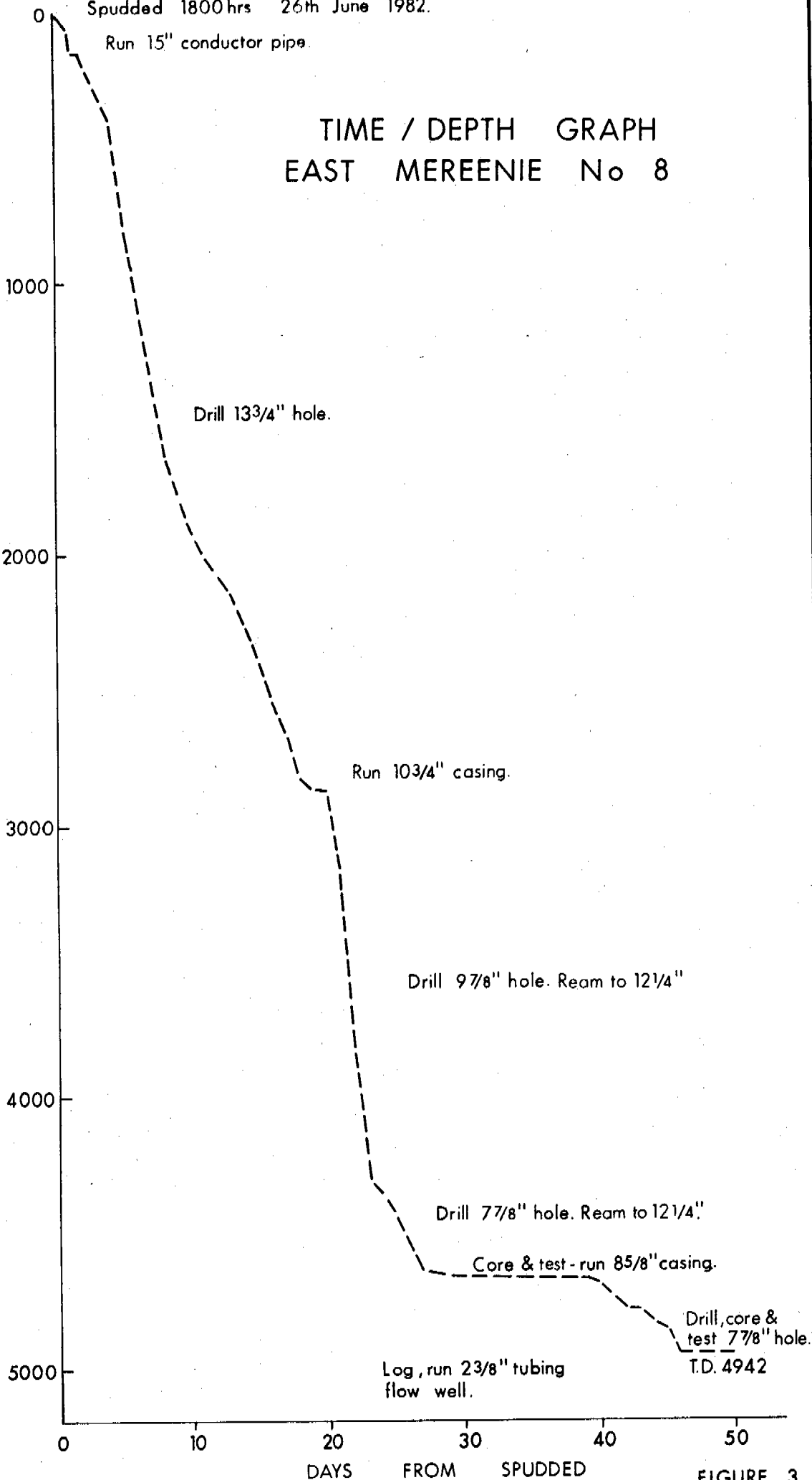
Spudded 1800 hrs 26th June 1982.

Run 15" conductor pipe.

TIME / DEPTH GRAPH EAST MEREENIE No 8



K. B.
BELOW
FEET



2.2 Rig Data

Drilling contractor: Mereenie Joint Venture Partners.

Drilling plant: Make: O.I.M.E.
Type: Model SL-5 (SL-750).
Rated Capacity: 12,500 ft. with 4-1/2" O.D. drill pipe.
Motors: 3 - Caterpillar D-3408 (compounded) 385 B.H.P. each.

Mast: Make: Parco Model P-131.
Type: Cantilever
Rated Capacity: 550,000 lbs (10 lines).

Pumps: Make: 2 - Continental Emsco Triplex.
Type: F-800 - V-belt driven from compound.
Size: 6-3/4" x 9".

Rotary table: Make: IDECO LR-275 (27-1/2").
Capacity: 570 tons dead load.

Blowout preventors: Make: Cameron Cameron
Model: "U" Double Gate "D" Annular
Size: 13-5/8" 13-5/8"
Rating (PSI): 5000 5000

Choke manifold: Make: McEvoy.
Size & Type: 3" - 5000 PSI W.P. choke and kill with one positive and one adjustable choke and Cameron 3" - 5000 H.C.R. flanged valve.

Mud tanks: Size & Capacity: 3 tank system - returns, settling and suction. Total capacity: 777 barrels.

Shale shaker: Make: Brandt.
Type: Single dual screen.

2.2 Rig Data (Contd.)

Mud mixers: Make: 4-Brandt heavy duty.
 Type: 32" blade - electrically driven.

Desander: Make: DEMCO.
 Model: 84, comprising 4 x 8" cones.
 Capacity: 540 to 700 GPM electrically driven.

