Marathon Petroleum Company (Norway)

FINAL GEOLOGICAL REPORT

25/4-7
Kneler

Marathon Petroleum Company (Norway)

July, 2003

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Table of Contents

Figures and Tables

1. Summary

General Well Data

Well Name:	25/4-7 Kneler
Licence:	PL203
Partner Group:	65% Marathon Petroleum Company (Norway) 20% Norsk Conoco 15% DNO
Location:	West of Heimdal, Norwegian CS
Surface Location:	
Latitude:	59º 32' 52.1522" N
Longitude:	002º 01' 10.9092" E
UTM mE:	444575.08
UTM mN:	6601616.80
Source:	Thales GeoSolutions, Final Position Fix – Differential GPS
Bottom Hole Location:	
Latitude:	59º 32' 51.2974" N
Longitude:	002º 01' 10.3622" E
UTM mE:	444566.10
UTM mN:	6601590.48
Source:	Halliburton Sperry-Sun MWD surveys
UTM Coordinates:	Datum = ED50, Projection = Zone 31N, CM = 3° E
Water Depth:	119.0m
RT Elevation:	23.0m
Total Depth	Driller: 2286m MD -2262.5m TVDSS Logger: 2242m MD -2218.5m TVDSS
Formation at TD:	Paleocene, Heimdal Sandstone.
On location:	20:30, 19th March 2003
Spud:	21:30, 21st March 2003
TD:	07:30, 7th April 2003
Operations Completed:	16:00, 17th April 2003
Moved off location:	03:00, 18th April 2003
Status:	Temporarily Abandoned Oil Discovery

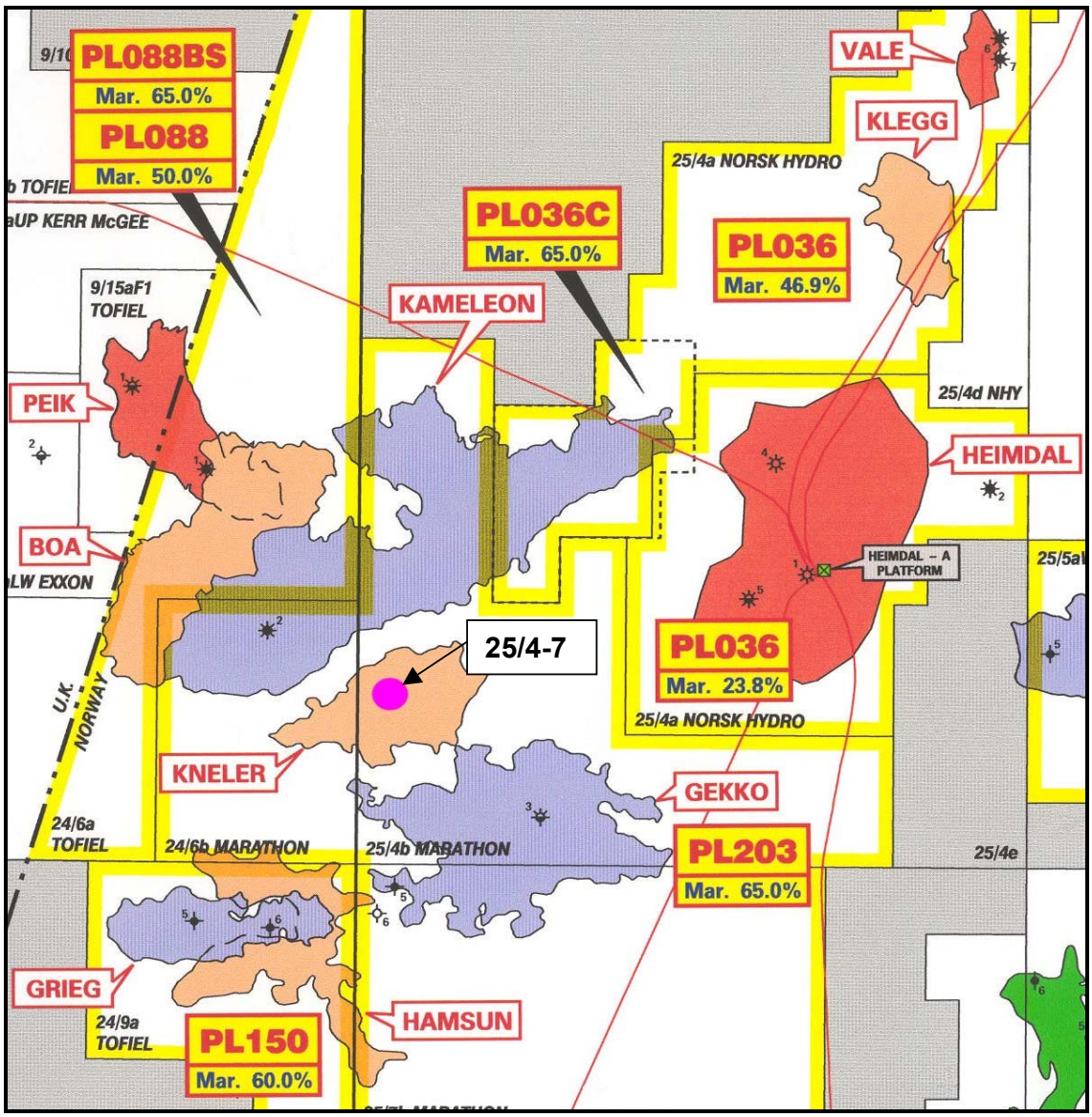
Drilling Data

Drilling Contractor:	Odfjell Drilling
Rig:	Deepsea Bergen
AFE /SAP WBS Number:	DE.02.07913.CAP.DRL

Well Objective

Kneler well 25/4-7 (Figure 1) was designed as an exploratory test of an irregular 4-way closure which lies midway between the Kameleon structure (discovered by well 24/6-2 in 1998), and the Gekko structure (discovered by well 25/4-3 in 1974), which found a thin hydrocarbon column. The reservoir target was the Paleocene Heimdal formation, which is made up of a series of massive to interbedded sandstones, comprised of stacked turbidite sands deposited in a basin-floor setting. Structural closures in which hydrocarbons are contained were thought to have originated from local structural inversion and/or compaction of the Heimdal section. Well 25/4-7 Kneler was designed to provide local structural control to reduce uncertainty in field size and also provide stratigraphic control, particularly the position and character of the T57 shale horizon at the base of the Upper Heimdal reservoir.

Figure 1 – Well Location



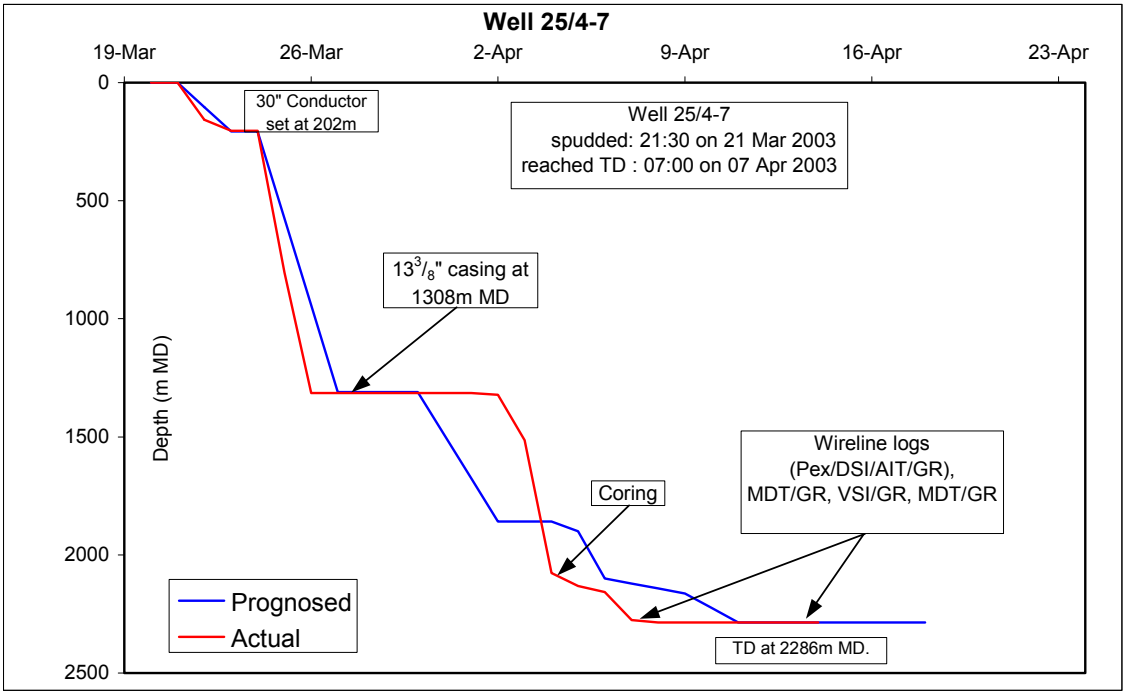
2. Drilling and Engineering Summary

The well 25/4-7 Kneler took a total of 29.27 days to drill, evaluate and temporarily abandon. The well spudded at 21:30 hrs on 21st March 2003 and reached TD of 2286m MD at 07:30 hrs on the 7th April 2003. The well was logged and a total of 3 cement plugs and one bridge plug were set before the well was temporarily abandoned as an oil discovery. More detailed treatment of drilling operations is presented below in sections 2.1 to 2.3 inclusive or in the drilling End of Well Report. A well operations progress plot is presented below in Figure 2.

