Marathon Petroleum Company (Norway)

FINAL GEOLOGICAL REPORT

25/4-8
Gekko

Marathon Petroleum Company (Norway)

August, 2003

Marathon Petroleum Company (Norway),
Bjergstedveien 1,
N-4007 Stavanger,
Postboks 480 Sentrum,
N-4002 Stavanger

Tel: +47 51 50 63 00

Prepared By: **Philip S. Leighton**
Operations Geologist
22 / August / 2003
Date

Approved By: **Jeffrey A. Brehm**
Lead Project Geologist
27 / August / 2003
Date

Approved By: **John Sullivan**
Project Manager
31 / August / 2003
Date

Marathon Petroleum Company (Norway)
Final Geological Report

Table of Contents

Figures and Tables

1. Summary

General Well Data

Well Name:	25/4-8 Gekko
Licence:	PL203
Partner Group:	65% Marathon Petroleum Company (Norway) 20% Norsk Conoco 15% DNO
Location:	West of Heimdal, Norwegian CS
Surface Location:	
Latitude:	59º 30' 52.3698" N
Longitude:	002º 03' 47.1091" E
UTM mE:	446975.89
UTM mN:	6597876.24
Source:	Thales GeoSolutions, Final Position Fix – Differential GPS
Bottom Hole Location:	
Latitude:	59º 30' 52.6768" N
Longitude:	002º 03' 47.6775" E
UTM mE:	446984.96
UTM mN:	6597885.61
Source:	Halliburton Sperry-Sun MWD surveys
UTM Coordinates:	Datum = ED50, Projection = Zone 31N, CM = 3° E
Water Depth:	122.4m
RT Elevation:	23.0m
Total Depth	Driller: 2286m MD -2262.9m TVDSS Logger: 2285m MD -2261.9m TVDSS
Formation at TD:	Paleocene, Heimdal Sandstone.
On location:	07:00, 3rd June 2003
Spud:	19:48, 3rd June 2003
TD:	08:40, 15th June 2003
Operations Completed:	04:00, 21st June 2003
Moved off location:	13:30, 22nd June 2003
Status:	Plugged and Abandoned Gas and Oil Shows

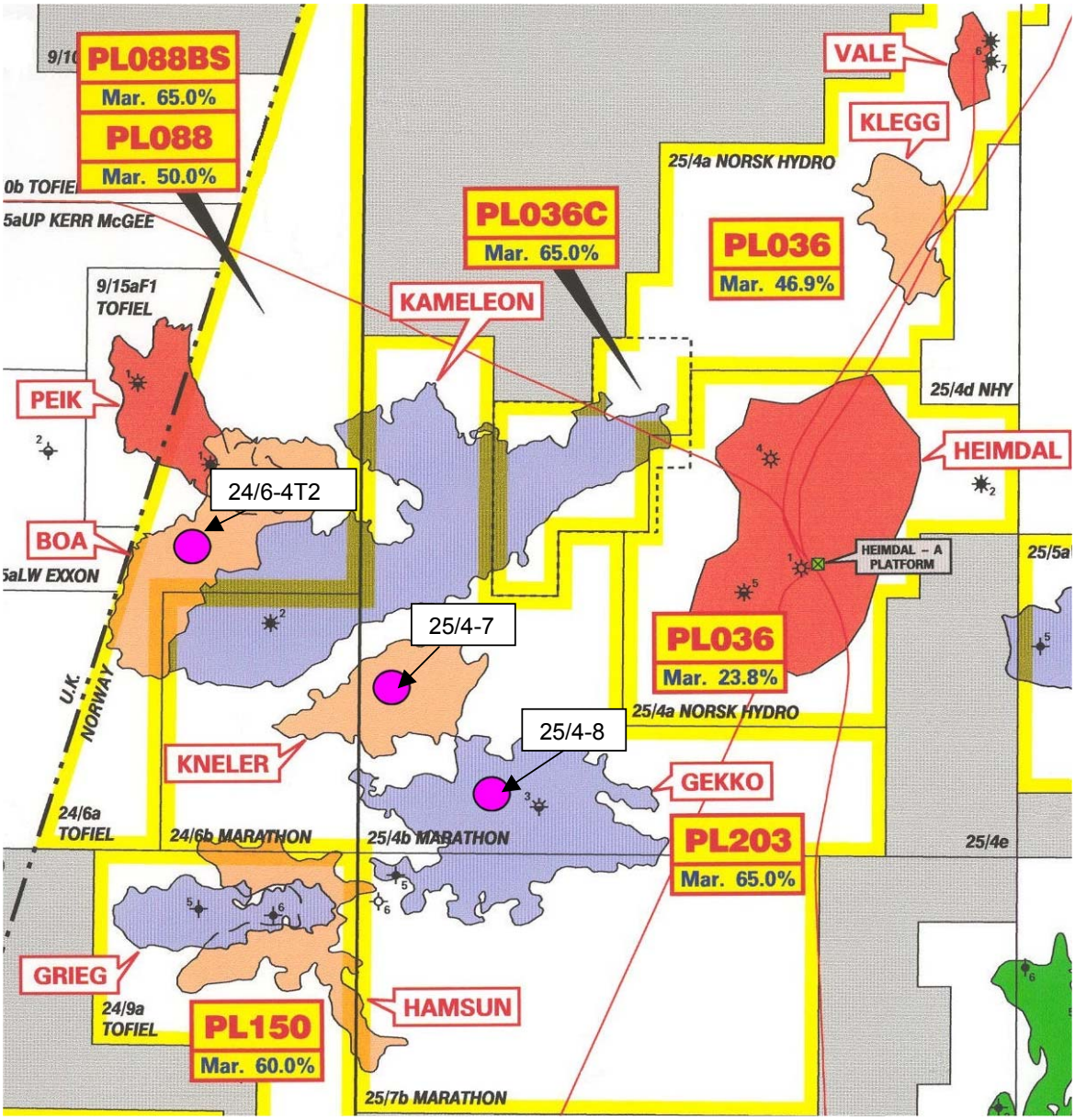
Drilling Data

Drilling Contractor:	Odfjell Drilling
Rig:	Deepsea Bergen
AFE /SAP WBS Number:	DE.02.07912.CAP.DRL

Well Objective

Well 25/4-8 was the second exploratory test of a large, irregular 4-way closure known as the Gekko structure, discovered by well 25/4-3 in 1974. 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. The well was designed to test a mapped culmination 1.7 km to the WNW of the discovery well. While well 25/4-3 found 8m of hydrocarbons in a structurally low position, well 25/4-8 was expected to encounter a hydrocarbon column of 45m with an anticipated oil/water contact at -2107m (as observed in the 25/4-3 well).