Desilter: Make: DEMCO.
 Model: 412-H, comprising 12 x 4" cones.
 Capacity: 960 to 1080 GPM electrically driven.

Drill pipe: 4-1/2" O.D. 16.6 lbs/ft. API Grade "E" - EUE. Seamless range 2 - 18° taper, internally coated with 6-1/4" O.D. by 3-1/2" tool joints, hardbanded, 4-1/2" x H connections.

Drill collars: 6 x 8" O.D. 2-13/16" I.D. x 31 ft. 6-5/8" reg. connections.
 12 x 7" O.D. 2-13/16" I.D. x 31 ft. 4" I.F. connections.
 27 x 6-1/2" O.D. 2-1/4" I.D. x 31 ft. 4" I.F. connections.
 3 x 4-1/8" O.D. 2" I.D. x 31 ft. 3-1/2" reg. connections.

Air drilling equipment:

 Air compressors: Make: 3 only Sullair units.
 Model: 900/250 D.U.
 Capacity: 900 CFM at 250 PSI each.

 Air compressor booster: Make: Knight Industries.
 Model: K.O.A. Model 2.
 Capacity: 245 PSI inlet and 1400 PSI discharge at 1500 CFM.

2.3 Drilling Data

2.3.1 Drilling Record

WELL: East Mereenie No.: 8

FIELD: Mereenie

Date	E.T.D. (ft)	Details of Operations, Descriptions and Results
1982		
June 26	54	Complete rig-up. Drilled rat hole. Spud 1800 hrs. Drilled 17-1/2" hole to 54 ft.
June 27	191	Drilled 17-1/2" hole to 191 ft. Ran 15" conductor pipe to 153 ft. Hit bridge. Unable to work through. Cemented with 230 sacks construction cement.
June 28	206	Installed rotating B.O.P. Tied into blooey line. Drilled mousehole. Gas drilled 13-3/4" hole to 206 ft.
June 29	402	Mist drilled 13-3/4" hole to 402 ft.
June 30	771	Mist drilled 13-3/4" hole to 771 ft. Hole making estimated 100 bbls water per hr.
July 1	1055	Mist drilled 13-3/4" hole to 1055 ft.
July 2	1322	Mist drilled 13-3/4" hole to 1322 ft. Hole making estimated 200 bbls water per hr.
July 3	1620	Mist drilled 13-3/4" hole to 1620 ft. Hole making estimated 350 bbls water per hr.
July 4	1772	Mist drilled 13-3/4" hole to 1722 ft.
July 5	1900	Mist drilled 13-3/4" hole to 1900 ft. Hole making estimated 500 bbls water per hr.
July 6	1998	Mist drilled 13-3/4" hole to 1998 ft.
July 7	2066	Mist drilled 13-3/4" hole to 2066 ft.
July 8	2158	Mist drilled 13-3/4" hole to 2158 ft.

WELL: East Mereenie No. 8

FIELD: Mereenie

Date	E.T.D. (ft.)	Details of Operations, Descriptions and Results.																						
July 9	2263	Mist drilled 13-3/4" hole to 2263 ft.																						
July 10	2402	Mist drilled 13-3/4" hole to 2402 ft.																						
July 11	2557	Mist drilled 13-3/4" hole to 2557 ft.																						
July 12	2658	Renewed Kelly Hose. Mist drilled 13-3/4" hole to 2658 ft.																						
July 13	2834	Mist drilled 13-3/4" hole to 2834 ft.																						
July 14	2872	<p>Mist drilled 13-3/4" hole to 2872 ft. Ran 73 joints of 10-3/4", 40.5 lbs/ft H40 ST & C casing to 2867 ft. Cemented with 520 sacks of construction cement in a 15.0 - 15.5 lbs/gal slurry. Displaced with 277 bbls water and bumped plug with 800 psi.</p> <p style="text-align: center;"><u>10-3/4" CASING DETAILS</u></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 150px;">2872.00'</td> <td>T.D. of 13-3/4" hole.</td> </tr> <tr> <td>7.00'</td> <td>Off bottom.</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>2867.00'</td> <td>Hanging depth.</td> </tr> <tr> <td>3.20'</td> <td>Guide shoe and float collar.</td> </tr> <tr> <td>2846.20'</td> <td>73 joints 10-3/4" casing.</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>17.60'</td> <td></td> </tr> <tr> <td>17.60'</td> <td>Landing Joint</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>0.00'</td> <td>K.B.</td> </tr> </table>	2872.00'	T.D. of 13-3/4" hole.	7.00'	Off bottom.	<hr/>		2867.00'	Hanging depth.	3.20'	Guide shoe and float collar.	2846.20'	73 joints 10-3/4" casing.	<hr/>		17.60'		17.60'	Landing Joint	<hr/>		0.00'	K.B.
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0.00'	K.B.																							
July 15	2872	W.O.C. Install B.O.Ps. Pressure tested B.O.Ps, casing and choke manifold to 1000 psi. Tests OK. Clean out cement.																						
July 16	3157	Clean out cement to shoe. Pressure test casing and Hydril to 1000 psi. Test OK. Drilled out shoe. Gas drilled 9-7/8" hole to 3157 ft.																						
July 17	3796	Gas drilled 9-7/8" hole to 3796 ft.																						
July 18	4298	Gas drilled 9-7/8" hole to 4295 ft. Gas flow 7.29 MMCFD from Lower Stairway Sandstone. Killed well. Mud drilled 9-7/8" hole to 4298 ft.																						
July 19	4341	Drilled 9-7/8" hole to 4341 ft. Reduced bit size from 9-7/8" to 7-7/8".																						
July 20	4426	Drilled 7-7/8" hole to 4426 ft.																						