Table 1 – 25/4-7 Kneler Chronological Drilling Data

Date	Days Since Spud	06:00 Depth (m)	Daily Progress (m)	Operation
20 Mar				Tow rig from Sandnes
21 Mar				Complete tow to location at 16:30 20 Mar, run anchors, ballast rig.
22 Mar	1	157	157	Prepared equipment for drilling, spud 25/4-7 at 21:30, drilled 36" hole to 157m.
23 Mar	2	204	47	Drilled to 160m, repositioned rig, drilled to 204m, POOH, ran 30/20" casing.
24 Mar	3	204	-	Ran/cemented 30"/20" at 202m, recovered CART, RIH 17½" BHA.
25 Mar	4	805	601	RIH, drill cement and shoe, drilled 17½" hole to 805m.
26 Mar	5	1315	510	Drilled 17½" hole to 1315m, pump 16m^3 mud pill, POOH.
27 Mar	6	1315	-	POOH, RIH 13$^3/_8$" casing to 212m, RIH casing washing down where required.
28 Mar	7	1315	-	Unable to run casing below 370m, POOH casing, RIH wiper trip with 17½" BHA.
29 Mar	8	1317	2	Wash/ream to 1315m drill to 1317m, POOH, R/U and RIH 13$^3/_8$" casing.
30 Mar	9	1317	-	RIH 13$^3/_8$" casing to 1273m on 5" DP.
31 Mar	10	1317	-	Wash casing to 1308m, cement casing, POOH 5" DP, WOW for running BOPE.
01 Apr	11	1317	-	WOW to run BOPE, run BOPE and test – OK, P/U 12¼" drilling BHA.
02 Apr	12	1322	5	RIH, drill out shoe, displaced 1.2sg OBM, drilled to 1322m, FIT to 1.5sg, POOH.
03 Apr	13	1515	193	POOH, RIH 8½" BHA, washed to 1322m, drilled 8½" hole to 1515m.
04 Apr	14	2077	562	Drilled 8½" hole to 2077m (preliminary core point), CBU, start POOH, RIH
05 Apr	15	2131	54	Drilled to 2104m, CBU, POOH, RIH core barrel, cut 27m core to 2131m, POOH.
06 Apr	16	2157	26	POOH recover core#1, RIH, cut 26m core to 2157m, POOH.
07 Apr	17	2275	118	Recovered core #2, RIH, washed past cored interval, drilled 8½" hole to 2275m.
08 Apr	18	2286	9	Drilled to TD 2286m, POOH, RIH Pex-DSI-AIT, unable to pass 1373m, L/D logs.
09 Apr	19	2286	-	RIH wiper trip to TD, POOH, RIH Pex-DSI-AIT, unable to pass 1321m, POOH.
10 Apr	20	2286	-	L/D w/line tools, RIH, open hole to 12¼" to 1466m, POOH, RIH Pex-DSI-AIT.
11 Apr	21	2286	-	POOH and L/D w/line, RIH BHA, open hole to 12¼" to 2020m, CBU, POOH.
12 Apr	22	2286	-	POOH, Rih with Pex-AIT, unable to pass2030m, POOH, RIH 8½" BHA to 2240m
13 Apr	23	2286	-	POOH, RIH Pex-DSI-AIT, log from 2242m to shoe, RIH MDT, take 29 pretests.
14 Apr	24	2286	-	MDT - 3 samples, RIH VSI 2191-700m, RIH MDT, attempt VIT at 2110m - no go.
15Apr	25	1180	-	R/D w/line, RIH cement stinger, set plug#1 at 2240-1980m, plug#2 1430-1180m
16 Apr	26		-	RIH 8½" BHA, no cement at 1242m, displace to seawater, plug#3 1383-1183m
17 Apr	27		-	Circulate well clean, test plug to 145bar, RIH FAS plug to 400m, pulled BOPE.
18 Apr	28		-	Retrieved G/base, installed overtrawlable structure on wellhead, ROV check.
Deballasted rig at 16:00 on 17th April 2003, pulled anchors.				

Figure 2 – 25/4-7 Kneler Well Operations Progress Plot



Drilling Operations by Hole Section

36" Hole Section

Well 25/4-7 Kneler was spudded from seabed at 21:30 hrs on 21st March 2003 and was drilled to 204m with varying parameters and number of short trips to circulate the hole clean with cuttings returned to seabed. The 30"/20" casing was run and cemented at 202m without incident.

17½" Hole Section

The 17½" hole was drilled to section TD in one bit run with varying parameters and cuttings returns to seabed. Mud pump downtimes were the only incidents of note during drilling and the well was displaced to 1.2sg bentonite mud before pulling out to run $13^3/_8$" casing. Tight areas of the hole were wiped while pulling out. The first attempt to run casing was aborted at 370m due to tight spots which could not be worked or washed past. A wiper trip with 17½" drilling assembly was made with hole fill and 2m of new formation drilled before the well was displaced again to mud prior to running casing. The $13^3/_8$" casing was successfully run and washed past tight spots down to 1306m and cemented without incident. BOP equipment was successfully installed and tested without incident.

12¼" Hole Section

After drilling out casing and equipment with a 12¼" drilling assembly, the well was displaced to seawater and then displaced to 1.2sg oil based mud. A short, 5m, 12¼" hole was drilled to 1322m and circulated clean before an FIT to 1.5sg was performed.

8½" Hole Section

This section was drilled to TD at 2286m in two bit and two coring runs without significant incident. The first bit run, a Hughes ATX536HA with 6x11/32 nozzles, drilled to coring point in the Heimdal target reservoir at 2104m,determined by cuttings and drilling parameter changes, and was graded 1-1-CT-G-D-I-NO-CP. A total of 53m of core was cut in the Heimdal formation with recovery of 97.7% and the core head, a Security DBS FC274Li, was graded 2-

1-CT-A-D-I-PN-TD. After washing and reaming the cored section, the well was drilled to TD at 2286m in one run and the rerun ATX536HA graded 1-2-CT-G-D-2-WT-TD. A number of attempts were made to get wireline tools to TD and details of these are found in section 5, Wireline logging.

The first attempt to run wireline logs was unsuccessful after tools failed to pass an obstruction at 1373m and a wiper trip was made to clean the hole. During this wiper trip, the bit encountered hole fill at 2252m and it was reamed from that depth to TD and the mud weight increased to 1.3sg. After a further two unsuccessful attempts to run wireline tools, which held up at 1321m, a hole opening run was made with the 8½" hole opened to 12¼" down to 1466m. During this operation the mud weight was increased to 1.33sg as a precaution and the hole circulated clean before pulling out. A further attempt was made to run wireline tools which was also unsuccessful as tools held up at 1321m, the original step between the 12¼" and 8½" holes. The 8½" hole was then opened to 12¼" down to 2020m and the assembly pulled for running a $9^5/_8$" casing. While waiting on weather to unload the casing a further attempt was made to run wireline logs and the tools successfully entered the hole below 1321m but held up at 2030m. Logs were acquired over the openhole section and tools laid down before another wiper trip was made in 8½" to 2242m to clean the hole. Wireline logs were then successfully acquired as per programme. Upon completion of logging, the well was temporarily suspended with three cement plugs and an FAS bridge plug set at 400m before the BOPE was recovered and the wellhead covered with an overtrawlable structure. The rig deballasted and moved off location, commencing at 16:00 on 18th April 2003.

Table 2 – Hole Size and Casing:

Hole Size	Depth (m)	Casing Size	Casing Grade, Weight, Thread Type	Shoe depth (m)
36"	204	30"/20"	X56, 309.7lb/ft	202
17½"	1317	$13^3/_8$"	L80, 72lb/ft	1311
12¼"	1322 [1]			
8½"	2286			

[1] The 8½" hole was opened to 12¼" down to 2020m MD to ensure wireline logging tools were able to reach the reservoir interval following difficulties in tools passing below the original 17½"/12¼" rathole cross-over at 1321-2m.