Figure 1 – Well Location



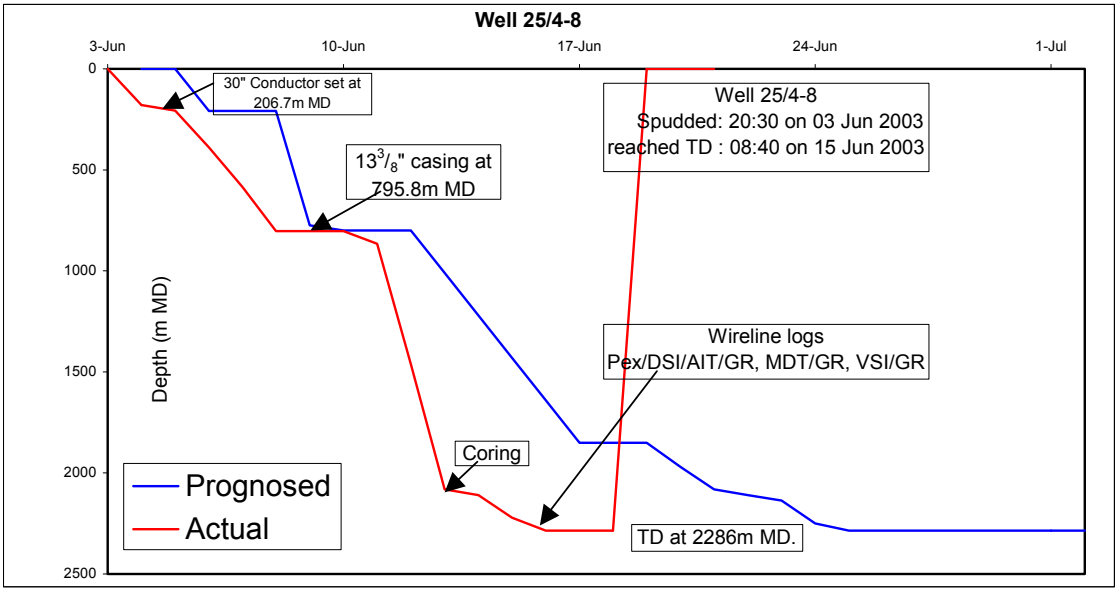
2. Drilling and Engineering Summary

Well 25/4-8 Gekko took a total of 19.0 days to drill, evaluate, plug and abandon. The well spudded at 19:48 hrs on 3rd June 2003 and reached TD of 2286m MD at 08:40 hrs on the 16th June 2003. The well was logged and a total of 4 cement plugs and one bridge plug were set before the well was abandoned with gas and oil shows. 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 – 25/4-8 Gekko Chronological Drilling Data

Date	Days Since Spud	06:00 Depth (m)	Daily Progress (m)	Operation
3 Jun				Tow rig from Boa location, run anchors.
4 Jun	0.4	179	33.6	Run anchors, ballast rig, spud well at 19:48 3 Jun, drill 36" hole to 179m.
5 Jun	1.4	208	29	Drill 36" hole to 208m, wiper trip hole, RIH 30"x20" conductor, abort cement job.
6 Jun	2.4	389	181	Cement 30", P/U and RIH 17½" BHA and drill to 389m, BHA stuck, free, POOH.
7 Jun	3.4	586	197	RIH, drill 17½" hole to 586m, POOH to check BHA and top drive after jarring.
8 Jun	4.4	803	217	RIH, drill 17½" hole to 803m, POOH, condition KCl mud, RIH.
9 Jun	5.4	803	-	Circulate KCl mud, POOH, RIH 13 3/8" casing, cement at 795.8m.
10 Jun	6.4	803	-	Complete cement job, L/D 17½" equipment, run riser.
11 Jun	7.4	865	62	Run riser, test BOPE, RIH 12¼" BHA, drill cement, LOT to 1.41sg, drill to 865m
12 Jun	8.4	1462	597	Drill 12¼" hole to 1462m
13 Jun	9.4	2082	620	Drill 12¼" hole to 2082m (core point), CBU, POOH
14 Jun	10.4	2109	27	POOH, RIH core BHA, cut core to 2109m, POOH, recover core, RIH.
15 Jun	11.4	2221	112	RIH, cut core to 2136m, POOH, recover core, RIH 8½" BHA, ream/drill to 2221m
16 Jun	12.4	2286	65	Drill 8½" hole to 2286m TD, CBU, POOH, log with Pex/DSI/HNGS/AIT, RIH MDT
17 Jun	13.4	2286	-	Take MDT pretest points (37 pressures), 2 fluid samples, POOH, RIH VSI/GR
18 Jun	14.4	2286	-	Complete VSI (55 levels), POOH, RIH 3½" cement stinger, set plugs #1 and #2.
19 Jun	15.4	398	-	Set plug #3, test top plug, L/D excess equipment. RIH EZSV
20 Jun	16.4	-	-	Set EZSV at 398m, set plug #4 above EZSV, pull diverter and riser,
21 Jun	17.4	-	-	Cut 20"/30" casing, POOH RGB, Commence offloading AGIP equipment.
22 Jun	18.4	-	-	Complete offloading AGIP equipment, deballast rig, commence pulling anchors.
Deballasted rig at 02:30 on 22nd June 2003, pulled anchors. Rig officially handed over to Agip at 13:30 on 22nd June 2003 (official handover time adjusted to account for time spent offloading Agip spud material)				

Figure 2 – 25/4-8 Gekko Well Operations Progress Plot



Drilling Operations by Hole Section

36" Hole Section

Well 25/4-8 Gekko was spudded from seabed at 19:48 hrs on 3rd June 2003 and was drilled to 207.7m with varying parameters. The drillstring stalled frequently and hole fill, including boulders, was noted on short trips to clean the hole. Cuttings were returned to seabed. The 30"/20" casing was run and cemented at 206.7m at the second attempt after problems with cement delivery on the first attempt.

17½" Hole Section

The 17½" hole was drilled to section TD in two bit runs with varying parameters, cuttings returned to seabed and the following incidents noted. At 378m and 389m MD the drill string stalled and the hole showed signs of packing-off while drilling. On both occasions the pipe was freed and a trip was made to condition the hole/mud and to inspect the BHA and surface equipment. This problem was repeated at 581m and 586m MD and a further trip was made to clean the hole and change BHA. Drilling recommenced from 586m to 666m where the drill string became stuck but was worked/jarred free and the section then drilled to 803m without further incident. The hole was displaced to 1.17sg KCl mud, a wiper trip made and the hole re-displaced to 1.17sg KCL mud. A $13^3/_8$" casing was run and cemented at 795.8m MD without incident and BOP equipment was successfully installed and tested.

12¼" Hole Section

The well was displaced to 1.27sg oil based mud and the casing and equipment drilled out with a 12¼" drilling assembly with a short, 5m, rathole made to 808m MD. A leak-off test was successfully completed that gave 1.45sg EMW. The well was then drilled in 12¼" hole to 2076m MD without incident. At 2076m drilling was stopped to circulate samples for geology evaluation following which a further 6m was drilled to 2082m MD, designated as coring point.

8½" Hole Section

This section was drilled to TD at 2286m in two coring runs and one bit run without significant incident. A total of 54m of core was cut in the Lista and Heimdal formations with recovery of 51.7m (95.7%) and the core head, a Security DBS FC274Li, was graded 8-8-HC-A-D-3-PN-TD with 2 blades missing. After washing and reaming the cored section, the well was drilled to TD at 2286m in one run with an ATX535HA. Wireline logging proceeded without incident

(refer to Appendix E). Upon completion of logging, the well was plugged and abandoned with four cement plugs and an EZSV/cement plug set at 398m. BOP equipment was recovered and the conductor cut at 150.4m, 5m below the seabed. The rig deballasted and moved off location, commencing at 21:00 on 21st June 2003.

Table 2 – Hole Size and Casing:

Hole Size	Depth (m)	Casing Size	Casing Grade, Weight, Thread Type	Shoe depth (m)
36"	207.7	30"/20"	X56, 309.7lb/ft	206.7
17½"	803.0	$13^3/_8$"	L80, 72lb/ft	795.8
12¼"	2082 [1]			
8½"	2286			

[1] The 12¼" hole was drilled to 2082 where coring with an 8½" corehead commenced. The well was drilled to TD in 8½".

Deviation Surveys:

Well 25/4-8 Gekko 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 25/4-8 Gekko and based on the definitive survey data. The tops are correct as of 20th August 2003.

Table 3 – Formation Tops.