WELL: East Mereenie No. 8.

FIELD: Mereenie.....

Date	E.T.D. (ft.)	Details of Operations, Descriptions and Results.														
July 21	4524	Drilled 7-7/8" hole to 4524 ft.														
July 22	4635	Drilled 7-7/8" hole to 4635 ft. Run in hole for D.S.T. No. 1.														
July 23	4646	<p>Ran D.S.T. No. 1 over interval 4575 - 4635 ft. Very weak blow declining to zero. Recovered 30 ft. very slightly oil cut mud.</p> <p><u>FIELD CHART READINGS D.S.T. NO. 1</u></p> <table border="1"> <thead> <tr> <th><u>IHP</u></th> <th><u>IFP</u></th> <th><u>ISIP</u></th> <th><u>FFP</u></th> <th><u>FSIP</u></th> <th><u>FHP</u></th> <th><u>BHT</u></th> </tr> </thead> <tbody> <tr> <td>2616</td> <td>53</td> <td>140</td> <td>105</td> <td>140</td> <td>2616</td> <td>130°F</td> </tr> </tbody> </table> <p>Drilled 7-7/8" hole to 4646 ft.</p>	<u>IHP</u>	<u>IFP</u>	<u>ISIP</u>	<u>FFP</u>	<u>FSIP</u>	<u>FHP</u>	<u>BHT</u>	2616	53	140	105	140	2616	130°F
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2616	53	140	105	140	2616	130°F										
July 24	4659	<p>Drilled 7-7/8" hole to 4659 ft. Ran D.S.T. No. 2 over interval 4630 - 4659 ft. Immediate strong blow. Gas to surface after 4 minutes. Closed in after 10 mins IFP for 60 minutes. Opened up strong blow. Oil to surface 5 mins after reopened tools. Flowed through separator for 90 minutes of the 130 mins FF. Gas at 390 MCFD. Oil rate 540 bbls per day. Shut in for 180 mins FSI. Oil was 47° API at 57°F. Gas oil ratio 722 cu. ft./bbl.</p> <p><u>FIELD CHART READINGS D.S.T. NO. 2</u></p> <table border="1"> <thead> <tr> <th><u>IHP</u></th> <th><u>IFP</u></th> <th><u>ISIP</u></th> <th><u>FFP</u></th> <th><u>FSIP</u></th> <th><u>FHP</u></th> <th><u>BHT</u></th> </tr> </thead> <tbody> <tr> <td>2633</td> <td>332</td> <td>1785</td> <td>679</td> <td>1785</td> <td>2633</td> <td>N.R.</td> </tr> </tbody> </table>	<u>IHP</u>	<u>IFP</u>	<u>ISIP</u>	<u>FFP</u>	<u>FSIP</u>	<u>FHP</u>	<u>BHT</u>	2633	332	1785	679	1785	2633	N.R.
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2633	332	1785	679	1785	2633	N.R.										
July 25	4659	Opened up 7-7/8" hole to 9-7/8" from 4341 ft. to 4428 ft.														
July 26	4659	Opened up hole to 4622 ft.														
July 27	4659	Opened up hole to 4659 ft. Ran Gearhart Sonic Gamma Ray Caliper, Neutron Density and Dual Induction logs. Ran in with drill pipe.														
July 28	4659	Ran cement plug above production sand. Opened up 9-7/8" hole to 12-1/4" hole from 2861 ft. to 4017 ft.														

Date	E.T.D. (ft.)	Details of Operations, Descriptions and Results.
July 29	4659	Opened up hole to 4600 ft. Ran Gearhart X-Y caliper log. Ran four joints 8-5/8" casing on drill pipe to check hole.
July 30	4659	<p>Checked hole with 8-5/8" casing. Ran 134 joints 8-5/8" 32 lbs/ft. J55 ST & C casing to 4591 ft. Cemented with 688 sacks construction cement treated with .02% HR4 retarder in a 15.4 ppg slurry. Displaced with 10 bbls water and 266 bbls mud. Bumped plug with 2000 psi.</p> <p style="text-align: center;"><u>8-5/8" CASING DETAILS</u></p> <p>4600.00' Top of cement plug. 9.00' Off bottom.</p> <hr/> <p>4591.00' Hanging depth. 1.70' Float shoe. 4589.30' 134 joints of 8-5/8" casing</p> <hr/> <p>0.00' K.B.</p>
July 31	4659	W.O.C. Remove B.O.Ps., land casing. Reinstall B.O.Ps. Pressure test B.O.Ps, casing and choke manifold to 1500 psi for 15 mins. Tests OK.
August 1	4659	Clean out cement. Run in to 4659 ft. Circulated and conditioned hole. Trip for D.S.T. No. 3.
August 2	4659	Packer seat failed on test. Back circulated and conditioned hole. Tripped to test.
August 3	4659	Ran D.S.T. No. 3B over interval 4586 to 4659 ft. Gas to surface after 9 minutes. Closed in for ISIP after 10 minutes. Opened tools after 63 minutes shut in. Oil to surface 31 minutes after reopening. Flowed through separator for 90 minutes. Flow rate 548 bbls oil per day. Gas at 402 MCFD. Gas oil ratio 733 cu. ft./bbl. Closed in for FSI after 130 mins flow. FSI 488 minutes.

Well: East Mereenie No. 8... Field: Mereenie.....