Deviation Surveys:

Well 25/4-7 Kneler was designed as a vertical 'Finder' well and no directional drilling was planned or undertaken. Surveys were taken using MWD services and the complete list of deviation surveys are presented in Appendix A.

3. Geological Summary

Formation Tops

The following table shows the formation tops and thickness as picked from wireline logs in 25/4-7 Kneler and based on the definitive survey data. The tops are correct as of 30th June 2003.

Table 3 – Formation Tops.

AGE / GROUP FORMATION	DEPTH (m MD)	DEPTH (m TVDSS)	AVT (m)	UTM (mE)	UTM (mN)
Undifferentiated Eocene Hordaland Group					
Grid Sands	1215.5	-1192.4	104.5	444574.1	6601615.0
Base Grid Sands	1320.0	-1296.9	-	444574.7	6601612.5
Rogaland Group					
Balder	1895.0	-1871.6	110.0	444570.6	6601595.0
Balder Tuff	1949.0	-1925.6	56.0	444570.1	6601594.0
Sele	2005.0	-1981.6	33.9	444569.7	6601593.0
Upper Paleocene	2032.0	-2008.6		444569.3	6605192.6
Lista	2038.9	-2015.5	46.0	444569.4	6601592.5
Heimdal Sandstone, Z1	2084.5	-2061.5	201+	444568.9	6601592.5
Z2	2171.3	-2147.8	32.3	444567.9	6601591.5
Z3	2197.0	-2173.5	-	444567.7	6601591.5
T.D. (Driller) (Logger, did not tag TD)	2286.0 2242.0	-2262.5 -2218.5		444566.1	6601590.5
- SLM confirmation of drillers depth made before wireline logging. - Formation tops based on correlation with offset wells, principally 25/4-3 and 24/6-2, - TVDSS values calculated using the Minimum Curvature method.					

Lithostratigraphy

The lithology encountered in 25/4-7 Kneler has been defined both biostratigraphically and chronostratigraphically in offset wells (24/6b-2, 24/6a-1, 25/4-3, 25/7b-5). Drilled cuttings samples were collected in 25/4-7 Kneler to determine the correspondence of the exploration well to the regional lithologies.

Well 25/4-7 Kneler spudded in seabed sand and clays corresponding to Quaternary Pleistocene deposits. The well was drilled with seawater and returns to seabed in the 26" and 17½" sections to 1317m MD so no ditch cuttings could be collected. The formations in this upper interval are inferred from a through casing gamma ray log and the interpreted stratigraphy provided by Fugro Survey AS as part of the site survey. No detailed descriptions for these lithologies is available for this report.

The interval from 1320m MD to 2032m MD (~1300m to ~2009m TVDSS) comprises Eocene age sediments and is dominated by claystones with minor intercalations of limestone. Below

the base of the Grid Sands at 1320m MD, two principal types of claystone were recognized in ditch cuttings. The first was olive black to dark grey/greenish grey, firm to moderately hard, sub-blocky to blocky, silty in part and with rare very fine quartz sand grains. This grayish black claystone was variably micromicaceous and micropyritic throughout with traces of carbonaceous material and was predominantly non calcareous to rarely very weakly calcareous in part.

The second type of claystone was bluish grey, firm to moderately hard, blocky to platy in part, rarely glauconitic and non calcareous and was noted from approximately 1800m MD to the top of the Balder formation. Intercalated limestones were mudstone, predominantly pale orange to yellowish grey, firm to hard, cryptocrystalline, locally argillaceous and with rare floating quartz sand grains. Towards the base of this interval, the argillaceous limestones became marly and locally very silty. No visible porosity or hydrocarbon shows was noted from these limestone stringers.

A subtle colour change in the claystone to a medium to dark grey type was noted at the top of the Balder (1895m MD / –1871.6m TVDSS) and the claystone became increasingly calcareous. At 1949m MD (–1925.6m TVDSS) the claystone became tuffaceous, corresponding to the Balder Tuff down to the top of the underlying Sele at 2005m MD (-1981.6m TVDSS). This claystone was medium to dark grey and mottled with black and white specks, firm to moderately hard, silty and locally very sandy in part. The tuffaceous claystone was typically non- to slightly calcareous but locally became very calcareous grading to argillaceous limestone in part. Wireline logs across the Balder Tuff show a characteristic reduced sonic transit time and increased variability in resistivity responses compared to the overlying Eocene claystones.

The Lower Eocene/Upper Paleocene Sele Formation was only thinly developed at the Kneler location (from 2005m to 2038.9m MD). The claystone was predominantly olive black, firm to moderately hard, sub-blocky to platy, locally silty, rarely micromicaceous, microcarbonaceous and non- to very slightly calcareous. Traces of tuffaceous claystone were noted in this interval and these were indistinguishable from those of the overlying Balder Tuff. The boundary between the Lower Eocene and the Upper Paleocene is considered to be at 2032.0m MD (–2008.6m TVDSS).

Upper Paleocene Lista Formation claystones were present in the 25/4-7 well (2038.9m to 2084.5m MD / –2015.5m to –2061.5m TVDSS) and these were uniformly dark greenish grey to greenish black, firm to moderately hard, sub-blocky to blocky, locally glauconitic and non calcareous. There was no evidence (ditch cuttings, wireline logs) to indicate the presence of sands of the Hermod formation at this location.

The Upper Paleocene Heimdal Formation sandstone was penetrated from 2084.5m to TD at 2286m MD. Within this interval, a total of 53m of core was cut (refer to Table 9 and Appendix G for details). The Heimdal Formation at this location consists of an upper, heterolithic dominated sequence down to 2105.5m MD and more massive sandstone below that depth. In ditch cuttings, the sandstone was seen predominantly as disaggregated loose quartz sand, light greyish brown to clear, translucent, variably fine to very coarse grained locally cobble, subangular to subrounded and moderately sorted. Where seen as whole cuttings, the sandstone had a rarely kaolinitic matrix and was variably calcite cemented with locally inferred calcitic ‘hardbands’. Silt and carbonaceous material was common as accessories and visible porosity was generally good to excellent. Hydrocarbon shows were typically a strong petroliferous odour, pale to dark yellowish brown oil stain, bright white to bluish white direct fluorescence with an instant bright white to bluish white cut, no cut colour and only a very light yellowish brown residue. As the hydrocarbon column was cored, no reliable total gas or chromatographic gas breakdown was achieved over the interval 2104m to 2157m MD.

Interbedded claystone within the massive sandstone section was predominantly greenish grey, moderately hard to hard, blocky to platy, micromicaceous, rarely micropyritic and non-calcareous.

Detailed Biostratigraphy and Geochemistry was performed on the samples and core material taken in 25/4-7 and the results are presented by the contractors in their reports. Biostratigraphal analysis was performed by Ichron Ltd. and Geochemical analysis by IGI Ltd. The results of these studies were not available for inclusion at the time of writing this report.

Sample Integrity

Drilled cuttings were adversely affected by the use of PDC bits, especially in the sandstone intervals, and hydrocarbon shows were affected by the use of oil-based mud in the 8½" hole section. No problems were noted with drilled cuttings sampling other than some over-representation of sand as a result of caving.

4. Hydrocarbon Shows

Gas and Shows Record

Table 4 – Significant Gas Peaks

MD (mRKB	Total Gas	Bckgd.	Net Gas	Type	C1	C2	C3	iC4	nC4	iC5	nC5
From- to	%	%	%		ppm	ppm	ppm	ppm	ppm	ppm	ppm
Formation Gas											
2084	0.36	0.05	0.31	D	2969	208	55	11	14	44	
2124	3.70			TG	31140	1959	360	74	52	39	
2157	0.15			TG	1073	103	28	7	5	10	

Types: S=Show, D=Drilled Gas, TG=Trip Gas, STG=Short Trip Gas, CG=Conn. Gas, BG= BG Chrom. Gas, P=Gas Peak

Refer to section 5, Mudlogging Performance Evaluation comments for caveats concerning drilled gas data quality.

