2.7.3 MDT Pressure

Test No.	Depth mMD RKB	Depth mTVD MSL	Initial Hydrostatic Pressure Quartz	Initial Hydrostatic Pressure Strain	Formation Pressure Quartz	Formation Pressure Strain	Final Hydrostatic Pressure Quartz	Final Hydrostatic Pressure Strain	Formation Pressure sg EMW	Test Temp. degC	Good Data? Y/N	Probe Used PS1/PS2	Pretest Volume cc	Quartz Mobility md/cp	Remarks
1	1177.5	1154.2	154.279	154.360	127.323	127.330	154.273	154.320	1.103	32.8	y	PS1	9.7	8.9	redone on way up
2	1179.4	1156.1	154.611	154.540	127.527	127.420	154.573	154.550	1.103	30.9	y	PS1	20	230.3	good
3	1181.1	1157.8	154.845	154.780	127.694	127.600	154.801	154.790	1.102	31.4	y	PS1	20	154.6	good
4	1185.1	1161.8	155.372	155.320	128.101	128.020	155.319	155.330	1.102	31.7	y	PS1	20	531.2	good
5	1189.9	1166.6	155.978	155.930					-	32.0	n	PS1	9.7		supercharged,try reset
6	1194.1	1170.8	156.526	156.510	129.033	128.980	156.486	156.520	1.102	32.4	y	PS1	20	433.8	good
7	1195	1171.7	156.665	156.640					-	32.7	n	PS1	9.8		supercharged, try reset
8	1205.9	1182.6	158.109	158.090	130.293	130.250	158.033	158.080	1.102	32.8	y	PS1	9.9	17.6	set volume to 10cc
9	1211	1187.7	158.754	158.750	130.879	130.820	158.705	158.750	1.102	33.1	y	PS1	10	103.0	set volume to 10cc
10	1250	1226.6	164.147	164.110	131.951	131.900	163.763	163.800	1.076	33.5	y	PS1	18	11.9	set volume to 20cc
11	1251.2	1227.8	163.964	163.940	132.032	131.990	163.921	163.960	1.076	33.9	y	PS1	10	14.4	set volume to 10cc
12	1262.9	1239.5	165.468	165.470	133.175	133.120	165.442	165.470	1.075	34.4	y	PS1	9.9	114.8	set volume to 10cc
13	1266	1242.6	165.903	165.880	133.510	133.460	165.849	165.860	1.075	34.6	y	PS1	10	192.3	set volume to 10cc
14	1277	1253.5	167.351	167.330	134.656	134.600	167.255	167.300	1.075	34.8	y	PS1	9.8	209.8	set volume to 10cc
15	1291	1267.4	169.243	169.210	136.655	136.610	169.048	169.080	1.080	35.0	y	PS1	9.9	32.7	set volume to 10cc
16	1309	1285.1	171.673	171.660	139.227	139.180	171.350	171.390	1.085	35.1	y	PS1	9.9	20.2	set volume to 10cc
17	1315	1291.0	172.199	172.170	139.902	139.850	172.112	172.160	1.085	35.4	y	PS1	9.84	51.8	set volume to 10cc

Table 2.7.3.1 Pressure Points for Realgrunnen and Snadd Formations

KOBBE AND KLAPPMYSS FORMATIONS

Totally 108 pre-tests were attempted in the interval 1800.1m to 2473.3m including pressure for scanning stations and fluid sampling. Of these 58 pre-tests were good, 25 were dry and 25 had lost seal or not stable.