AGE / GROUP FORMATION	DEPTH (m MD)	DEPTH (m TVDSS)	AVT (m)	UTM (mE)	UTM (mN)
Undifferentiated Miocene Nordland Group					
Utsira	385.0	-362.0	391.9	446975.9	6597877.6
Base Utsira	777.0	-753.9		446975.2	6597878.2
Undifferentiated Eocene Hordaland Group					
Grid Sands	1219.0	-1196.0	86.3	446978.2	6597881.5
Base Grid Sands	1305.3	-1282.3	-	446978.5	6597882.0
Rogaland Group					
Balder	1922.3	-1899.2	88.9	446982.2	6597883.5
Balder Tuff	1966.7	-1943.6	44.5	446982.5	6597883.5
Sele	2011.2	-1988.1	49.3	446982.8	6597884.0
Upper Paleocene	2052.0	-2028.9		446983.0	6597884.4
Lista	2060.5	-2037.4	53.0	446983.1	6597884.5
Intra-Lista Sand	2091.6	-2068.5	6.9	446983.3	6597884.5
Base Intra-Lista Sand	2098.5	-2075.4	-	446983.4	6597884.5
Heimdal Sandstone Z1	2113.4	-2090.4	172.5+ 101.0	446983.5	6597884.5
Z2	2214.4	-2191.4	34.8	446984.3	6597884.5
Z3	2249.3	-2226.2	36.7+	446984.6	6597885.6
T.D. (Driller) (Logger, did not tag TD)	2286.0 2285.0	-2262.9 -2261.9		446985.0 446985.0	6597885.6 6597885.6

- SLM confirmation of drillers depth made before wireline logging.
- Formation tops based on correlation with offset wells, principally 25/4-3, 25/4-7 and 24/6-2,
- TVDSS values calculated using the Minimum Curvature method.
- Formation picks for Nordland Group Utsira formation based on GR response (behind casing) only, no cuttings were collected for confirmation.

Lithostratigraphy

The lithology encountered in 25/4-8 Gekko has been defined both biostratigraphically and chronostratigraphically in offset wells (24/6b-2, 24/6a-1, 25/4-3, 25/7b-5, 25/4-7 and 24/6-4T2). Drilled cuttings samples were collected in 25/4-8 to determine the correspondence of the exploration well to the regional lithologies.

Well 25/4-8 spudded in seabed sand and clays corresponding to Quaternary deposits. The well was drilled with seawater and returns to seabed down to 803m MD (below the Utsira formation) so no ditch cuttings could be collected. The formations in this upper interval are inferred from a wireline 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 803m MD to 2052m MD (~780m to ~2029m TVDSS) comprises Eocene age sediments. The uppermost ~300m down to 1100m MD (~1075m TVDSS) is predominantly weakly consolidated siltstone with limestone stringers and minor interbeds of sandstone. The siltstone is dark grey to brownish grey and greenish grey, firm, amorphous to blocky, sandy to locally very sandy grading to silty Sandstone in part, micaceous, variably glauconitic and non- to slightly calcareous. Interbedded quartzose sandstone was dark greyish brown, firm to locally friable and composed of clear to translucent quartz. The quartz was silt to very fine grained, subangular, moderately to well sorted and an abundant argillaceous matrix was present. Cementation was silicic and slightly calcareous, micas and glauconite were variably present as common accessories and visible porosity was poor to locally fair. No shows were noted from the sandstones. Limestone stringers were composed of mudstones that were pale to dark yellowish brown, very hard, cryptocrystalline and had no visible porosity.

Below 1100m MD, the siltstone passes down into claystone with rare limestone stringers. This claystone is dark yellowish brown becoming light olive grey with depth, moderately hard, blocky, locally silty towards the basal contact with the underlying Grid sandstone, micromicaceous, glauconitic and moderately calcareous. Limestone stringers were pale to dark yellowish brown mudstones that were very hard, cryptocrystalline and had no visible porosity. The Late Eocene Grid formation quartzose/aggregate sandstones were typically medium to olive grey, loose to locally firm with clear to translucent quartz. The quartz was very fine to medium, predominantly fine to medium grained, subangular to subrounded, well sorted and silicic and calcareous cemented. An argillaceous matrix was rarely present and pyrite and carbonaceous material variably present as accessories. Visible porosity was nil to locally poor to fair and no shows were noted. Towards the top and base of the Grid formation the sandstone were more extensively calcite cemented becoming locally arenaceous Limestone with no visible porosity and no shows. Interbedded claystones were dark grey to olive black, firm, subblocky to platy, micropyritic and micromicaceous, carbonaceous and non- to slightly calcareous. Limestone as stringers was typically mudstone, varicoloured, firm, cryptocrystalline, argillaceous and sandy with no visible porosity and no shows. Rare intercalations of dolomite were noted towards the base of the formation and were dark yellowish brown, firm, cryptocrystalline and argillaceous with no visible porosity and no shows.

Below the Grid formation, the sequence down to the top of the Balder formation is composed of two principal types of claystone that are intimately intercalated. The claystone was olive black to dark grey alternating dark greenish grey to dark grey, firm, subblocky to subplaty, micromicaceous, microcarbonaceous and non to slightly calcareous becoming moderately calcareous towards the top of the underlying Balder formation. Limestone stringers were common throughout the interval and were mudstone, light grey to dusky pale yellowish brown, firm, microcrystalline to micritic, argillaceous, locally dolomitic and with no visible porosity. No visible porosity or hydrocarbon shows was noted from these limestone stringers.

The top of the Balder (1922.3m MD / –1899.2m TVDSS) was noted by a subtle colour change to a more olive black to olive grey in the claystone that also became increasingly calcareous. At 1960 MD (~–1937m TVDSS) the claystone became tuffaceous, corresponding to the

Balder Tuff down to the top of the underlying Sele at ~2110m MD (~-1988m TVDSS). This tuffaceous claystone was medium grey to dark grey and bluish grey, mottled black and white, firm, subblocky, rarely silty and non- to slightly calcareous but locally became very calcareous grading to argillaceous tuffaceous 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 claystone of the Lower Eocene/Upper Paleocene Sele Formation was predominantly olive black, firm, subblocky, silty in part, rarely micromicaceous, microcarbonaceous and non- to very slightly calcareous. Limestone stringers were typically mudstone, light olive grey, firm, cryptocrystalline, argillaceous and with no visible porosity. The boundary between the Lower Eocene and the Upper Paleocene is considered to be at 2052.0m MD (–2028.9m TVDSS).

Upper Paleocene Lista Formation claystone (2060.5m to 2113.4m MD / –2037.4m to –2090.4m TVDSS) was mid to dark greenish grey becoming greyish black, firm to moderately hard, subblocky, rarely glauconitic and predominantly non calcareous. Whole core cut across the base of the Lista formation (2082.0m to 2113.4m MD / -2058.9m to –2090.4m TVDSS) shows the presence of planar and ripple laminated sandstones which exhibit soft sediment deformation features. These sands have generally low, locally moderate, visible porosity and patchy weak to moderate light brown hydrocarbon stain with a bright yellowish white direct fluorescence. There was no evidence (ditch cuttings, core, wireline logs) to indicate the presence of sands of the Hermod formation at this location.