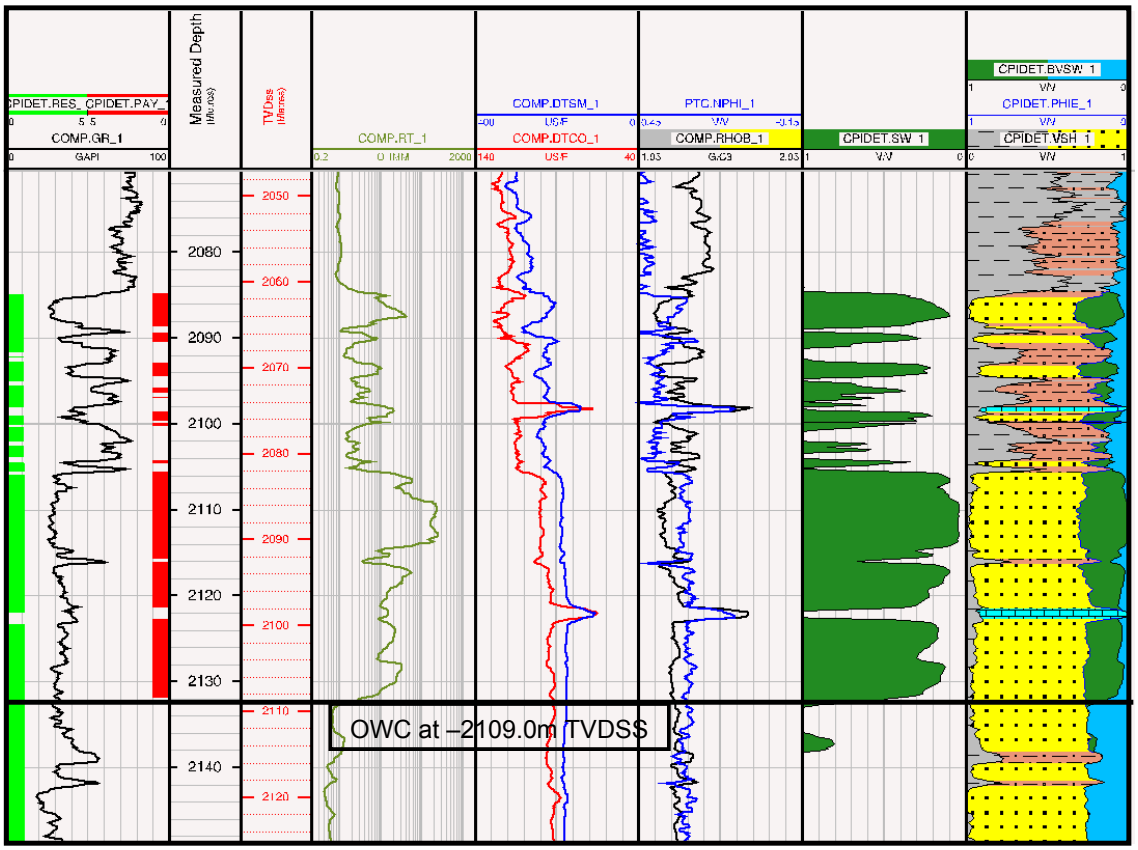
Table 5 – Shows Table

Depth (m) from - to	Formation / Lithology	Show description
2080-2104	Very fine to fine grained Sandstone Siltstone	Tr dull yel dir Fluor, slo blmg pl bl wh fluor cut, no vis cut, pl bl wh fluor Res ring, no vis Res ring. Tr brt bl wh dir flu in sltst, brt bl wh crush cut.
2104-2130	Sandstone	Strg Pet od, pl-dk yel brn O stn, brt wh-bl wh dir fluor, inst brt wh-bl wh cut fluor, no vis dir cut, brt bl wh fluor Res, v lt yel brn vis Res
2132-2137.5	Sandstone	Mod Pet od,no O stn, pl yel dir Fluor, inst bl wh fluor cut, no vis cut, pl bl wh fluor Res, no vis Res

Preliminary Petrophysical Interpretation

Preliminary petrophysical evaluation of wireline logs acquired demonstrates the Heimdal Sandstone to be oil-bearing at this location with an oil-water contact (OWC) placed at 2132.5m MD / –2109.0m TVDSS. This is consistent with shows described from core and cuttings within the Heimdal. Figure 3 below shows a preliminary interpretation and this is included for guidance only as the definitive interpretation will be incorporated in the Discovery Report, issued under separate cover.

Figure 3 – 25/4-7 Kneler Preliminary Petrophysical Interpretation



5. Formation Evaluation

Formation evaluation was provided on the 25/4-7 Kneler well by Halliburton SDL (using a standard computerized mudlogging unit) and wireline logs were run by Schlumberger at TD.

Mudlogging and Sampling

Halliburton SDL provided reports, paper log copies and digital log data files as required and at the request of the wellsite geologist. The mudlogging unit provided 24 hour monitoring of the drilling operation and recorded all drilling parameters on a real time basis. Drilling support using standard computer packages was provided as requested. Formation and mud samples were collected as per the Geological Program and samples were shipped from location at the end of the well (Appendix B).

Performance Evaluation

Halliburton SDL gas equipment was problematical throughout the well with the main cause of problems related to the design of the flowline on the rig Deepsea Bergen. It proved difficult to position a traditional gas trap type system within the closed flowline set-up and the 'work-around' installation frequently caused problems through plugging with cuttings/mud products. A new gas trap was installed during this well but neither the old nor the new functioned satisfactory all the time. Consequently it proved impossible to use the gas readings for correlation purposes or accurate correlation with the top of the reservoir.

In addition, the cycle time for the chromatograph was 3 minutes, an unacceptably slow time with fast rates of penetration. As a result the chromatograph gave a point value approximately every 2 - 3m. This limited the utility of the data provided and rendered ratio analysis of little benefit; this was unfortunate as the reservoir was anticipated to contain both gas and oil.

An initially poor level of communication between the senior data engineers and Marathon wellsite geologists was resolved offshore and subsequent support of the geology operation was adequate to good.

Wireline Logging

Schlumberger provided the wireline logging service on 25/4-7 Kneler. Three suites of logs were run with formation sampling at three separate depths within the reservoir. A summary of logging efficiency is provided in Table 8 with a more detailed breakdown of wireline operations presented in Appendix D.

Table 6 – Summary of Wireline Logging Runs

Log Run	Logger's TD (m)	Logged Interval (m)	Max. BHT(°C)	Therm. Depth(m)
Run 1A – PEX DSI-AIT	1373	1373 – 1306	n/a	n/a
Run 1A – PEX DSI-AIT	1321.5	-	n/a	n/a
Run 1A – PEX DSI-AIT	1321.5	-	n/a	n/a
Run 1A – PEX DSI-AIT	2030	2025 – 202	57	2000
Run 1B – PEX DSI-AIT	2242	2235 – 1970	59	2215
Run 2A – MDT-GR	2242	2085.5 – 2157.0	65	2157
Run 3A – VSI-GR	2242	2191 – 750		

Logging operations commenced on the 7th April 2003, lasted 84.33 hours excluding hole opening time and were completed on 14th April 2003. The MDT was configured for pretest pressures, oil sampling and a VIT and with the GR module on the bottom for reservoir correlation. Thirty five pre-test pressures were requested and a total of 31 formation pressures were obtained from 2085.5m to 2157.0m MD following Marathon standard pre-test pressure procedures. The MDT sampling program was also completed satisfactorily with two oil samples and one water sample taken as detailed in Table 7 below.

Table 7 – MDT Sampling

Depth (m MD)	Sample	SPMC	MPSR	Large Volume Chambers
2086.4	Oil	7	3	1 x 2¾ gal, 1 x 6 gal.
2110.0	Oil	8	4	1 x 18 gal
2144.7	Water	1	1	1 x 1 gal

Table 8 – Logging Efficiency Analysis

Log Run	Log Speed (ft/hr)	Logged Interval (m)	Total Time Hrs:mins	Lost Time Hrs:mins	Efficiency %
Run 1A – PEX DSI-AIT	1200	1373-1306	5:50	-	100
Run 1A – PEX DSI-AIT	1200	-	5:53	1:35	63.3
Run 1A – PEX DSI-AIT	1200	-	6:00	1:15	73.7
Run 1A – PEX DSI-AIT	1800	2025 – 202	6:55	-	100
Run 1B – PEX DSI-AIT	1200	2235 – 1970	8:20	-	100
Run 2A – MDT-GR	n/a	2085.5 – 2157.0	17:25	0:30	97.1
Run 3A – VSI-GR	n/a	2191 – 750	4:53	-	100

Performance Evaluation

Schlumberger carried out wireline operations in a safe manner and without incident. The following should be noted for future reference. No spectral GR tool was available at the wellsite when wireline operations were first initiated, contrary to requirements laid out in the Kneler Data Acquisition Program (DAP). A spectral GR tool was shipped to the rig separately and a log obtained on the final runs, at least three days after wireline operations were first started. The contractor should ensure all tools required are at the wellsite prior to commencement of logging.

Coring Operations

Halliburton provided the coring services on 25/4-7 Kneler and ResLab in Stavanger provided surface core handling operators prior to transport and core analysis in Stavanger.