Run No.	Test No.	Depth mMD RKB	Depth mTVD MSL	Initial Hydrostatic Pressure bars Quartz	Initial Hydrostatic Pressure bars Strain	Formation Pressure bars Quartz	Formation Pressure bars Strain	Final Hydrostatic Pressure bars Quartz	Final Hydrostatic Pressure bars Strain	Formation Pressure sg EMW	Test Temp. degC	Good Data? Y/N	Probe Used PS1/PS2	Pretest Volume cc	Quartz Mobility md/cp	Remarks
2C	1	1800.1	1720.3	218.547	218.470	190.192	190.150	218.208	218.260	1.112	41.9	Y	PS1	20	650.0	Good test (Gas)
2C	2	1808.1	1727.2	219.172	219.150	190.327	109.300	219.994	219.080	1.109	42.4	Y	PS1	20	6497	Good test (Gas)
2C	3	1812.2	1730.7	219.570	219.590	190.405	190.400	219.447	219.510	1.107	42.8	Y	PS1	20	1839	Good test (Gas)
2C	4	1826.1	1742.5	220.979	221.000	190.629	190.620	220.849	220.920	1.101	43.2	Y	PS1	20	371.8	Good test (Gas)
2C	5	1830	1745.8	221.361	221.380	190.677	190.670	221.250	221.310	1.099	43.5	Y	PS1	20	695.9	Good test (Gas)
2C	6	1840.1	1754.4	222.550	222.560	190.852	190.840	222.294	222.340	1.095	43.8	Y	PS1	20	374.8	Good test (Gas)
2C	7	1849.1	1762.0	223.404	223.420	191.000	190.990	223.229	223.260	1.091	44.1	Y	PS1	20	562.5	Good test (Gas)
2C	8	1853	1765.4	223.784	223.800	191.072	191.050	223.625	223.800	1.089	44.3	Y	PS1	20	964.0	Good test (Gas)
2C	9	1861	1772.1	224.770	224.780	191.405	191.380	224.447	224.470	1.087	44.5	Y	PS1	20	325.1	Good test (Oil)
2C	10	1867.1	1777.3	225.338	225.330	191.726	191.710	225.120	225.100	1.086	44.7	Y	PS1	20	35.5	Good test (Oil)
2C	11	1876	1784.8	226.225	226.260	192.425	192.400	226.047	226.020	1.085	44.9	Y	PS1	20	239.5	Good test (Oil)
2C	12	1878	1786.5	226.359	226.360	192.530	192.510	226.264	226.240	1.085	45.1	Y	PS1	20	51.8	Good test (Oil)
2C	13	1883.1	1790.8	226.895	226.900	192.805	192.800	226.771	226.800	1.084	45.3	Y	PS1	20	12.4	Good test (Oil)
2C	14	1882.2	1790.0	227.519	227.520					-	45.2	N	PS1	20		TIGHT
2C	15	1896	1801.6	228.281	228.280	193.573	193.550	228.129	228.140	1.081	45.6	Y	PS1	20	42.3	Good test (Oil)
2C	16	1897.1	1802.6	228.261	228.270	193.625	193.600	228.247	228.250	1.081	45.7	Y	PS1	20	89.3	Good test (Oil)