The top of the Upper Paleocene Heimdal Formation sandstone was placed at 2113.3m (from core and log data) and the well reached TD at 2286m MD in the Heimdal, Z3. A total of 54m of core was cut (refer to Table 9 and Appendix G for details) within both the Lista and Heimdal formations. The Heimdal Formation at this location consists of a sequence of low density turbidites with minor hemipelagic claystones that pass downwards into more massive sandstones below the cored interval. In ditch cuttings, the sandstone was seen predominantly as disaggregated loose quartz sand, light greyish brown to light olive grey, clear to translucent, variably fine to very coarse grained locally cobble, subangular to subrounded and moderately, locally well, sorted. The sandstone had a locally developed argillaceous matrix, traces of micas and carbonaceous material, was rarely calcite cemented and had generally fair to moderate visible porosity. Hydrocarbon shows in the gas bearing sandstone intervals were typically a dull yellowish white direct fluorescence with a dull bluish white cut, no cut colour and a very light bluish white residue. Hydrocarbon shows in the oil bearing sandstone intervals were a moderate petroliferous odour, light brown oil stain on cuttings/core, bright yellow direct fluorescence with an instant bright bluish white cut and a bright bluish white 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 25/4-8 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											
2096	7.46	1.9	5.56	P	74450	1767	1494	612	300	1057	438
2113	5.62	1.47	4.15	P	45707	1754	1555	727	352	1145	439
2122	5.24	1.24	4.00	P	19840	779	905	427	233	819	320
2129	2.05	1.00	1.05	P	10953	526	641	367	252	751	342

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

The gas data above is taken from a separate gas system installed by Datalog Technologies Ltd. and run as part of a trial of a continuous chromatographic analysis system. The data is considered more representative of entrained gas than that measured by the standard type of gas trap (refer to Appendix D for details).

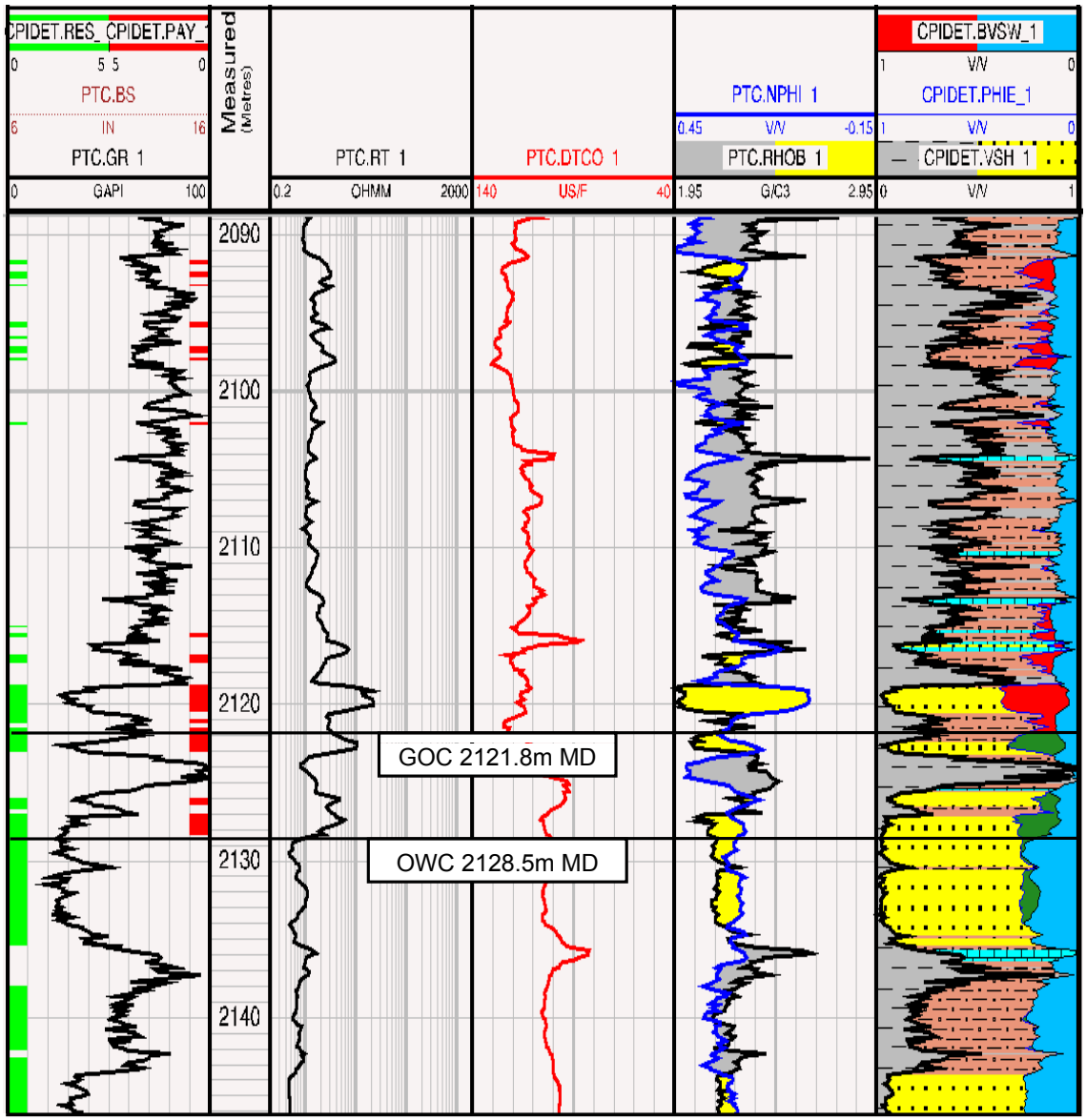
Table 5 – Shows Table

Depth (m) from - to	Formation / Lithology	Show description
2082.0-2122.0	Sandstone	No HC odor, dull yel-wh dir fluo, dull bl-wh cut & res. Ggas show.
2122.0-2129.0	Sandstone	Mod HC odor, lt brn O stn, bri yel dir fluo, inst bri bl-wh cut & res. Oil show
2129.0 – 2134.0	Sandstone	Fnt-mod HC odor, nil to lt brn O stn, dull-bri yel dir fluo, inst dull-pale bl-wh – pnk cut, dull-pl grn fluo res. OWC-Transition zone shows.

Preliminary Petrophysical Interpretation

Preliminary petrophysical evaluation of wireline logs acquired demonstrates that sands within the Lista Formation are gas bearing and that the Heimdal Formation is gas and oil bearing at this location with a gas-oil contact (GOC) at 2121.8m MD / –2098.8m TVDSS and an oil-water contact (OWC) at 2128.5m MD / –2105.5m TVDSS. The OWC was 1.5m shallow compared to that described for the exploration well 25/4-3 and is consistent with shows described from core and cuttings within the Heimdal. Figure 3 below shows a preliminary interpretation with a finalised interpretation available through the West of Heimdal Plan of Development and Operations (PDO).

Figure 3 – 25/4-8 Gekko Preliminary Petrophysical Interpretation



5. Formation Evaluation

Formation evaluation was provided on the 25/4-8 Gekko 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 (refer to 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. 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.

Support of the geology operation was adequate to good.

Wireline Logging

Schlumberger provided the wireline logging service on 25/4-8 Gekko. Three suites of logs were run (Table 6) with formation sampling at three separate depths within the reservoir (Table 7). A summary of logging efficiency is provided in Table 8 and a more detailed breakdown of wireline operations is presented in Appendix E.

Table 6 – Summary of Wireline Logging Runs

Log Run	Logger's TD (m)	Logged Interval (m)	Max. BHT(°C)	Therm. Depth(m)
Pex/AIT/DSI/HNGS	2285	2284.0 – 145.4		2268
MDT/GR	2285	2182.0 – 2092.0	N/a	
VSI/GR	2285	2280 – 631.9	N/a	

Logging operations commenced on the 15th June 2003, lasted 46.67 hours and were completed on 17th June 2003. The MDT was configured for pretest pressures, oil sampling and with the GR module on the bottom for reservoir correlation. Thirty pre-test pressures were requested and a total of 27 formation pressures were obtained from 2092.0m to 2182.0m MD following Marathon standard pre-test pressure procedures. The MDT sampling program was also completed satisfactorily with two gas and one oil sample taken as detailed in Table 7 below.