Table 9 – Summary of Core Information

Core N°.	From (m)	To (m)	Cut (m)	Rec. (m)	%	Core-Log shift (m)	Corehead / TFA
1	2104	2131	27	25.77	95.4	+1.70	DBS FC274Li / 1.55
2	2131	2157	26	26.00	100.0	+1.15	DBS FC274Li / 1.55

Performance Evaluation

Coring operations were carried out in a safe and efficient manner and core recovery was excellent (51.77 recovered from 53m cut, 97.7%) in the friable sandstone of the Heimdal formation. Surface handling by Halliburton personnel using the cradle recovery system was performed well and core damage was minimal during surface operations. The core was stabilized before transport using Reslab's Gypsum Stabilisation techniques. Before opening and examination, the core was CT scanned and the results suggest the stabilization agent performed well.

Core Analysis Evaluation

Core handling, storage, routine and special core analysis has been performed by Reslab in Stavanger and Bergen. Routine data that was acceptable to Marathon standards was obtained in a timely manner and SCAL is in progress and incomplete at the time of writing this report. Core handling and storage has been performed to Marathon standards.

Appendix A – Directional Surveys

The following directional parameters were used by Sperry-Sun for the well.

Grid Coordinate System: UTM Zone 31N on ED50 Datum, Meters
Location Lat / Long: 59º 32' 52.1522" N, 002º 01' 10.9092" E
Location Grid Y/X: 6601616.80m N, 444575.08m E
Grid Convergence Angle: -0.845°
Final Coordination data from: Thales GeoSolutions, Final Position Fix – Differential GPS
Date of Survey: 20 March 2003
Survey / DLS Computation Method: Minimum Curvature
Vertical Section Azimuth: 198.843º (Grid)
Vertical Section Origin: N 0.000 m, E 0.000 m
TVD Reference Datum: RTE
TVD Reference Elevation: 23.0 m relative to MSL
Sea Bed / Ground Level Elevation: -142.0m relative to MSL
Magnetic Declination: -2.311°
Declination Date: 27 June 2003
Magnetic Declination Model: BGGM 2003
North Reference: Grid North
Total Corr Mag North -> Grid North: -3.156°
Local Coordinates Referenced To: Well Head

								Grid Coordinates		Geographic Coordinates	
MD (m)	Incl (°)	Azim (°)	TVD (m)	VSec (m)	N/-S (m)	E/-W (m)	DLS (°/30m)	Northing (m)	Easting (m)	Latitude	Longitude
0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	6601616.80	444575.08	59º32'52.15"	002º01'10.91"
142.0	0.00	0.00	142.00	0.0	0.00	0.00	0.00	6601616.80	444575.08	59º32'52.15"	002º01'10.91"
267.3	0.36	293.85	267.30	0.2	0.00	0.00	0.00	6601616.80	444575.08	59º32'52.16"	002º01'10.89"
296.3	0.25	254.02	296.30	0.2	0.16	-0.36	0.09	6601616.96	444574.72	59º32'52.16"	002º01'10.88"
368.3	0.07	143.05	368.30	0.1	0.18	-0.50	0.24	6601616.98	444574.58	59º32'52.16"	002º01'10.87"
441.4	0.32	10.14	441.40	0.3	0.10	-0.63	0.12	6601616.90	444574.45	59º32'52.16"	002º01'10.87"
470.4	0.42	11.41	470.40	0.4	0.27	-0.57	0.15	6601617.07	444574.51	59º32'52.16"	002º01'10.88"
586.5	0.70	338.71	586.49	1.5	0.45	-0.53	0.11	6601617.25	444574.55	59º32'52.15"	002º01'10.86"
615.5	0.75	338.06	615.49	1.9	1.53	-0.70	0.11	6601618.33	444574.38	59º32'52.20"	002º01'10.85"
644.5	0.42	346.27	644.49	2.1	1.87	-0.84	0.05	6601618.67	444574.24	59º32'52.21"	002º01'10.85"
673.5	0.64	7.75	673.49	2.4	2.15	-0.94	0.36	6601618.95	444574.14	59º32'52.22"	002º01'10.85"
702.5	0.69	6.27	702.48	2.7	2.75	-0.90	0.06	6601619.55	444574.18	59º32'52.23"	002º01'10.85"
731.5	0.62	49.61	731.48	3.0	3.02	-0.76	0.51	6601619.82	444574.32	59º32'52.24"	002º01'10.86"
760.6	0.47	78.33	760.58	3.1	3.15	-0.52	0.32	6601619.95	444574.56	59º32'52.25"	002º01'10.87"
789.7	0.22	157.88	789.68	3.1	3.12	-0.38	0.50	6601619.92	444574.70	59º32'52.25"	002º01'10.88"
818.7	0.40	208.00	818.68	3.0	2.98	-0.41	0.32	6601619.78	444574.67	59º32'52.25"	002º01'10.88"
847.7	0.55	213.65	847.68	2.8	2.77	-0.54	0.16	6601619.57	444574.54	59º32'52.24"	002º01'10.87"
905.8	0.64	199.50	905.78	2.2	2.24	-0.80	0.09	6601619.04	444574.28	59º32'52.22"	002º01'10.86"

934.8	0.77	198.98	934.77	1.9	1.90	-0.92	0.14	6601618.70	444574.16	59º32’52.21”	002º01’10.85”
993.0	0.56	270.62	992.97	1.5	1.53	-1.33	0.42	6601618.33	444573.75	59º32’52.20”	002º01’10.82”
1036.0	1.19	180.76	1035.96	1.1	1.09	-1.54	0.93	6601617.89	444573.54	59º32’52.19”	002º01’10.81”
1080.1	1.16	175.74	1080.05	0.2	0.18	-1.52	0.07	6601616.98	444573.56	59º32’52.16”	002º01’10.81”
1123.0	1.20	174.36	1122.95	-0.7	-0.70	-1.44	0.03	6601616.10	444573.64	59º32’52.13”	002º01’10.82”
1152.1	1.19	172.40	1152.04	-1.3	-1.30	-1.37	0.04	6601615.50	444573.71	59º32’52.11”	002º01’10.82”
1167.0	1.22	170.34	1166.94	-1.6	-1.61	-1.32	0.11	6601615.19	444573.76	59º32’52.10”	002º01’10.83”
1196.1	1.19	168.83	1196.03	-2.2	-2.21	-1.21	0.05	6601614.59	444573.87	59º32’52.08”	002º01’10.83”
1225.1	1.16	169.27	1225.02	-2.8	-2.79	-1.10	0.03	6601614.01	444573.98	59º32’52.06”	002º01’10.84”
1283.2	1.63	157.31	1283.11	-4.1	-4.13	-0.67	0.29	6601612.67	444574.41	59º32’52.02”	002º01’10.87”
1361.1	2.56	188.44	1360.95	-6.9	-6.88	-0.50	0.56	6601609.92	444574.58	59º32’51.93”	002º01’10.88”
1392.4	2.49	188.92	1392.22	-8.2	-8.24	-0.71	0.07	6601608.56	444574.37	59º32’51.89”	002º01’10.87”
1422.1	2.10	187.72	1421.90	-9.4	-9.42	-0.88	0.40	6601607.38	444574.20	59º32’51.85”	002º01’10.86”
1449.5	2.20	189.77	1449.28	-10.4	-10.43	-1.04	0.14	6601606.37	444574.04	59º32’51.81”	002º01’10.85”
1477.4	2.18	190.75	1477.16	-11.5	-11.48	-1.23	0.05	6601605.32	444573.85	59º32’51.78”	002º01’10.84”
1506.4	2.22	190.88	1506.14	-12.6	-12.58	-1.44	0.04	6601604.22	444573.64	59º32’51.75”	002º01’10.83”
1651.8	1.71	194.95	1651.45	-17.4	-17.44	-2.53	0.11	6601599.36	444572.55	59º32’51.59”	002º01’10.76”
1681.2	1.68	197.47	1680.84	-18.3	-18.27	-2.77	0.08	6601598.53	444572.31	59º32’51.56”	002º01’10.75”
1739.0	1.46	202.65	1738.61	-19.8	-19.76	-3.31	0.14	6601597.04	444571.77	59º32’51.51”	002º01’10.72”
1768.0	1.41	202.09	1767.61	-20.4	-20.43	-3.58	0.05	6601596.37	444571.50	59º32’51.49”	002º01’10.70”
1797.0	1.41	201.67	1796.60	-21.1	-21.09	-3.85	0.01	6601595.71	444571.23	59º32’51.47”	002º01’10.68”
1942.0	1.00	207.43	1941.56	-23.9	-23.87	-5.09	0.09	6601592.93	444569.99	59º32’51.38”	002º01’10.61”
1970.9	0.98	209.16	1970.46	-24.3	-24.31	-5.33	0.04	6601592.49	444569.75	59º32’51.37”	002º01’10.59”
2000.0	0.84	211.01	1999.56	-24.7	-24.71	-5.56	0.15	6601592.09	444569.52	59º32’51.35”	002º01’10.58”
2058.0	0.66	218.82	2057.55	-25.3	-25.34	-5.99	0.11	6601591.46	444569.09	59º32’51.33”	002º01’10.55”
2204.6	0.92	262.63	2204.14	-26.1	-26.15	-7.68	0.13	6601590.65	444567.40	59º32’51.30”	002º01’10.44”
2286.0	0.92	262.63	2285.53	-26.3	-26.32	-8.98	0.00	6601590.48	444566.10	59º32’51.30”	002º01’10.36”

Appendix B – Mudlogging Details

For complete details of the equipment and service provided please refer to the Mudlogging Contractors Contract.