2C	17	1912	1815.1	230.012	230.020	194.459	194.430	229.771	229.760	1.078	45.8	Y	PS1	20	378.1	Good test (Oil)
2C	18	1914.1	1816.9	230.084	230.090	194.578	194.540	229.994	229.960	1.078	45.9	Y	PS1	20	367.2	Good test (Oil)
2C	19	1923.1	1824.4	231.239	231.230	195.070	195.040	230.937	230.930	1.076	46.0	Y	PS1	20	42.6	Good test (Oil)
2C	20	1925.1	1826.1	231.268	231.260	195.167	195.140	231.144	231.110	1.076	46.2	Y	PS1	20	188.7	Good test (Oil)
2C	21	1930	1830.2	231.666	231.670	195.422	195.390	231.662	231.630	1.075	46.4	Y	PS1	20	70.5	Good test (Oil)
2C	22	1932.1	1832.0	231.905	231.900	195.525	195.490	231.843	231.830	1.074	46.5	Y	PS1	20	18.5	Good test (Oil)
2C	23	1936.1	1835.4	232.404	232.390	195.732	195.700	232.265	232.330	1.074	46.6	Y	PS1	20	8.3	Good test (Oil)
2C	24	1939	1837.8	232.608	232.600	195.900	195.860	232.555	233.040	1.073	46.8	Y	PS1	20	122.8	Good test (Oil)
2C	25	1944.2	1842.2	233.156	233.150	196.171	196.120	233.072	233.000	1.072	46.9	Y	PS1	20	178.4	Good test (Oil)
2C	26	1949.7	1846.8	233.736	233.720	196.689	196.640	233.668	233.620	1.072	47.1	Y	PS1	20	74.5	Good test (s. charge?)
2C	27	1957	1853.0	234.521	234.500	197.163	197.150	234.395	234.340	1.071	47.2	Y	PS1	20	2.4	Good test (s. charge?)
2C	28	1960.6	1856.0	234.857	234.840	198.457	198.420	234.780	234.730	1.077	47.3	Y	PS1	20	17.6	Good test
2C	29	1985	1876.6	237.883	237.870	200.227	200.170	237.331	237.270	1.074	47.4	Y	PS1	10	125.8	Good test
2C	30	1989.1	1880.0	237.881	237.860	200.504	200.450	237.776	237.730	1.074	47.5	Y	PS1	10	151.7	Good test
2C	31	1957.5	1853.4	234.454	234.137	197.137	197.100			1.071	47.6	Y	PS1	10	21.1	Good test and redo test
2C	32	1957.5	1853.4			197.127	197.090	234.454	234.400	1.071	47.6	Y	PS1	10	15.5	Good test
2C	33	1950	1847.1	233.663	233.650					-	47.6	N	PS1	10		Reset tool
2C	34	1950	1847.1	233.663	233.650	196.677	196.630	233.671	233.630	1.072	47.6	Y	PS1	10	55.1	Good test
2C	35	2045.1	1927.0	243.724	243.700	205.603	205.540	243.615	243.560	1.075	48.4	Y	PS1	20	37.0	Good test
2C	36	2055.1	1935.4	244.988	244.950					-		N	PS1	20		Reset tool