Table 7 – MDT Sampling

Depth (m MD)	Sample	SPMC	MPSR	Large Volume Chambers
2097.0	Gas	2	3	
2120.0	Gas	1	3	1 x 6 gal
2127.2	Oil	1	2	1 x 2¾ gal

Table 8 – Logging Efficiency Analysis

Log Run	Log Speed (ft/hr)	Logged Interval (m)	Total Time Hrs:mins	Lost Time Hrs:mins	Efficiency %
Pex/AIT/DSI/HNGS	1800	2284.0 – 145.4	8:50	-	100.0
MDT/GR	N/a	2182.0 – 2092.0	23:50	0:25	98.2
VSI/GR	N/a	2280 – 631.9	11:00	-	100.0

Performance Evaluation

Schlumberger carried out wireline operations in a safe manner, without incident and with the following problem noted. The VSI log was made with a vertical interval of 7.5m instead of 10m. This was the result of problems in tool string configuration and the survey was made with this spacing to ensure adequate data quality. Logging took approximately 3 hours longer than should have been required for a properly configure VSI string.

Coring Operations

Halliburton provided the coring services on 25/4-8 Gekko 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	2082	2109	27	25.1	93.0	-	DBS FC274Li / 1.55
2	2109	2136	27	26.6	98.5	-	DBS FC274Li / 1.55

Performance Evaluation

Coring operations were carried out in a safe and efficient manner and core recovery was excellent (51.7m recovered from 54m cut, 95.7%) in thin interbedded sandstones of the lowermost Lista and 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. Onshore 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 30' 52.3698" N, 002º 03' 47.1091" E
Location Grid Y/X: 6597876.24m N, 446975.89m E
Grid Convergence Angle: -0.807°
Final Coordination data from: Thales GeoSolutions, Final Position Fix – Differential GPS
Date of Survey: 04 June 2003
Survey / DLS Computation Method: Minimum Curvature
Vertical Section Azimuth: 44.061º (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: -122.4m relative to MSL
Magnetic Declination: -2.322°
Declination Date: 26 June 2003
Magnetic Declination Model: BGGM 2003
North Reference: Grid North
Total Corr Mag North -> Grid North: -3.129°
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	-	6597876.24	446975.89	59º30'52.37"	002º03'47.11"
145.0	0.00	0.00	145.00	0.0	0.00	0.00	0.00	6597876.24	446975.89	59º30'52.37"	002º03'47.11"
219.3	0.75	2.23	219.30	0.4	0.49	0.02	0.31	6597876.73	446975.91	59º30'52.39	002º03'47.11"
248.9	0.20	347.24	248.90	0.5	0.73	0.02	0.58	6597876.97	446975.91	59º30'52.39"	002º03'47.11"
336.4	0.37	8.54	336.39	0.8	1.16	0.02	0.07	6597877.40	446975.91	59º30'52.41	002º03'47.11"
365.1	0.43	11.69	365.09	1.0	1.36	0.06	0.07	6597877.60	446975.95	59º30'52.41"	002º03'47.11"
393.0	0.28	22.89	392.99	1.2	1.52	0.11	0.18	6597877.76	446976.00	59º30'52.42"	002º03'47.11"
422.0	0.09	21.51	421.99	1.3	1.61	0.14	0.20	6597877.85	446976.03	59º30'52.42"	002º03'47.12"
451.1	0.06	290.51	451.09	1.3	1.63	0.14	0.11	6597877.87	446976.03	59º30'52.42"	002º03'47.12"
480.3	0.09	70.73	480.29	1.3	1.65	0.14	0.15	6597877.89	446976.03	59º30'52.42"	002º03'47.12"
509.6	0.12	287.48	509.59	1.3	1.66	0.14	0.21	6597877.90	446976.03	59º30'52.42"	002º03'47.12"
538.6	0.14	246.00	538.59	1.2	1.66	0.08	0.10	6597877.90	446975.97	59º30'52.42"	002º03'47.11"
565.5	0.18	230.06	565.49	1.2	1.62	0.01	0.07	6597877.86	446975.90	59º30'52.42"	002º03'47.11"
593.7	0.22	272.33	593.69	1.1	1.59	-0.08	0.16	6597877.83	446975.81	59º30'52.42"	002º03'47.10"
622.1	0.44	272.52	622.09	1.0	1.60	-0.24	0.24	6597877.84	446975.65	59º30'52.42"	002º03'47.09"
651.0	0.35	277.51	650.99	0.9	1.61	-0.44	0.10	6597877.85	446975.45	59º30'52.42"	002º03'47.08"
681.1	0.28	300.60	681.09	0.8	1.66	-0.59	0.15	6597877.90	446975.30	59º30'52.42"	002º03'47.07"
710.0	0.31	330.80	709.99	0.8	1.77	-0.69	0.16	6597878.01	446975.20	59º30'52.43"	002º03'47.06"
739.4	0.18	348.86	739.39	0.8	1.88	-0.74	0.16	6597878.12	446975.15	59º30'52.43"	002º03'47.06"