Mudlogging Company	Halliburton SDL	
Personnel		
INSITE Data Engineers	Terje Fjeldheim, Sven Erik Foyn, John Carmichael, Paula Kelly	
Mudloggers	Øyvind Kindem, Heine Helland	
Base Manager	Svein Magna Osnes	
Sampling		
Unwashed	1 set (1kg): MPC(N) for split to partners and NPD	
Washed and Dried	1 set (envelope)	
Intervals of collection	10 meter intervals from 1320 to 2080m	
	3 meter intervals from 2080 to 2156m	
	5 meter intervals from 2156 to 2286m	
Logs produced		
	Formation Evaluation Log (mud log)	Scale 1: 500
	Engineering Log	Scale 1: 1000
	Pressure Evaluation Log	Scale 1: 2000
	Gas Ratio Log	Scale 1: 1000

Appendix C – LWD and Directional Details

For complete details of the equipment and service provided please refer to the LWD Service Company Contract. No LWD service was provided on this well.

LWD Company	Halliburton Sperry-Sun
Personnel	
MWD Engineers	Terje Fjeldheim
Base Manager	S.M. Osnes
Logs produced	None, directional data only

Appendix D – Wireline Logging Time Breakdown

For complete details of the equipment and service provided please refer to the Wireline Service Company Contract.

Wireline Company	Schlumberger
Personnel	
Wireline Engineers	B. Mitchell, S. Allan
MDT specialist	S. Allan
VSI specialist	D. MacKay
Base Manager	D. Cameron

Date	Time	Lost Time	Operation
			Run 1: PEX-DSI-AIT, run # 1A
7/4-03	19:30		Rig up
	21:30		RIH
	22:23		@ shoe
	22:30		Stopped @ 1373m. Worked string. Could not pass.
	23:15		Opened caliper and logged up into shoe to verify hole condition
	23:22		Stopped logging inside casing and POOH
8/4-03	00:15		OOH, start rig down of Schlumberger
	01:20		Finished rig down
			Total operation time: 5 hrs 50 min
			Lost time: nil
			Run 1: PEX-DSI-AIT, run # 1A (Second aborted run)
8/4-03	22:15		Rig up
	23:35		RIH
9/4-03	00:30	35 min	At shoe. While RIH had problems with telemetry. Found failure in collector box on wire drum. Repaired failure while inside casing.
	01:05		Ran back into open hole. Stopped @ 1321m. Worked string. Could not pass.
	01:38		Logged AIT into casing to verify shoe. Loggers shoe depth preliminary 3.5m shallow.
	01:43		Stopped logging inside casing and POOH to reconfigure toolstring
	02:15		Toolstring at surface, reconfigure toolstring
	03:55		Checked new AITB. Could not calibrate tool. Troubleshooting.
	04:55	1 hr	AITB suddenly started to work
	05:00		Installed radioactive source
	05:10		RIH
	05:52		At shoe, RIH, unable to pass 1321.5m, POOH
	06:30		OOH, start rig down Schlumberger
	07:40		Finished rig down
			Total operation time: 5 hrs 53 min
			Lost time: 1 hr 35 mins
			Run 1: PEX-DSI-AIT, run # 1A (Third time trying to RIH)
10/4-03	00:30		Rig up
	01:45		Telemetry problems, troubleshooting.
	03:00	1 hr 15min	Changed telemetry system for AIT. Problem solved.
	03:20		RIH.
	04:00		Out of shoe, could not pass 1321m.(wireline depth) Worked string.
	04:45		Could not pass 1321m, POOH.
	05:30		OOH, start rigging down

	06:30		Finished rigging down
			Total operation time: 6 hrs
			Lost time: 1 hr 15 mins
			Run 1: PEX-AIT, run # 1A (Forth time trying to RIH)
11/4-03	09:05		Rig up
	10:45		RIH.
	11:30		@ shoe, managed to pass 1321m.(wireline depth) this time.
	11:45		Could not pass 2030m, TD for bit when hole was opened up.
	12:10		Started logging up.
	12:51		@ 1700m, stopped and run down to do repeat log
	12:58		Started repeat from 1750m
	13:12		Finished repeat, continued logging GR and caliper to shoe.
	14:00		Continued logging GR from shoe to 202m.
	14:30		Finished logging GR, POOH.
	15:00		OOH, started rig down
	16:00		Finished rig down
			Total operation time: 6hrs 55 mins
			Lost time: nil
			Run 1: PEX-DSI-AIT, run # 1B (Fifth time trying to RIH)
12/4-03	07:15		Rig up
	09:05		RIH.
	10:00		Start repeat from 2188m
	10:21		Finished repeat at 2070m, RIH
	10:30		At top of fill at 2235m, started logging mainlog up.
	10:39		Stop @ 2200m and run back to try getting deeper.
	10:42		Stopped at 2235m again, started mainlog
	11:13		Finished mainlog @ 1960m with overlap from yesterdays log. Ran down to 2010 to start logging sonic.
	11:19		Continued logging sonic up into casing.
	13:27		Finished logging sonic at 400m, POOH.
	13:55		OOH, started rig down PEX
	15:35		Finished rig down
			Max recorded temp: 59 degr C
			Total operation time: 8 hrs 20 min
			Run 2: MDT-GR, run # 1A
	15:35		Start rig up
	17:00		Trouble with CGA
	17:50		Start RIH
	18:30		@1280m, stabilize tool
	18:48		RIH
	19:05		Start tie in @ 2025m, were 0.8m shallow
	19:07		Finished tie in, RIH
	19:13		@ 2085.5m, start first pressure test
13/4-03	01:15		Completed pressure points, 35 levels, 5 dry, 29 good, pulled back to shoe.
	02:15		Got confirmation on 1st sampling depth, RIH
	02:35		Started pretest before sampling @ 2086.4m
	03:50		Started samling oil in 6 gallon chamber
	04:17		Seal 6 gallon chamber
	04:23		Start sampling oil in 2 ¾ gallon chamber
	04:41		Start sampling oil in MRMS1
	05:25		Completed sampling @ 2086.4m, ran down to 2144.7m and prepared for water sample.
	05:50		Pretest @ 2144.7m
	07:10		Started water sampling @ 2144.7m
	07:30		Water sampling done
	07:35		Start POOH

	09:00		OOH, start rig down
			Total operation time: 19 hrs 25 min
			Lost time: 30 mins
			Run 3: VSI, run # 1A
	11:00		Finished rig down MDT, started rig up VSI
	11:35		Start RIH
	13:17		Start tie in, 1m shallow
	13:19		Finished tie in, RIH
	13:37		At TD, start logging
	15:50		Whole tool inside shoe
	16:30		Noisy when at 750m and above
	16:43		POOH
	17:30		OOH, start rig down VSI
	19:00		Finished rig down
			Total operation time: 8 hrs 00 mins
			Lost time: nil
			Run 4: MDT-GR, run # 1B
	19:20		Start rig up MDT
	20:50		Derrick check MDT, wait on rig compensators
	22:00		RIH
14/4/03	00:20		Start Sampling
	04:35		Sampling completed, start VIT
	08:00		VIT aborted, POOH
	09:45		OOH, after log calibration, flush and check dual probe
	10:15		Start rig down
	12:40		Finished rig down, floor cleared to drilling contractor
			Total operation time: 17 hrs 20 mins
			Lost time: nil
			SUM OPERATIONS TIME: **84.33hrs**
			SUM LOST TIME: **2.83hrs**
			OPERATING TIME – LOST TIME (Logging time): **81.50hrs**
			EFFICIENCY = 1-[LT/(TT-LT)]: **97.0%**

Comments, Problems and Evaluation of Wireline Logging Runs

Run 1 – Pex/DSI/AIT
Run 1: Pex/DSI/AIT, run # 1A2 (Second aborted run)
Had problems with telemetry. Found failure in collector box on wire drum. Some of the electrical wires had their insulation worn off. Repaired same.
Intermittent problem with AITB could be due to contact failure.
Run 1: Pex/DSI/AIT, run # 1A3 (Third time trying to RIH)
Telemetry problem was solved by changing the telemetry system for the AIT tool.
Run 1: Pex/DSI/AIT, run # 1B5 (Fifth time trying to RIH)
Stopped at 2235m due to fill in hole.
Run 2: MDT-GR, run # 1A
Trouble with CGA. It was on the rig for field testing. Had to take out the tool. 0.5 hrs lost.