Date	E.T.D. (ft.)	Details of Operations, Descriptions and Results.														
<u>FIELD CHART READINGS D.S.T. NO. 3B</u>																
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><u>IHP</u></td> <td style="text-align: center;"><u>IFP</u></td> <td style="text-align: center;"><u>ISIP</u></td> <td style="text-align: center;"><u>FFP</u></td> <td style="text-align: center;"><u>FSIP</u></td> <td style="text-align: center;"><u>FHP</u></td> <td style="text-align: center;"><u>BHT</u></td> </tr> <tr> <td style="text-align: center;">2097</td> <td style="text-align: center;">350</td> <td style="text-align: center;">1786</td> <td style="text-align: center;">610</td> <td style="text-align: center;">1786</td> <td style="text-align: center;">2097</td> <td style="text-align: center;">130°F</td> </tr> </table>			<u>IHP</u>	<u>IFP</u>	<u>ISIP</u>	<u>FFP</u>	<u>FSIP</u>	<u>FHP</u>	<u>BHT</u>	2097	350	1786	610	1786	2097	130°F
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2097	350	1786	610	1786	2097	130°F										
August 4	4689	Cored and drilled to 4689 ft.														
August 5	4731	Ran D.S.T. No. 4 over interval 4655 to 4691 ft. Recovered 1 bbl oil cut mud on back circulation. Interval tight. Drilled to 4731 ft.														
<u>FIELD CHART READINGS D.S.T. NO. 4</u>																
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><u>IHP</u></td> <td style="text-align: center;"><u>IFP</u></td> <td style="text-align: center;"><u>ISIP</u></td> <td style="text-align: center;"><u>FFP</u></td> <td style="text-align: center;"><u>FSIP</u></td> <td style="text-align: center;"><u>FHP</u></td> <td style="text-align: center;"><u>BHT</u></td> </tr> <tr> <td style="text-align: center;">2149</td> <td style="text-align: center;">70</td> <td style="text-align: center;">1820</td> <td style="text-align: center;">122</td> <td style="text-align: center;">1785</td> <td style="text-align: center;">2149</td> <td style="text-align: center;">135°F</td> </tr> </table>			<u>IHP</u>	<u>IFP</u>	<u>ISIP</u>	<u>FFP</u>	<u>FSIP</u>	<u>FHP</u>	<u>BHT</u>	2149	70	1820	122	1785	2149	135°F
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2149	70	1820	122	1785	2149	135°F										
August 6	4783	Drilled to 4783 ft. Ran D.S.T. No. 5 over interval 4690 - 4783 ft. Recovered 1 bbl gas cut mud on back circulation. Interval tight.														
<u>FIELD CHART READINGS D.S.T. NO. 5</u>																
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><u>IHP</u></td> <td style="text-align: center;"><u>IFP</u></td> <td style="text-align: center;"><u>ISIP</u></td> <td style="text-align: center;"><u>FFP</u></td> <td style="text-align: center;"><u>FSIP</u></td> <td style="text-align: center;"><u>FHP</u></td> <td style="text-align: center;"><u>BHT</u></td> </tr> <tr> <td style="text-align: center;">2183</td> <td style="text-align: center;">175</td> <td style="text-align: center;">1595</td> <td style="text-align: center;">122</td> <td style="text-align: center;">1907</td> <td style="text-align: center;">2183</td> <td style="text-align: center;">135°F</td> </tr> </table>			<u>IHP</u>	<u>IFP</u>	<u>ISIP</u>	<u>FFP</u>	<u>FSIP</u>	<u>FHP</u>	<u>BHT</u>	2183	175	1595	122	1907	2183	135°F
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2183	175	1595	122	1907	2183	135°F										
August 7	4790	Drilled and cored to 4790 ft.														
August 8	4821	Cored to 4817 ft. Drilled to 4821 ft.														
August 9	4854	Drilled to 4842 ft. Cored to 4854 ft.														
August 10	4933	Drilled to 4933 ft.														
August 11	4942	Drilled to 4942 ft. Ran D.S.T. No. 6 over interval 4855 - 4942 ft. No blow. No recovery. Interval tight. Ran electric logs.														
<u>FIELD CHART READINGS D.S.T. NO. 6</u>																
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><u>IHP</u></td> <td style="text-align: center;"><u>IFP</u></td> <td style="text-align: center;"><u>ISIP</u></td> <td style="text-align: center;"><u>FFP</u></td> <td style="text-align: center;"><u>FSIP</u></td> <td style="text-align: center;"><u>FHP</u></td> <td style="text-align: center;"><u>BHT</u></td> </tr> <tr> <td style="text-align: center;">2356</td> <td style="text-align: center;">105</td> <td style="text-align: center;">490</td> <td style="text-align: center;">157</td> <td style="text-align: center;">1318</td> <td style="text-align: center;">2356</td> <td style="text-align: center;">135°F</td> </tr> </table>			<u>IHP</u>	<u>IFP</u>	<u>ISIP</u>	<u>FFP</u>	<u>FSIP</u>	<u>FHP</u>	<u>BHT</u>	2356	105	490	157	1318	2356	135°F
<u>IHP</u>	<u>IFP</u>	<u>ISIP</u>	<u>FFP</u>	<u>FSIP</u>	<u>FHP</u>	<u>BHT</u>										
2356	105	490	157	1318	2356	135°F										

Well: . East Mereenie No. 8.. Field: Mereenie

Date	E.T.D. (ft.)	Details of Operations, Descriptions and Results.
August 12	4942	Ran Gearhart logs. R.I.H. Circulated and conditioned mud. Pulled out laying down pipe. Picked up B.O.Ps. Installed tubing landing head. Reinstalled B.O.Ps.
August 13	4942	Installed 2-3/8" rams. Ran tubing. Landed in tubing head. Removed B.O.Ps. Installed Christmas Tree. Displaced mud with crude oil. Flowed well from open hole interval 4591 to 4942 ft.
August 14	4942	Flowed well to clean. Released rig at 1530 hrs.