768.4	0.25	16.94	768.39	0.9	1.99	-0.73	0.13	6597878.23	446975.16	59º30’52.43”	002º03’47.06”
806.9	0.46	34.42	806.89	1.1	2.20	-0.62	0.19	6597878.44	446975.27	59º30’52.44”	002º03’47.07”
861.1	0.40	40.36	861.09	1.6	2.52	-0.37	0.04	6597878.76	446975.52	59º30’52.45”	002º03’47.08”
892.2	0.45	43.85	892.19	1.8	2.69	-0.22	0.06	6597878.93	446975.67	59º30’52.46”	002º03’47.09”
922.9	0.50	47.51	922.89	2.0	2.87	-0.03	0.06	6597879.11	446975.86	59º30’52.46”	002º03’47.10”
951.0	0.58	54.83	950.98	2.3	3.03	0.17	0.11	6597879.27	446976.06	59º30’52.47”	002º03’47.12”
980.0	0.62	50.16	979.98	2.6	3.22	0.41	0.07	6597879.46	446976.30	59º30’52.47”	002º03’47.13”
1009.0	0.64	52.18	1008.98	2.9	3.42	0.66	0.03	6597879.66	446976.55	59º30’52.48”	002º03’47.15”
1038.1	0.69	49.19	1038.08	3.3	3.63	0.92	0.06	6597879.87	446976.81	59º30’52.49”	002º03’47.16”
1067.0	0.71	52.15	1066.98	3.6	3.86	1.20	0.04	6597880.10	446977.09	59º30’52.50”	002º03’47.18”
1096.1	0.65	49.92	1096.07	3.9	4.07	1.46	0.07	6597880.31	446977.35	59º30’52.50”	002º03’47.20”
1125.1	0.62	52.72	1125.07	4.3	4.27	1.71	0.05	6597880.51	446977.60	59º30’52.51”	002º03’47.21”
1154.1	0.57	49.04	1154.07	4.6	4.46	1.95	0.07	6597880.70	446977.84	59º30’52.51”	002º03’47.23”
1183.1	0.63	44.95	1183.07	4.9	4.67	2.17	0.08	6597880.91	446978.06	59º30’52.52”	002º03’47.24”
1241.5	0.39	41.72	1241.47	5.4	5.05	2.53	0.13	6597881.29	446978.42	59º30’52.53”	002º03’47.27”
1328.2	0.37	29.88	1328.17	6.0	5.51	2.87	0.03	6597881.75	446978.76	59º30’52.55”	002º03’47.29”
1357.3	0.37	18.38	1357.27	6.1	5.68	2.94	0.08	6597881.92	446978.83	59º30’52.55”	002º03’47.29”
1386.3	0.34	20.45	1386.26	6.3	5.85	3.00	0.03	6597882.09	446978.89	59º30’52.56”	002º03’47.29”
1502.2	0.60	85.52	1502.16	7.1	6.22	3.73	0.14	6597882.46	446979.62	59º30’52.57”	002º03’47.34”
1531.1	0.50	91.72	1531.06	7.3	6.23	4.00	0.12	6597882.47	446979.89	59º30’52.57”	002º03’47.36”
1560.1	0.48	103.10	1560.06	7.4	6.20	4.25	0.10	6597882.44	446980.14	59º30’52.57”	002º03’47.37”
1589.1	0.41	99.37	1589.06	7.5	6.15	4.47	0.08	6597882.39	446980.36	59º30’52.57”	002º03’47.39”
1647.1	0.25	90.32	1647.06	7.7	6.12	4.80	0.09	6597882.36	446980.69	59º30’52.57”	002º03’47.41”
1676.2	0.31	85.26	1676.16	7.8	6.12	4.94	0.07	6597882.36	446980.83	59º30’52.57”	002º03’47.42”
1705.1	0.29	75.17	1705.06	8.0	6.15	5.09	0.06	6597882.39	446980.98	59º30’52.57”	002º03’47.43”
1734.0	0.34	71.09	1733.95	8.1	6.19	5.24	0.06	6597882.43	446981.13	59º30’52.57”	002º03’47.44”
1763.0	0.44	58.41	1762.95	8.3	6.28	5.42	0.14	6597882.52	446981.31	59º30’52.57”	002º03’47.45”
1792.0	0.43	54.52	1791.95	8.5	6.40	5.60	0.03	6597882.64	446981.49	59º30’52.58”	002º03’47.46”
1850.2	0.43	52.06	1850.15	8.9	6.66	5.95	0.01	6597882.90	446981.84	59º30’52.59”	002º03’47.48”
1908.4	0.47	61.29	1908.35	9.4	6.91	6.33	0.04	6597883.15	446982.22	59º30’52.60”	002º03’47.51”
1937.5	0.45	54.89	1937.45	9.6	7.04	6.53	0.06	6597883.28	446982.42	59º30’52.60”	002º03’47.52”
2024.5	0.46	53.91	2024.45	10.3	7.44	7.09	0.00	6597883.68	446982.98	59º30’52.61”	002º03’47.55”
2070.9	0.62	45.01	2070.84	10.7	7.72	7.42	0.12	6597883.96	446983.31	59º30’52.62”	002º03’47.57”
2082.0	0.62	45.01	2081.95	10.8	7.81	7.51	0.0	6597883.96	446983.31	59º30’52.63”	002º03’47.58”
2136.0	0.62	45.01	2135.94	11.4	8.22	7.92	0.0	6597883.96	446983.31	59º30’52.64”	002º03’47.61”
2286.0	0.62	45.01	2285.93	13.0	9.37	9.07	0.00	6597885.61	446984.96	59º30’52.68”	002º03’47.68”

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 810 to 2000m	
	3 meter intervals from 2000 to 2136m	
	5 meter intervals from 2136 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 – M/LWD and Directional Details

For complete details of the equipment and service provided please refer to the LWD Service Company Contract. LWD services provided on this well were restricted to GR logging available as part of MWD services. No directional drilling was undertaken as this was designed as a vertical 'finder' well.

LWD Company	Halliburton Sperry-Sun
Personnel	
MWD Engineers	Terje Fjeldheim
Base Manager	S.M. Osnes
Logs produced	1:200 & 1:500 GR (MD) 205m – 803m (superceded by wireline GR)

Appendix D – Trial of Membrane type Chromatographic Mud Gas Analysis.

Datalog Technology Ltd. was contracted, under a field trial basis, to offer Marathon Petroleum Company (Norway) use of their Total Gas GasWizard (commercially available) and a trial of the Chromatograph version of this membrane based quantitative gas extraction technology. The objective of the field trial was to establish if the system was capable of providing continuous drilled gas chromatographic analysis on the rig 'Deepsea Bergen', given the limitations imposed on traditional gas trap type systems by the flowline geometry and design.

The system was installed on rig 'Deepsea Bergen' and was operation for the duration of the 12¼" and 8½" hole sections. Full details of the data obtained by this trial are available in a separate report provided by the contractor. Details of the comparison between standard mudlogging systems and this membrane based system form part of a review of mudlogging services carried out by MPC(N) and are available separately.

The Datalog Chromat Wizard system proved that it was possible to obtain quantitative gas data on a continuous basis without the limitations imposed by a traditional gas trap system. The data produced was reliable and gave good correlation with wireline log, core and sample observed shows.

Appendix E – 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
			PEX-DSI-HNGS-AIT, run # 1A
15/6/03	15:30		Held pre-job safety meeting.
	16:30		Start rig-up
	19:45		RIH, start down log at 796m (csg shoe) w/ ~ 6000 ft/hr. Passed into 8½" hole without any problems. Tagged bottom at 2285m.
	20:20		Start log up w/ 1800 ft/hr. MSM screen #1 locked. Upper dipole not reading correctly. At 1980m stopped logging due to problem with upper dipole. Treat logged interval as repeat section. Run back to bottom.
	20:40		Start main log up. Both dipoles read OK. MSM screen #1 OK.
	21:50		Main log completed at 1700m.
	22:10		Close caliper and drop down to 1750m. Open up caliper and start logging up for DSI-GR.
	23:00		At 13 3/8" casing shoe. Up log –1.2m shallow compared with down log.
	23:40		At surface.
16/6/03	01:20		Complete rig down PEX-DSI-HNGS-AIT
			Total operation time: 8 hrs 50 mins
			Lost time: nil
			Run 2: MDT-GR, (Combined oil and gas), run # 1A
16/06/03	01:20		Rig up
	04:00		RIH
	05:30		Start depth correlation
	05:45		Start first pretest, first stop depth 2092m
	10:21		Finished pretests, 29 levels pressure tested
	10:30		Started depth correlation, adjusted / added 0.7m, and RIH for first oil sample @ 2127.2m
	10:50		Checked pretest @ 2127.2m. OK.
	11:00		Started cleanup.
	13:10		Started sampling of 2 3/4gallon chamber, MRSC # 115, @2127.2m
	13:22		Finished filling / started flushing
	13:26		Flushing completed / started filling 3 liter MPSR bottle # 803.
	13:39		Bottle # 803 could not open, multisampler did not respond, swapped to MPSR bottle # 786, and started filling.
	13:41		Filling of # 786 completed, start cleanup.
	13:45		Cleanup completed, started filling MPSR bottle # 800
	13:46		Filling completed, started flushing.
	13:51		Flushing completed, started filling SPMC # 43
	13:53		Filling completed