Log Header Information

Company	Marathon
Well	25/4-7
Field	Kneler
Country	Norway
Location	North Sea
State	
Latitude	59° 32' 52.15" N
Longitude	2° 01' 10.91" E
Rig	Deep Sea Bergen
Permanent Datum	Lowest Astronomical Tide (LAT)
Log Measured From	Rig floor
Drilling Measured From	Rig floor
Elevation: RT	23.0m
: GL	23.0m
: DF	23.0m
Logging Date	12/4, 2003
Drillers Depth	2286m. Fill to 2235m. Not cleaned out during wipertrip.
Casing 30/20”	202m
Casing 13 3/8” (id)	1306m / 12.415”
Hole Size	17½” and 12¼” rathole 8 ½” open hole
Max Well Deviation	2.56deg at 1361 m
Type Fluid in Hole	OBM
Source of Sample	flow line
Density (ppb)	1.33 sg
Viscosity	69
Fluid Loss (HTHP)	3.6
Oil/Water ratio	77/23
pH	
Barite (%, ppb)	11.41%
KCl	
Lost Circulation Material	
Drilling Stopped	07:00 hrs 07/04/03
Circulation Time	4:30 hrs
Time Circulation Stopped	01:00 hrs 12/04/03
RM @ measured temp	N/A
RMF @ measured temp	N/A
RMC @ measured temp	N/A
Witness	S. Bjerkenes
Logging Engineers	B. W. Mitchell
MDT Specialist	S. Allan
VSI Specialist	D. McKay

Appendix E – MDT Details

MDT Pre-test Survey

MDT PRESSURE WORK SHEET								
PreTest Chamber Size: 20 cc, variable					Geologist: Sigvart Bjerkenes			
Probe Type: Large					Engineer: Brett Mitchell / Steve Allan (MDTech)			
Guartz Pressure Gauge serial no: 2541					Ref Log(s): GR/Pex, Run 1A			
#	Depth BRT	Depth TVDSS	Hydro-static before	Hydro-static after	Final shut-in press		Draw-down Perm	Comments 1) Drawdown: 20cc
	(m)	(m)	(bara)	(bara)	(psia)	(bara)	(md/cp)	
1	2085.49	2062.49	281.6388	281.4485	2896.498	199.7585	2127.7	
2	2086.37	2063.37	281.5309	281.3883	2897.496	199.8273	1550.3	
3	2087.49	2064.49	281.5451	281.3133	2898.172	199.8739	1081.3	
4	2089.68	2066.68	281.7108	281.5198	2901.024	200.0706	4.4	
5	2091.98	2068.98	281.9389	281.7902				Dry Test
6	2090.29	2067.29	281.6935	281.5733				Dry Test
7	2093.36	2070.36	282.0828	281.9415	2903.898	200.2688	419.6	
8	2094.00	2071.00	282.0840	281.9742	2904.518	200.3116	85.8	
9	2096.00	2073.00	282.3340	282.2277				Dry Test
10	2096.10	2073.10	282.2986	282.2081	2906.218	200.4288	82.2	
11	2099.29	2076.29	282.7694	282.6594	2907.733	200.5333	919.4	
12	2103.00	2080.00	283.3031	283.2189				Dry Test
13	2103.08	2080.08	283.2424	283.1609	2911.790	200.8131	57.6	
14	2104.40	2081.40	283.3904	283.2953	2912.818	200.8840	84.0	
15	2106.48	2083.48	283.6748	283.5598	2914.883	201.0264	594.1	
16	2107.98	2084.98	283.8136	283.7400	2916.458	201.1350	347.0	
17	2109.99	2086.99	284.1112	284.0144	2918.534	201.2782	4173	
18	2112.00	2089.00	284.3664	284.2816	2920.673	201.4257	2967.6	
19	2114.04	2091.04	284.6199	284.5476	2922.961	201.5835	1473.9	
20	2115.48	2092.48	284.8073	284.7455	2924.389	201.6820	263.2	
21	2116.98	2093.98	285.0143	284.9460	2925.843	201.7823	986.2	
22	2118.49	2095.49	285.2016	285.1440	2927.386	201.8887	509.6	
23	2120.00	2097.00	285.4016	285.3470	2928.932	201.9953	237.8	
24	2123.99	2100.99	286.0277	285.9296	2933.070	202.2807	468.7	
25	2125.99	2102.99	286.2469	286.1762	2935.074	202.4189	219.7	
26	2128.48	2105.48	286.5959	286.5203	2937.706	202.6004	1955.5	
27	2129.99	2106.99	286.7719	286.7067	2939.192	202.7029	1087.7	
28	2131.50	2108.50	286.9391	286.8859	2940.736	202.8094	718.9	
29	2132.48	2109.48	287.0517	287.0047	2941.872	202.8877	429.3	
30	2133.45	2110.45	287.1774	287.1325	2943.203	202.9795	426.0	
31	2135.49	2112.49	287.4772	287.4190	2946.210	203.1869	232.8	
32	2140.48	2117.48	288.2137	288.1288	2953.373	203.6809	216.9	
33	2144.69	2121.69	288.7693	288.6962	2959.528	204.1054	882.1	
34	2147.99	2124.99	289.2068	289.1305	2964.466	204.4459	410.1	
35	2157.00	2134.00	290.5296	290.4110	2977.836	205.3680	909.8	

Appendix F – Enclosure 1 - Completion Log

"Kneler 25_4-7 Completion Log .pdf"

Appendix G – Enclosure 2 – Prognosis and Results Table (NPD Format)

Section: "Well data"	Comments	Keyword name	Comments	If there is more than one prognosis per prospect, please duplicate the prognosis column	
				Prognosis	Result
Well Name	Always fill in	WellName:=	NPD approved name	25/4-7	25/4-7
Production Licence Number	NPD input	ProdLicenseID1=	NPD approved name		
	NPD input	ProdLicenseID2=	NPD approved name		
Operator		Operator=		Marathon Petroleum Company (Norway)	
Well type: required/committed as a part of the licence award?		WellCommitment=	Yes/No	No	
Well classification			Wildcat / appraisal	Wildcat	
License round	NPD input	LicenseRound1=			
	NPD input	LicenseRound2=			
Seismic database (2D/3D)		SeismicDB=	2D/3D	3D	
Frontier area?	NPD input	Frontier=	Yes/No		
Structural element/Province		StrucElement=		NORDSJOEN	
Spud date	NPD input	SpudDate=			
Completion date	NPD input	CompletionDate=			
Water depth		WaterDepth=	meter		119
Stratigraphic age at TD		TDChron=			Upper Paleocene
Paragraph: prospect					
Prospect name	Always fill in	ProspectName:=	Operators name	Kneler	Kneler
Prospect ID	NPD input	ProspectID=	NPD code		
Distance to nearest relevant well		NearestWellDist=	km	3.9	
Nearest well Name		NearestWellName=	NPD approved name	24/6-2	
Prospect Priority if several in well		ProspectPriority=	number 1,2,…	1	
SubParagraph: prognosis // result					
Prognosis ID (if several)		PrognosisID:=	Operators name	Kneler	
Prognosis priority in prospect	(1/2/3…)	PrognosisPriority=	number 1,2,…	1	
Reference(s) to mapping & evaluation		Reference=	Report name etc.	Delineation Well 25/4-7 Data Package (PL203), drilling program	Final Geological Report 25/4-7, Discovery Report 25/4-7
Evaluation year		EvaluationYear=		2002/3	2003
Reference(s) to NPD evaluation	NPD input	NPDReference=			
NPD evaluation year	NPD input	NPDEvaluationYear=			
Data compilation	Date (DD.MM.YY)	DataCompileDate=		01/11/2002	28/07/2003
	Department, Institution	DataCompileDept=		Norway Subsurface	Norway Subsurface
	Name	DataCompileResp=		Jeff Brehm	Jeff Brehm