2.3.2 Hole Sizes and Depth

17-1/2" to 191 feet.

13-3/4" to 2,872 feet.

9-7/8" to 4,341 feet (reamed to 12-1/4").

7-7/8" to 4,659 feet (reamed to 12-1/4").

7-7/8" to 4,942 feet (total depth).

2.3.3 Casing and Cementing Details

15" casing: Weight: not specified

Grade: welded

Shoe depth: 153 feet

Cement used: 230 sacks

10-3/4" casing: Weight: 40.5 lbs/ft.

Grade: H40

Shoe depth: 2,867 feet

Cement used: 520 sacks

8-5/8" casing: Weight: 32 lbs/ft.

Grade: J55

Shoe depth: 4,591 feet

Cement used: 688 sacks

2.3.5 Drilling Fluid

The 17-1/2" hole was air drilled to 191 feet, at which depth 15" casing was run to 153 feet.

The 13-3/4" hole was gas drilled from the 15" casing shoe to 206 feet, and gas mist drilled to 2872 feet. 10-3/4" casing was set at 2867 feet and the hole size reduced to 9-7/8". Gas drilling continued down to 4295 feet where Lower Stairway Formation gas was intersected. The well was killed with a 10.4 ppg freshwater gel mud, and drilling continued to 4341 feet.

From 4341 feet a 7-7/8" hole was drilled to 4659 feet. After running D.S.T. No. 2, the hole was reamed out to 12-1/4" from the 10-3/4" casing shoe depth at 2867 feet. 8-5/8" casing was run and set at 4591 feet. The freshwater gel mud was then replaced by an oil emulsion mud, and a 7-7/8" hole was drilled to T.D. at 4942 feet.

Water was brought by road from the waterwell four miles northwest and supplemented by recirculation of formation water during the gas mist drilling phase. Gas was tapped from East Mereenie No. 2 well, three miles northwest through a 2" line, controlled by a 3/4" choke at the rig to maintain the required circulating pressure.

The daily mud properties are as follows :-

2.3.6 Formation Sampling

(i) Ditch cuttings -

Samples were taken at intervals of 30 ft. from 190 ft. to 4290 ft. Below this depth samples were taken at intervals of 10 ft. to 4940 ft. When drilling with mud two splits of sample were bagged untreated and three splits then made of the washed and dried samples. Where air/gas or mist drilling provided only cuttings powder this was split five ways. The samples were distributed as follows -

Oilmin:	1 set washed and dried)	} mud drilling
	1 set untreated	
	2 sets powder - air/gas/mist drilling	
Magellan:	1 set washed and dried - mud drilling	
	1 set powder - air/gas/mist drilling	
N.T. Mines		
Dept.:	1 set washed and dried)	} mud drilling
	1 set untreated	
	2 sets powder - air/gas/mist drilling	

Samples descriptions are given in Appendix 1.

(ii) Coring -

A total of 82.4 ft. of core was cut in four coring runs averaging 95% recovery.

<u>Core No.</u>	<u>Interval (driller)</u> (ft)	<u>Interval (corrected)</u> (ft)	<u>Rec</u>	<u>Rec</u> (ft)(%)	<u>Bit Type</u>
1	4635.8-4645.5	same	7.8	80	C20 (7-27/32)
2	4660 -4689.7	same	29.7	100	C20 (7-27/32)
3	4785.7-4817	same	29.3	96	C20 (7-27/32)
4	4842.5-4854.2	same	10.7	90	C20 (7-27/32)

Full descriptions of the cores are included in Appendix 2.

(iii) Sidewall sampling -

No sidewall samples were taken.

2.3.7 Logging and Surveys

(i) Electric Logging -

The following logs were run using a Gearhart DDL logging unit :-

<u>Log</u>	<u>Run</u>	<u>Interval (ft)</u>	<u>Date</u>
BCS-GR-CAL	1	2866 - 4625	27/7/82
		(GR Surface - 4625)	27/7/82
DIL-GR-CAL	1	2866 - 4657	27/7/82
CDL-CNS-GR	1	3625 - 4658	27/7/82
CAL-GR	1	2866 - 4597	29/7/82
DIL-GR-CAL	2	4591 - 4932	11/8/82
BCS-GR-CAL	2	4591 - 4906	11/8/82
CDL-CNS-GR	2	4591 - 4938	12/8/82

Prints of all wireline logs are included as Enclosure 3.

(ii) Penetration rate and gas logs -

The penetration rate was recorded continuously from spud to total depth. The mud gas was monitored continuously on a conventional hotwire detector during the mud drilling phase.

A mud log showing penetration rate, gas, lithological and other pertinent details was prepared at the wellsite on a daily basis and is included as Enclosure 2.

(iii) Deviation surveys -

Deviation surveys are shown in 2.3.4 (Bit and deviation records).

(iv) Temperature surveys -

Temperature surveys were not carried out, however, the following temperatures were recorded :-

- 132° F at 4932 feet (Gearhart)
- 130°F at 4635 feet (Halliburton)
- 130°F at 4659 feet (Halliburton)
- 135°F at 4691 feet (Halliburton)
- 135°F at 4783 feet (Halliburton)
- 135°F at 4942 feet (Halliburton)

2.3.8 Formation Testing

Drill stem testing -

- D.S.T. 1 Interval: 4575 to 4635 feet.
Method: Conventional dual bottom hole.
Tester: Halliburton.
Results: Recovered 30 feet of very slightly oil cut mud.
- D.S.T. 2 Interval: 4630 to 4659 feet.
Method: Conventional dual bottom hole.
Tester: Halliburton.
Results: Gas measured at 390 MCFD. Recovered in the stock tank 34 bbls of 47° API oil. 540 BOPD.
- D.S.T. 3 Interval: 4590 to 4659 feet.
Method: Conventional dual bottom hole.
Tester: Halliburton.
Results: Packer failed. Test re-run as D.S.T. 3B.
- D.S.T. 3B Interval: 4586 to 4659 feet.
Method: Conventional dual bottom hole.
Tester: Halliburton.
Results: Gas measured at 402 MCFD. Recovered in the stock tank 34.28 bbls of 47° API oil. 548 BOPD.