	14:00		Checked pretest after for 2127.2m, OK
	14:10		Rebooted string to try MS work, OK after 2 minutes
	14:14		Started depth check, added 0.2m.
	14:31		At 2120m, depth for first gas sample. Did check of pretest. OK
	14:40		Started cleanup
	14:50		Stopped intermittently due to only one stroke pump working, worked only one way.
	15:00	10 min	Continued with only one way stroke pump, 750 RPM
	15:40		Finished cleanup, started filling 6 gallon chamber # 62
	16:55		Finished filling, started flushing
	17:00		Finished flushing, started filling 2 ¾ gallon chamber # 133
	17:38		Finished filling, started flushing
	17:44		Finished flushing, started filling MPSR bottle # 644
	17:48		Finished filling, started flushing
	17:53		Finished flushing, started filling SPMC # 121
	17:57		Finished filling, started flushing
	18:02		Finished flushing, started filling SPMC # 101
	18:05		Finished filling, started flushing
	18:10		Finished flushing, started filling SPMC # 111
	18:12		Finished filling, started check of pretest after sampling, OK.
	18:20		Started depth check at 2170m, OK
	18:35	15 min	At 2097, next depth for gas sample. Trouble shoot problem with stroke pump. No go.
	20:00		Started pretest check at2097m, aborted due to low mobility. Ran correlation run. Added + 0.3m to match main log. Back at 2097m set probe. Good pre-test 326.4 Cp/md.
	20:10		Start pump for clean-up. No go on pump. Start trouble shooting
	21:00		Pump OK on one stroke. Start pump for clean-up. Took security sample (MPSR450cc).
	21:30		Continue pump for clean-up.
	22:00		Start sampling with multi-sampler. Filled ,MPSR 450cc # 803, MPSR 450cc # 856, SPMC 250cc # 100, SPMC 250cc # 137
	23:30		Retracted probe. POOH. Slick hole on way out.
17/06/03	00:30		Complete rig down of MDT-GR
			Total operation time: 23 hrs 50 mins
			Lost time: 25mins
			Run VSI-GR, run # 1A
17/6/03	00:30		Start rigging up
	02:20		RIH to 708m
	02:38		Synchronize gun, perform checkshot, close cal
	03:15		RIH to TD
	03:25		Did depth correlations.
	03:30		Start survey at 2280m, logged with 7.5m intervals
	09:30		VSI completed at 631.9m, start POOH
	10:00		OOH, start R/D
	11:30		Finished R/D. Rig floor cleared to drilling contractor.
			Total operation time: 11 hrs 0 mins
			Lost time: nil
			SUM OPERATIONS TIME: **43.67hrs**
			SUM LOST TIME: **0.42hrs**
			OPERATING TIME – LOST TIME (Logging time): **43.25hrs**
			EFFICIENCY = 1-[LT/(TT-LT)]: **99.02%**

Comments, Problems and Evaluation of Wireline Logging Runs

PEX/DSI/HNGS/AIT, Run 1A
Minor problem with upper dipole on DSI while logging for repeat section. Dipole worked ok on main log.
MDT-GR, (pre-test with combined gas/oil sampling), Run 1B
Minor problem with stroke pump resulted in 24 minutes lost time.
Took 37 pre-test (6 tight, 3 semi-tight, 1 lost seal, 27 good test). Sampled for Oil at 2127.2m, sampled for gas at 2120m and at 2097m. Sample chamber MPSR450cc did not open as expected. All other sample chambers worked OK.
Over all a good and efficient run. The pump on the MDT seams to be a weak point. Experienced similar problems on the Boa well with pump only working on one stroke.

Log Header Information

Company	Marathon Petroleum Company (Norway)
Well	25/4-8
Field	Gekko
Country	Norway
Location	North Sea
State	
Latitude	59° 30' 52.370" N
Longitude	02° 03' 47.107" E
Rig	Deep Sea Bergen
Permanent Datum	MSL
Log Measured From	rig floor
Drilling Measured From	rig floor
Elevation: RT	23
: GL	23
: DF	23
Logging Date	15/06/03 - , 2003
Drillers Depth	2286
Casing 20/30”	206.7m
Casing 13 3/8” (id)	795.8m
Hole Size	12 ¼” , 8 ½” open hole
Max Well Deviation	Vertical hole, max: 0.71º at 1067.0m
Type Fluid in Hole	OBM
Source of Sample	Flow line
Density (ppb)	1.28 sg
Viscosity	75
Fluid Loss (HTHP)	4.4
Oil/Water ratio	70/30
pH	
Barite (%, ppb)	
KCl	
Lost Circulation Material	
Drilling Stopped	08:40 hrs 15/06/03
Circulation Time	1:30 hrs
Time Circulation Stopped	10:30 hrs 15/06/03
RM @ measured temp	N/A
RMF @ measured temp	N/A
RMC @ measured temp	N/A
Witness	A. Knape / S. Bjerkenes
Logging Engineers	B. W. Mitchell / R. B. Twigg
MDT Specialist	S. Allan

Appendix F – 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	2092	2068.9	268.103	267.944		204.721	55.8	Good test
2	2093	2069.9	268.048	267.944		204.692	35.7	Good test
3	2095.5	2072.4	268.307	268.185		204.684	21.9	Good test
4	2097	2073.9	268.414	268.317		204.682	219.4	Good test
5	2098.2	2075.1	268.489	268.398		204.688	119.7	Good test
6	2102	2078.9	268.992	268.895				Dry Test
7	2102.2	2079.1	268.94	268.822		204.771	0.5	Good test
8	2108.5	2085.4	269.841	269.696				Lost Seal
9	2109	2085.9	269.764	269.674				Dry Test
10	2113.5	2090.4	270.389	270.273		201.538	713.2	Good test
11	2115.5	2092.4	270.6	270.512		201.572	581.5	Good test
12	2117	2093.9	270.764	270.682		201.733	1.2	Good test
13	2117.2	2094.1	270.755	270.698		201.597	59.6	Good test
14	2119	2095.9	270.999	270.933		201.628	1845.7	Good test
15	2120	2096.9	271.103	271.058		201.645	5094.2	Good test
16	2122	2098.9	271.398	271.339		201.7	553.9	Good test
17	2123	2099.9	271.503	271.454				Dry Test
18	2122.5	2099.4	271.426	271.379		201.73	588.5	Good test
19	2126	2102.9	271.961	271.893				Dry Test
20	2126.2	2103.1	271.904	271.843		202.073	6.8	Good test
21	2127.2	2104.1	272.025	271.98		202.186	983.8	Good test
22	2128	2104.9	272.114	272.082		202.242	1034.9	Good test
23	2129	2105.9	272.249	272.205		202.337	987.5	Good test
24	2130	2106.9	272.376	272.331		202.464	12.4	Good test
25	2132	2108.9	272.666	272.605		202.636	1223.9	Good test
26	2133	2109.9	272.777	272.733		202.745	1174.2	Good test
27	2146	2122.9	274.712	274.588		204.046	562	Good test
28	2153	2129.9	275.64	275.533		204.761	376.2	Good test
29	2182	2158.9	279.595	279.437		207.691	976.8	Good test
30	2127.2	2104.1	271.871			202.157	2256.9	Before sampling
31	2127.2	2104.1		272.324		202.223	4559.1	After sampling
32	2120	2096.9	270.995			201.666	6329.6	Before Sampling
33	2120	2096.9		270.964		201.685	6248.9	After Sampling
34	2097	2073.9					1	Before Sampling
35	2097.5	2074.4	268.113			204.667	24.6	Before Sampling

Appendix G – Enclosure 1 - Completion Log

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

Section: "Well data"	Comments	Comments	If there is more than one prognosis per prospect, please duplicate the prognosis column. Prognosis	Result
Well Name	Always fill in	NPD approved name	25/4-8	25/4-8
Production Licence Number	NPD input	NPD approved name		
	NPD input	NPD approved name		
Operator			Marathon Petroleum Company (Norway)	
Well type: required/committed as a part of the licence award?		Yes/No	No	
Well classification		Wildcat / appraisal	Wildcat	
License round	NPD input			
	NPD input			
Seismic database (2D/3D)		2D/3D	3D	
Frontier area?	NPD input	Yes/No		
Structural element/Province			NORDSJOEN	
Spud date	NPD input			
Completion date	NPD input			
Water depth		meter		122.4
Stratigraphic age at TD				Upper Paleocene
Paragraph: prospect				
Prospect name	Always fill in	Operators name	Gekko	Gekko
Prospect ID	NPD input	NPD code		
Distance to nearest relevant well		km	1.6	
Nearest well Name		NPD approved name	25/4-3	
Prospect Priority if several in well		number 1,2,…	1	
Prognosis ID (if several)		Operators name	Gekko	
Prognosis priority in prospect	(1/2/3…)	number 1,2,…	1	
Reference(s) to mapping & evaluation		Report name etc.	Delineation Well 25/4-8 Data Package (PL203), drilling program	Final Geological Report 245/4-8
Evaluation year			2002/3	2003
Reference(s) to NPD evaluation	NPD input			
NPD evaluation year	NPD input			
	Date (DD.MM.YY)		01/11/2002	31/08/2003