Data Quality control	Date (DD.MM.YY)	DataQCDate=			
	Department, Institution	DataQCDept=		Norway Subsurface	Norway Subsurface
	Name	DataQCResp=		Jeff Brehm	Jeff Brehm
Comments	Variation from standard methodology	Comments=		No variation from standard methodology	No variation from standard methodology
Geo					
Trap type		TrapType=	Defined numeric code	1.2 Anticlinal traps	1.2 Anticlinal traps
Reservoir stratigraphic level(s)	Chronostratigraphic	ReservoirChron=		Upper Paleocene	Upper Paleocene
Reservoir stratigraphic level(s)	Lithostratigraphic	ReservoirLithos=		Heimdal Fm	Heimdal Fm
NPD play	NPD input	NPDPlay=			
New play	NPD input	NewPlay=			
Inferred source rock 1	Chronostratigraphic	Source1Chron=		UPPER JURASSIC	UPPER JURASSIC
Inferred source rock 1	Lithostratigraphic	Source1Lithos=		HEATHER	DRAUPNE FM
Inferred source rock 2	Chronostratigraphic	Source2Chron=			
Inferred source rock 2	Lithostratigraphic	Source2Lithos=			
Seal	Chronostratigraphic	SealChron=		Lower Tertiary	Lower Tertiary
Seal	Lithostratigraphic	SealLithos=		Undiff'd Hordaland Gp	Undiff'd Hordaland Gp
Probability					
Probability of discovery, technical	Total	ProbTecTotal=	Fraction	0.85	
Probability of discovery, technical	Charge	ProbTecSource=		1.00	
Probability of discovery, technical	Trap	ProbTecTrap=		0.85	
Probability of discovery, technical	Reservoir	ProbTecReservoir=		1.00	
Comments	Comments relevant to risking (DHI, AVO analysis, etc.)	CommentsProbability=		AVO analysis	
Resources					
Main hydrocarbon phase		MainPhase=	OIL, OIL/GAS, GAS	GAS/OIL	OIL
Fractiles, resource parameter ranges	Low/Minimum	FractileResourceLow=	Fraction		
Fractiles, resource parameter ranges	Preferably Mean (or Most likely or Median)	FractileResourceCentral=	Mean/ML/Med		
Fractiles, resource parameter ranges	High/Maximum	FractileResourceHigh=	Fraction		
Gas in place (as main phase)	Low/Minimum	GasMainLow=	10^9Sm3	3.40	
Gas in place (as main phase)	Central/Most likely	GasMainCentral=		11.00	
Gas in place (as main phase)	High/Maximum	GasMainHigh=		33.60	
Oil as associated phase in place	Low/Minimum	OilAssocLow=	10^6Sm3	3.40	
Oil as associated phase in place	Central/Most likely	OilAssocCentral=		12.00	
Oil as associated phase in place	High/Maximum	OilAssocHigh=		36.10	
Oil in place (as main phase)	Low/Minimum	OilMainLow=	10^6Sm3		15.90
Oil in place (as main phase)	Central/Most likely	OilMainCentral=			25.90
Oil in place (as main phase)	High/Maximum	OilMainHigh=			42.10
Gas as associated phase in place	Low/Minimum	GasAssocLow=	10^9Sm3		
Gas as associated phase in place	Central/Most likely	GasAssocCentral=			

Gas as associated phase in place	High/Maximum	GasAssocHigh=			
Gas recoverable (as main phase)	Low/Minimum	RecoverGasMainLow=	10^9Sm^3	2.49	
Gas recoverable (as main phase)	Central/Most likely	RecoverGasMainCentral=		7.85	
Gas recoverable (as main phase)	High/Maximum	RecoverGasMainHigh=		25.72	
Oil as associated phase recoverable	Low/Minimum	RecoverOilAssocLow=	10^6Sm3	1.80	
Oil as associated phase recoverable	Central/Most likely	RecoverOilAssocCentral=		6.10	
Oil as associated phase recoverable	High/Maximum	RecoverOilAssocHigh=		17.20	
Oil recoverable (as main phase)	Low/Minimum	RecoverOilMainLow=	10^6Sm3		5.70
Oil recoverable (as main phase)	Central/Most likely	RecoverOilMainCentral=			10.30
Oil recoverable (as main phase)	High/Maximum	RecoverOilMainHigh=			17.80
Gas as associated phase recoverable	Low/Minimum	RecoverGasAssocLow=	10^9Sm3		
Gas as associated phase recoverable	Central/Most likely	RecoverGasAssocCentral=			
Gas as associated phase recoverable	High/Maximum	RecoverGasAssocHigh=			
Part of prospect in Production Licence		PartInProdLicense=	Fraction	1.00	1.00
Reservoir parameters					
Pressure, top reservoir		PressureReservoir=	bar	198	199.8
Temperature, top reservoir		TempReservoir=	degrees C	68	69
Fractiles, reservoir parameter ranges	Low/Minimum	FractileReservoirLow=	Fraction		
Fractiles, reservoir parameter ranges	Preferably Mean (or Most likely or Median)	FractileReservoirCentral=	Mean/ML/Med		
Fractiles, reservoir parameter ranges	High/Maximum	FractileReservoirHigh=	Fraction		
Depth to top of prospect	Low/Minimum	TopProspectDepthLow=	meters, MSL	2030	
Depth to top of prospect	Central/Most likely	TopProspectDepthCentral=		2040	2050
Depth to top of prospect	High/Maximum	TopProspectDepthHigh=		2050	
Depth to top reservoir in well	Low/Minimum	TopReservoirDepthLow=	meters, MSL, TVD	2030	
Depth to top reservoir in well	Central/Most likely	TopReservoirDepthCentral=		2040	2061.5
Depth to top reservoir in well	High/Maximum	TopReservoirDepthHigh=		2050	
Gross rock volume	Low/Minimum	RockVolLow=	10^9m^3	0.09	
Gross rock volume	Central/Most likely	RockVolCentral=		0.33	0.21
Gross rock volume	High/Maximum	RockVolHigh=		0.99	
Hydrocarbon column height in prospect/ segment	Low/Minimum	HCColProspLow=	meters	50	
Hydrocarbon column height in prospect/ segment	Central/Most likely	HCColProspCentral=		60	47.5
Hydrocarbon column height in prospect/ segment	High/Maximum	HCColProspHigh=		68	
Hydrocarbon column height in well	Low/Minimum	HCColWellLow=	meters	50	
Hydrocarbon column height in well	Central/Most likely	HCColWellCentral=		60	47.5
Hydrocarbon column height in well	High/Maximum	HCColWellHigh=		68	
Area of prospect/segment	Low/Minimum	AreaLow=	Km^2		
Area of prospect/segment	Central/Most likely	AreaCentral=		11.00	12.10
Area of prospect/segment	High/Maximum	AreaHigh=			

Reservoir thickness	Low/Minimum	ThicknessLow=	meters vertical at well position		
Reservoir thickness	Central/Most likely	ThicknessCentral=		46	38.4
Reservoir thickness	High/Maximum	ThicknessHigh=			
Net/gross	Low/Minimum	NetGrossLow=	Fraction		
Net/gross	Central/Most likely	NetGrossCentral=		0.77	0.81
Net/gross	High/Maximum	NetGrossHigh=			
Porosity	Low/Minimum	PorosityLow=	Fraction		
Porosity	Central/Most likely	PorosityCentral=		0.25	0.27
Porosity	High/Maximum	PorosityHigh=			
Water saturation	Low/Minimum	WaterSatLow=	Fraction		
Water saturation	Central/Most likely	WaterSatCentral=		0.20	0.22
Water saturation	High/Maximum	WaterSatHigh=			
Bg	Low/Minimum	BgLow=	decimal number		
Bg	Central/Most likely	BgCentral=		0.00	
Bg	High/Maximum	BgHigh=			
1/Bo	Low/Minimum	BoInvLow=	decimal number		
1/Bo	Central/Most likely	BoInvCentral=			1.29
1/Bo	High/Maximum	BoInvHigh=			
GOR, free Gas	Low/Minimum	GORGasLow=	Sm3/Sm3		
GOR, free Gas	Central/Most likely	GORGasCentral=			
GOR, free Gas	High/Maximum	GORGasHigh=			
GOR, Oil	Low/Minimum	GOROilLow=	Sm3/Sm3		
GOR, Oil	Central/Most likely	GOROilCentral=			82
GOR, Oil	High/Maximum	GOROilHigh=			
Evaluation - discovery					
Discovery?		Discovery=	Yes/No		YES
Surprise discovery ?		SurpriseDiscovery=	Yes/No		NO
Resource class	NPD input	ResourceClass=	NPD codes		
Evaluation - dry well					
If Dry, Oil shows?		ShowsOil=	Yes/No		
If Dry, Gas shows?		ShowsGas=	Yes/No		
CHARGE	Charge	Charge=	OK / Fail / Not relevant		
	Presence of source	ChargePresence=			
	Maturity of source	ChargeMaturity=			
	Migration of HC	ChargeMigration=			
TRAP	Trap	Trap=	OK / Fail / Not relevant		
	Presence of closure	TrapClosure=			
	Presence of top seal	TrapTopSeal=			
	Presence of lateral seal	TrapLateralSeal=			
RESERVOIR	Reservoir	Reservoir=	OK / Fail / Not relevant		
	Presence of reservoir	ReservoirPresence=			
	Quality of reservoir	ReservoirQuality=			
COMMENT	Dry well comments	DryWellComments=			
:::END:::					