2.3.8 Formation Testing (Contd.)

D.S.T. 4 Interval: 4655 to 4690.7 feet.
Method: Conventional dual bottom hole.
Tester: Halliburton
Results: Gas TSTM. No fluids to surface. Recovered 1 bbl of oil cut mud on reverse circulation and 30 feet of oil cut mud from the test tool.

D.S.T. 5 Interval: 4689.5 to 4783 feet.
Method: Conventional dual bottom hole.
Tester: Halliburton.
Results: Gas TSTM. No fluids to surface. Recovered 1 bbl of gas cut mud on reverse circulation.

D.S.T. 6 Interval: 4854.5 to 4942 feet.
Method: Conventional dual bottom hole.
Tester: Halliburton.
Results: No recovery.

Full details of these tests are included as Appendix 4.

Oil and gas analyses were carried out by Amde1 and these results are detailed in Appendix 5.

2.3.9 Well Completion Data

Production tubing 2-3/8", J55 grade, 4.7 lbs/ft, E.U.E. thread was landed at 4893 feet using three centralizers.

The wellhead was made up and the oil base mud displaced with Mereenie crude, and the well completed barefoot from 4591 feet, and flowed for final clean-up.

3. GEOLOGY

3. GEOLOGY

3.1 Previous Work

East Mereenie No. 8 is the fourth appraisal well of the new drilling programme which commenced in January, 1982. Previous drilling of the Mereenie Anticline had established oil and gas accumulations in the Pacoota Sandstone with the best reservoir potential located in the Pacoota P1 and Pacoota P3 units.

East Mereenie No. 6 intersected the oil column in the Pacoota P1 unit, below the previously established oil/water contact. Information obtained from East Mereenie No. 6, showed that the Pacoota P2 unit could have acted as a permeability barrier forming a separate oil reservoir in this section of the field. East Mereenie No. 8 was planned to test the updip extent of the Pacoota (P1) oil column found in East Mereenie No. 6.

3.2 Stratigraphy

East Mereenie No. 8 spudded in Parke Siltstone and, at T.D. 4942 feet, was 30 feet into the Pacoota (P2) Sandstone unit. For a list of formation tops and thicknesses see Table 1.

A detailed description of the lithology is appended (Appendices 1 and 2) and is graphically shown and briefly described on the Composite Well Log and Mud Log (Enclosures 1 and 2).

The stratigraphic units penetrated are described below :-

Parke Siltstone

Depth: Surface to 665 feet.

Thickness: 645+ feet.

Age: Devonian.

Lithology:

Surface to 665 feet

This section consists of a sedimentary sequence of interbedded shales, siltstones and sandstones, with siltstones predominating. The siltstones range through various shades of brown, are moderately indurated and slightly calcareous particularly in the more arenaceous bands. Mica and gypsum are also present in minor amounts but with an erratic distribution. The sandstones are white, orange, pink to red brown, fine to medium grained, angular to sub-rounded, and poor to moderately sorted. They are argillaceous with minor calcareous cement and range from unconsolidated to moderately cemented. The shales are dark green to grey green, indurated, blocky to subfissile and slightly calcareous. They occur only towards the top of the intersected sequence.

TABLE 1

EAST MEREENIE NO. 8 STRATIGRAPHIC TABLE

AGE	FORMATION	DEPTH (ft)		THICKNESS (ft)
		KB (ft)	MSL (ft)	
DEVONIAN	PARKE SILTSTONE	SURFACE	+2342	645+
DEVONIAN-SILURIAN	MEREENIE SANDSTONE	665	+1697	1638
UPPER ORDOVICIAN	CARMICHAEL SANDSTONE	2303	+ 59	232
MIDDLE ORDOVICIAN	STOKES SILTSTONE	2535	- 173	1027
	Upper Stokes Siltstone	2535	- 173	787
	Lower Stokes Siltstone	3322	- 960	240
	STAIRWAY SANDSTONE	3562	-1200	791
	Upper Stairway Sandstone	3562	-1200	196
	Middle Stairway Sandstone	3758	-1396	385
	Lower Stairway Sandstone	4143	-1781	210
LOWER ORDOVICIAN	HORN VALLEY SILTSTONE	4353	-1991	211
	PACOOTTA SANDSTONE	4564	-2202	378+
	P1 Unit	4564	-2202	348
	P2 Unit	4912	-2550	30+
	TOTAL DEPTH	4942	-2580	

Mereenie Sandstone

Depth: 665 to 2303 feet.

Thickness: 1638 feet.

Age: Upper Silurian to Middle Devonian.

Lithology:

665 to 1780 feet

This thick sandstone interval contains distinct orange to orange red, fine to medium grained, subrounded, well sorted grains throughout. The sands are weakly cemented, siliceous and calcareous, and predominantly unconsolidated with good porosity forming excellent aquifers; water inflow was noted from approximately 640 feet, also at 720 feet, 760 feet (50 - 100 bbls/hr), 880 (250 bbls/hr), 1390 (250 - 300 bbls/hr)

The sand grains can be clear or frosted also faceted and fractured, angular and rounded, whilst minor pink, tan, white and red grains also occur suggesting aeolian depositional uniformity for the bulk of the Mereenie sands, with sudden environmental changes of short duration providing a complex variety of depositional parameters.