Data compilation	Department, Institution		Norway Subsurface	Norway Subsurface
	Name		Jeff Brehm	Jeff Brehm
	Date (DD.MM.YY)			
Data Quality control	Department, Institution		Norway Subsurface	Norway Subsurface
	Name		Jeff Brehm	Jeff Brehm
Comments	Variation from standard methodology		No variation from standard methodology	No variation from standard methodology
Geo				
Trap type		Defined numeric code	1.2 Anticlinal traps	1.2 Anticlinal traps
Reservoir stratigraphic level(s)	Chronostratigraphic		Upper Paleocene	Upper Paleocene
Reservoir stratigraphic level(s)	Lithostratigraphic		Heimdal Fm	Heimdal Fm
NPD play	NPD input			
New play	NPD input			
Inferred source rock 1	Chronostratigraphic		UPPER JURASSIC	UPPER JURASSIC
Inferred source rock 1	Lithostratigraphic		HEATHER	DRAUPNE FM
Inferred source rock 2	Chronostratigraphic			
Inferred source rock 2	Lithostratigraphic			
Seal	Chronostratigraphic		Lower Tertiary	Lower Tertiary
Seal	Lithostratigraphic		Undiff'd Hordaland Gp	Undiff'd Hordaland Gp
Probability				
Probability of discovery, technical	Total	Fraction	0.85	
Probability of discovery, technical	Charge		1.00	
Probability of discovery, technical	Trap		0.85	
Probability of discovery, technical	Reservoir		1.00	
Comments	Comments relevant to risking (DHI, AVO analysis, etc.)		AVO analysis	
Resources				
Main hydrocarbon phase		OIL, OIL/GAS, GAS	GAS/OIL	GAS/OIL
Fractiles, resource parameter ranges	Low/Minimum	Fraction		
Fractiles, resource parameter ranges	Preferably Mean (or Most likely or Median)	Mean/ML/Med	Most Likely	Most Likely
Fractiles, resource parameter ranges	High/Maximum	Fraction		
Gas in place (as main phase)	Low/Minimum	10^9Sm3	2.80	
Gas in place (as main phase)	Central/Most likely		6.40	<2.0
Gas in place (as main phase)	High/Maximum		7.10	
Oil as associated phase in place	Low/Minimum	10^6Sm3		
Oil as associated phase in place	Central/Most likely			
Oil as associated phase in place	High/Maximum			
Oil in place (as main phase)	Low/Minimum			

Oil in place (as main phase)	Central/Most likely	10^6Sm3		
Oil in place (as main phase)	High/Maximum			
Gas as associated phase in place	Low/Minimum			
Gas as associated phase in place	Central/Most likely	10^9Sm3		
Gas as associated phase in place	High/Maximum			
Gas recoverable (as main phase)	Low/Minimum		1.40	
Gas recoverable (as main phase)	Central/Most likely	10^9Sm^3	3.80	N/A
Gas recoverable (as main phase)	High/Maximum		4.50	
Oil as associated phase recoverable	Low/Minimum			
Oil as associated phase recoverable	Central/Most likely	10^6Sm3		N/A
Oil as associated phase recoverable	High/Maximum			
Oil recoverable (as main phase)	Low/Minimum			
Oil recoverable (as main phase)	Central/Most likely	10^6Sm3		N/A
Oil recoverable (as main phase)	High/Maximum			
Gas as associated phase recoverable	Low/Minimum			
Gas as associated phase recoverable	Central/Most likely	10^9Sm3		
Gas as associated phase recoverable	High/Maximum			
Part of prospect in Production Licence		Fraction	1.00	1.00
Reservoir parameters				
Pressure, top reservoir		bar	200	201.5
Temperature, top reservoir		degrees C	68	68
Fractiles, reservoir parameter ranges	Low/Minimum	Fraction		
Fractiles, reservoir parameter ranges	Preferably Mean (or Most likely or Median)	Mean/ML/Med		
Fractiles, reservoir parameter ranges	High/Maximum	Fraction		
Depth to top of prospect	Low/Minimum		2052	
Depth to top of prospect	Central/Most likely	meters, MSL	2062	2090.4
Depth to top of prospect	High/Maximum		2072	
Depth to top reservoir in well	Low/Minimum		2052	
Depth to top reservoir in well	Central/Most likely	meters, MSL, TVD	2062	2090.4
Depth to top reservoir in well	High/Maximum		2072	
Gross rock volume	Low/Minimum		0.16	
Gross rock volume	Central/Most likely	10^9m^3	0.31	0.21
Gross rock volume	High/Maximum		0.61	
Hydrocarbon column height in prospect/ segment	Low/Minimum		40	
Hydrocarbon column height in prospect/ segment	Central/Most likely	meters	45	15.1

Hydrocarbon column height in prospect/ segment	High/Maximum		55	
Hydrocarbon column height in well	Low/Minimum	meters	40	
Hydrocarbon column height in well	Central/Most likely		45	15.1
Hydrocarbon column height in well	High/Maximum		50	
Area of prospect/segment	Low/Minimum	Km^2		
Area of prospect/segment	Central/Most likely		25.40	27.40
Area of prospect/segment	High/Maximum			
Reservoir thickness	Low/Minimum	meters vertical at well position		
Reservoir thickness	Central/Most likely			375
Reservoir thickness	High/Maximum			
Net/gross	Low/Minimum	Fraction	0.75	
Net/gross	Central/Most likely		0.80	0.54
Net/gross	High/Maximum		0.85	
Porosity	Low/Minimum	Fraction	0.20	
Porosity	Central/Most likely		0.25	0.25
Porosity	High/Maximum		0.28	
Water saturation	Low/Minimum	Fraction	0.10	
Water saturation	Central/Most likely		0.20	0.43
Water saturation	High/Maximum		0.30	
Bg	Low/Minimum	decimal number		
Bg	Central/Most likely			
Bg	High/Maximum			
1/Bo	Low/Minimum	decimal number		
1/Bo	Central/Most likely			
1/Bo	High/Maximum			
GOR, free Gas	Low/Minimum	Sm3/Sm3		
GOR, free Gas	Central/Most likely			
GOR, free Gas	High/Maximum			
GOR, Oil	Low/Minimum	Sm3/Sm3		
GOR, Oil	Central/Most likely			
GOR, Oil	High/Maximum			
Evaluation - discovery				
Discovery?		Yes/No		YES
Surprise discovery ?		Yes/No		NO
Resource class	NPD input	NPD codes		
Evaluation - dry well				
If Dry, Oil shows?		Yes/No		
If Dry, Gas shows?		Yes/No		
CHARGE	Charge	OK / Fail / Not relevant		
	Presence of source			

	Maturity of source			
	Migration of HC			
TRAP	Trap			
	Presence of closure	OK / Fail / Not relevant		
	Presence of top seal			
	Presence of lateral seal			
RESERVOIR	Reservoir			
	Presence of reservoir	OK / Fail / Not relevant		
	Quality of reservoir			
COMMENT	Dry well comments			P&A'd - Insufficient hydrocarbon column
:::END:::				