Table 2.7.3.2 Pressure Points for Kobbe and Klappmyss Formations

Run No.	Test No.	Depth mMD RKB	Depth mTVD MSL	Initial Hydrostatic Pressure bars Quartz	Initial Hydrostatic Pressure bars Strain	Formation Pressure bars Quartz	Formation Pressure bars Strain	Final Hydrostatic Pressure bars Quartz	Final Hydrostatic Pressure bars Strain	Formation Pressure sg EMW	Test Temp. degC	Good Data? Y/N	Probe Used PS1/PS2	Pretest Volume cc	Quartz Mobility md/cp	Remarks
2C	37	2055.1	1935.4	244.988	244.950					-		N	PS1	20		Reset tool
2C	38	2055.1	1935.4	244.988	244.950	206.231	206.180	244.634	244.560	1.073	49.1	Y	PS1	20	12.1	Good test
2C	39	2071.2	1948.9	246.816	246.780	207.217	207.150	246.319	246.250	1.071	49.5	Y	PS1	20	137.8	Good test
2C	40	2075.1	1952.2	246.913	246.870	207.576	207.510	246.567	246.700	1.071	49.9	Y	PS1	20	52.7	Good test
2C	41	2097.6	1971.1	249.372	249.330					-		N	PS1	20		TIGHT
2C	42	2099	1972.3	249.325	249.280					-		N	PS1	20		TIGHT
2C	43	2099.2	1972.5	249.358	249.310					-		N	PS1	20		TIGHT
2C	44	2104	1976.5	249.848	249.810	210.677	210.640	249.779	249.740	1.074	51.2	Y	PS1	10	2.5	Good test
2C	45	2109.2	1980.9	250.425	250.400					-		N	PS1	10		Reset tool
2C	46	2109.2	1980.9	250.425	250.400	210.930	210.890			1.073	51.4	Y	PS1	10	10.7	Good test
2C	47	2122	1991.6	251.846	251.830	212.225	212.170	251.698	251.650	1.074	51.5	Y	PS1	10	22.9	Good test
2C	48	1858.5	1770.0	224.806	224.880	191.254	191.320	224.400	224.430	1.087	47.3	Y	PS1	20	16.0	Good test
2C	49	1868	1778.0	225.577	225.620	191.704	191.740	225.381	225.390	1.085	46.4	Y	PS1	20	88.8	Good test
2C	50	1964	1858.9	235.878	235.890					-		N	PS1	10		TIGHT
2C	51	1964.5	1859.3	235.480	235.470	199.153	199.140	235.404	235.370	1.079		Y	PS1	10	1.1	Good test (s. charge?)
2C	52	1990	1880.7	238.342	238.340	200.576	200.530			1.074	47.6	Y	PS1	10		Good test and redo test
2C	53	1990	1880.7	238.342	238.340	200.569	200.590	238.014	237.990	1.074	47.6	Y	PS1	10	55.2	Good test
2C	54	2007	1895.0	240.178	240.170					-		N	PS1	10		TIGHT
2C	55	2006	1894.1	239.841	239.820	202.238	202.190	239.760	239.760	1.075	48.4	Y	PS1	10	54.7	Good test
2C	56	2060	1939.5	245.693	245.690	206.600				-		N	PS1	10		Reset tool
2C	57	2060	1939.5	245.693	245.690	206.678	206.640	245.341	245.290	1.074	49.6	Y	PS1	10		Good test and redo test
2C	58	2060	1939.5	245.693	245.690	206.719	206.680	245.329	345.320	1.074	49.6	Y	PS1	10	60.5	Good test
2C	59	2125.1	1994.2	252.649	252.620					-		N	PS1	10		S. charge, redo test
2C	60	2125.1	1994.2	252.649	252.620	212.714	212.690	252.060	252.030	1.075	51.4	Y	PS1	10	1.0	Good test
2C	61	2134.1	2001.8	253.049	253.020					-		N	PS1	10		S. charge, redo test
2C	62	2134.1	2001.8	253.049	253.020	213.597	213.580	252.961	252.970	1.075	52.1	Y	PS1	10	1.8	Good test
2C	63	2140.2	2006.9	253.847	252.720					-		N	PS1	10		TIGHT
2C	64	2152	2016.8	255.136	255.120	216.145	216.130	254.882	254.870	-	52.5	N	PS1	10	2.1	Good test (s. charge?)
2C	65	2167.1	2029.5	256.944	256.940					-		N	PS1	10		TIGHT
2C	66	2179.5	2039.9	258.137	258.130	217.282	217.250	257.756	257.750	1.074	53.1	Y	PS1	10	52.3	Good test
2C	67	2201	2058.0	260.451	260.440	219.545	219.510			1.075	53.3	Y	PS1	10		Good test and redo test
2C	68	2201	2058.0	260.451	260.440	219.344	219.310	259.988	259.970	1.074	53.5	Y	PS1	10	21.7	Good test
2C	69	2430	2250.4	284.700	284.620					-	56.6	N	PS1	10		TIGHT, Reset tool
2C	70	2430	2250.4	284.700	284.620					-		N	PS1	10		TIGHT
2C	71	2446.1	2264.0	286.663	286.630					-	58.2	N	PS1	10		TIGHT
2C	72	2457.3	2273.4	287.695	287.660	243.071	243.030			1.079		Y	PS1	20		Good test