1780 to 1930 feet

This sandstone unit is extremely hard and quartzitic. The grains are white to clear, fine to medium grained, siliceous and well cemented. Traces of kaolin were recorded in one sample. Water inflow at 1780 feet was estimated at 500 bbls/hr.

1930 to 2303 feet

The basal section contains multicoloured white, orange to red, fine grained, subangular to subrounded, moderately cemented, silicified poor porosity sandstone; with interbedded shale and siltstone, brown to red brown, subfissile, moderately indurated, with minor amounts of mica and carbonate.

Carmichael Sandstone (Larapinta Group)

Depth: 2303 to 2535 feet.

Thickness: 232 feet.

Age: Upper Ordovician.

Lithology:

The dominant lithology is a distinctly coloured brick red sandstone, with minor dark orange, brown, pink and white sandstones, fine to medium grained, poorly to moderately sorted, well cemented, argillaceous, slightly calcareous. Interbedded with brick red to

Carmichael Sandstone (Larapinta Group) (Contd.)

dark brown, hard, subfissile shales and siltstones, slightly calcareous and micaceous. Poor porosity throughout, with decreasing sand content with depth.

Stokes Siltstone (Larapinta Group)

Depth: 2535 to 3562 feet.

Thickness: 1027 feet.

Age: Middle Ordovician.

Lithology:

2535 to 2840 feet (Upper Stokes Siltstone)

This unit consists of interbedded sandstones, siltstones and shales with sandstones and arenaceous siltstones predominating. Sandstones are white, pink to light red, fine grained, well sorted, subrounded, quartzose with argillaceous and silty matrix and poor porosity. Siltstones are dark brown to brick red, hard, blocky to subfissile, arenaceous to argillaceous, slightly calcareous and locally micaceous; they grade into a subfissile shale with similar characteristics.

2840 to 3322 feet (Upper Stokes Siltstone)

This interval shows a transition from a red brown argillaceous interbedded shale - siltstone sequence at the top, to a grey green, micaceous, calcareous interbedded shale siltstone unit at the base.

3322 to 3562 feet (Lower Stokes Siltstone)

This basal section contains thin beds of grey green dolomitic limestones interlayered with grey green dolomitic shales and siltstones.

Stairway Sandstone (Larapinta Group)

Depth: 3562 to 4353 feet.

Thickness: 791 feet.

Age: Middle Ordovician.

Lithology:

3562 to 3758 feet (Upper Stairway Sandstone)

Predominantly an off white, fine grained, subangular to subrounded, quartzose, poor porosity sandstone having a calcareous and siliceous cement; interbedded with minor grey to brown siltstone and shale, finely micaceous, moderately calcareous, subfissile to fissile and ranging in composition from finely arenaceous to argillaceous.

3758 to 4143 feet (Middle Stairway Sandstone)

Medium to dark grey, dolomitic siltstones grading to shaley siltstones form this unit. They are subfissile, finely micaceous and contain thinly interbedded, sub-angular fine grained, off white, slightly dolomitic sandstones having very poor porosity.

4143 to 4353 feet (Lower Stairway Sandstone)

Distinct clear white, fine to medium grained, moderately sorted, occasionally coarse grained, subrounded sandstones characterise this interval. Narrow beds of coarse rounded grains exhibit fair porosity, although overall porosity is fair to poor. Pitting and frosting are common, especially on the larger grains. Dark brown residual hydrocarbon staining was noted in the bottom sand. Arenaceous grey siltstones, micaceous, with minor amounts of carbonate and dolomite, occur as interbeds throughout.

Horn Valley Siltstone (Larapinta Group)

Depth: 4353 to 4564 feet.

Thickness: 211 feet.

Age: Lower Ordovician.

Lithology:

The Horn Valley Siltstone is composed of thinly bedded silty shales, brown to grey, micaceous, calcareous, indurated, subfissile to fissile. Minor interbedded, fine grained, calcareous, light brown, quartzose sandstones grading to siltstone, occur throughout, together with thin limestones, the latter increasing with depth to form a distinct basal unit.

Pacoota Sandstone (Larapinta Group)

Depth: 4564 to 4942 feet.

Thickness: 378+ feet.

Age: Lower Ordovician.

Lithology:

4564 to 4912 feet (Pacoota P1 Unit)

An arenaceous limestone has been used to define the top of the Pacoota Sandstone.

The Pacoota (P1) unit has an arenaceous lithology interspersed with thinly bedded siltstones and shales. The sandstones display wide variations in grain size, silicification, porosity and permeability, however the majority are fine grained, glauconitic, quartzose and very silicified, with poor porosity and permeability.

4564 to 4912 feet (Pacoota P1 Unit) (Contd.)

A churned lithology and evidence of bioturbation are common within the sandstones whilst the more porous sandstones are commonly composed of medium to coarse, subrounded grains with a decrease in silicification.

Correlation of individual sandstone beds shows that they have a wide lateral distribution, with only minor variations in thickness, indicating deposition onto a planar surface, under uniform load conditions. Correlation with East Mereenie No. 2 and East Mereenie No. 6 drilled on crestal positions 1.8 miles northwest and 1.25 miles southeast is excellent.

Four cores were cut over the following intervals 4635.8 - 4645.5 ft, 4660 - 4690.7 ft, 4785.7 - 4817 ft, 4842.5 - 4854.2 ft. Each core displayed similar characteristics, namely a bioturbated, churned sandstone siltstone lithology and containing varying amounts of shale laminae often contorted but orientated either horizontally to the bedding or subparallel to occasionally developed low angle cross stratification structures. Interbedded with the sandstones and siltstones are cleaner, grey, white sandstones, fine to medium grained, subrounded, quartzose with varying degrees of silicification. Bedding and cross bedding structures are common, delineated occasionally by wispy shale and silt laminae.

Individual units rarely exceed ten feet in thickness, and are generally between four and eight feet thick. Vuggy porosity is occasionally developed in the cleaner sandstones, as are thin layers of hard quartzitic sandstone.

4912 to 4942 feet (Pacoota P2 Unit)

Only the upper thirty feet of this unit was intersected. An increase in siltstone and shale content is characteristic, with the sandstone being fine grained, siliceous and argillaceous in part. Sandstones varied in colour from white to dark grey to brown. Porosity is poor to very poor, and some black residual hydrocarbon staining was noted.

3.3 Petroleum Geology

Upper Stairway Sandstone (3562 to 3758 feet)

This arenaceous unit shows poor porosity and permeability characteristics consistent with information obtained from adjacent wells. Minor orange fluorescence (< 5%) associated with carbonate was recorded between 3590 to 3620 feet.

Middle Stairway Sandstone (3758 to 4143 feet)

Predominantly a silty shale, this unit contains some carbonaceous detritus, and effectively separates the generally more porous Upper and Lower Stairway Sandstone Formations.

Lower Stairway Sandstone (4143 to 4353 feet)

Two sandstone zones make up this unit, separated by a central silty formation. The upper sandstone flared gas for 20 minutes from the 'blooey' line, but the gas was too small to measure. Porosity is moderate between 4160 and 4220 feet. In the basal sandstone, high pressure gas was intersected between 4290 and 4294 feet, and moderate to good porosity was recorded over the interval 4280 to 4294 feet. Stabilised gas flow from this interval measured 7.29 Mmcf/day. A small amount (approx. 110 ml) of clear condensate was recovered. The flare was clean with an absence of black smoke.

Pacoota Sandstone (P1 unit, 4564 to 4912 feet)

In general most of the sandstone zones show poor porosity and permeability, as a result of infilling primary intergranular porosity by diagenetic silica, and to a lesser extent carbonate cements. Where this siliceous pervasion has been restricted or its effect reduced, porosity accordingly improves. This improvement can be substantial.

The interval 4641 to 4646 feet has excellent porosity and permeability. Core analysis shows a maximum porosity of 15% and permeability of 315 md from 4642.3 feet. These reservoir parameters are evident in the results of drill stem tests 2 and 3B where flows of 540 and 548 BPD of oil were measured. This sandstone unit shows the same resistivity character as it did in East Mereenie No. 6.

Apart from this interval, 4641 to 4646 feet, the electric logs show numerous sandstone horizons with porosity in the range of 5% or less distributed evenly throughout the unit. Core analysis shows that rare very thin horizons may have up to 7.2% porosity.

However, drill stem test Nos. 1, 4, 5 and 6 show that all these intervals have poor to very poor permeability and this is confirmed by core analysis where available. Few of the samples tested show permeabilities greater than 1 md and all are below 5 md.

The presence of hydrocarbons is evident from cuttings, cores and drill stem tests throughout the whole unit. Drill stem tests Nos. 1, 2, 3B and 4 all show evidence of oil being the connate fluid. Neither the gas/oil nor oil/water contact was detected in the P1 unit.

Pacoota Sandstone (P2 unit, 4912 to 4942 feet)

Only the top 30 feet of this unit was intersected. Poor permeability and very low porosities confirmed earlier observations that this section has no significant hydrocarbon potential.

3.4 Relevance to the Appraisal Programme

East Mereenie No. 8 was located 1.25 miles west of East Mereenie No. 6, to test the updip extension of the new oil pool in the Pacoota Sandstone (P1 unit) discovered in East Mereenie No. 6.

The well achieved this primary objective, and drill stem test Nos. 2 and 3B, flowed oil to surface at a measured flow rate of 540 and 548 BOPD respectively. The oil was recovered from the same sandstone interval as East Mereenie No. 6, and has a similar colour. Also the sandstone has the same excellent porosity (15%) and permeability (up to 315 md) as the reservoir in East Mereenie No. 6.

The following points are relevant to the ongoing appraisal programme.

- (1) A gas flow of 7.29 Mmcf/d was encountered in the Lower Stairway Sandstone.
- (2) The good reservoir unit in East Mereenie No. 6 and the new oil pool extends at least 1.25 miles west and approximately 200 feet updip from East Mereenie No. 6.
- (3) Neither the gas/oil nor oil/water contact has been positively detected for the P1 "new oil" pool.
- (4) The known oil column in the P1 "new oil" pool ranges from 4846 feet (-2484 feet M.S.L.) in East Mereenie No. 6 to 4641 feet (-2279 feet M.S.L.) in East Mereenie No. 8, some 205 feet.

Results from East Mereenie No. 6 where a tentative oil/water contact is at 5100 feet (-2187 feet M.S.L.) indicate a column of 538 feet is possible.

- (5) All the major sandstone units of the P1 in East Mereenie No. 6 are present and of similar thickness in East Mereenie No. 8.
- (6) As in East Mereenie No. 6 all of the P1 sandstone units, except for the one referred to as the Upper P1 reservoir unit are poorly permeable.
- (7) The P1 sandstone unit at 4360 feet in East Mereenie No. 2 which produced 1.3 Mmcf/d gas on a drill stem test is very poorly permeable and reduced in thickness in East Mereenie No. 8.