Table 2.7.3.3 Pressure Points for Kobbe and Klappmyss Formations

Run No.	Test No.	Depth mMD RKB	Depth mTVD MSL	Initial Hydrostatic Pressure bars Quartz	Initial Hydrostatic Pressure bars Strain	Formation Pressure bars Quartz	Formation Pressure bars Strain	Final Hydrostatic Pressure bars Quartz	Final Hydrostatic Pressure bars Strain	Formation Pressure sg EMW	Test Temp. degC	Good Data? Y/N	Probe Used PS1/PS2	Pretest Volume cc	Quartz Mobility md/cp	Remarks
2C	73	2457.3	2273.4	287.695	287.660	243.062	243.030	287.487	287.520	1.079	59.7	Y	PS1	20	6.7	Repeat test
2C	74	2465.5	2280.3	288.564	288.540	243.754	243.730	288.384	288.410	1.079	60.1	Y	PS1	20	34.5	Good test
2C	75	2473.3	2286.8	289.508	289.480	244.877	244.860	289.232	289.260	1.081	60.4	Y	PS1	20		Good test
2C	76	2430	2250.4	284.522	284.540					-		N	PS1			Failed to achieve seal
2C	77	2430	2250.4							-		N	PS1			TIGHT
2C	78	2430	2250.4	284.522	284.540					-			PS1			TIGHT
2D	79	1949.2	1846.4	233.826	233.910	196.638	196.750	233.639	233.760	1.072	47.0	Y	PS1	20	27.0	Good scan.pump 33.5 litres
2D	80	1943.7	1841.8	233.038	233.140					-		N	PS1	20		TIGHT
2D	81	1944.1	1842.1	233.195	233.280	196.177	196.280			-	48.5	N	PS1	20	1.5	TIGHT
2D	82	1913	1816.0	229.930	230.030	194.386	194.490			1.078		Y	PS1	20	200.0	Took 12 oil samples
2D	83	1852.9	1765.3	233.409	233.600	190.987	191.100	223.431	223.400	1.089	46.8	Y	PS1	20	12.7	Good test
2D	84	1853.3	1765.6	223.237	223.280					-		N	PS2			Failed to achieve seal
2D	85	1849	1762.0	223.152	223.240	190.889	190.980	223.178	223.240	1.090	46.4	Y	PS1	10	283.0	Scanning station
2D	86	1808.1	1727.2	218.896	218.990					-		Y	PS1	10		Took 3 gas samples
2F	87	2055	1935.3	244.365	244.360					-	49.5	N	PS1	10		TIGHT
2F	88	2071.2	1948.9	246.127	246.200					-		N	PS1			No seal-reset
2F	89	2071.2	1948.9	246.028	246.100					-		N	PS1			No seal. Rugose hole?
2F	90	2045.1	1927.0	243.425	243.530					-		N	PS1		0.2	TIGHT
2F	91	2045.1	1927.0	243.576	243.660					-		N	PS2			move.try at 2043.5
2F	92	2043.5	1925.6	243.179	243.260					-		N	PS1			plugged probe?.try clean
2F	93	1989.1	1880.0	237.342	237.460					-	49.9	N	PS1	10	3.0	TIGHT
2F	94	1943.7	1841.8	232.631	232.730					-		N	PS1	10	<1	move down
2F	95	1944.2	1842.2	232.621	232.690					-		N	PS1	9		TIGHT
2F	96	1944.2	1842.2	232.708	232.720					-		N	PS2	10		TIGHT
2F	97	1944	1842.0							-		N	PS2			TIGHT
2F	98	1913	1816.0	229.510						-		N	PS1			adandon
2F	99	1989.1	1880.0	237.590	237.620	200.428	200.510	237.440	237.500	1.074	49.9	Y	PS1	20	16.6	water station samples
2F	100	2060	1939.5	244.954	245.010	206.629	206.700	245.002	245.060	1.073	52.3	Y	PS1	10	30.0	scanned water
2F	101	2045.1	1927.0	243.685	243.760					-		N	PS1	10		TIGHT/pos probe plugged
2F	102	2045	1926.9	243.511	243.570					-		N	PS1	20		TIGHT/pos probe plugged
2F	103	2044.8	1926.7	243.498	243.560					-		N	PS1	15		TIGHT/pos probe plugged
2F	104	2044.9	1926.8	243.512	243.580					-		N	PS1	20		TIGHT/pos probe plugged
2F	105	2045.1	1927.0	243.549	243.620					-		N	PS1	20		TIGHT/pos probe plugged
2F	106	2024.2	1909.4	243.575	243.630					-		N	PS1	20		TIGHT/pos probe plugged
2F	107	2045.1	1927.0	243.595	243.610	205.523	205.550	243.601	243.605	1.074		Y	PS2	20	174.5	Oil samples
2F	108	1853	1765.4	223.398	223.500	190.995	190.990	223.390	223.500	1.089	48.1	Y	PS2	20	194.2	Scanning

Table 2.7.3.4 Pressure Points for Kobbe and Klappmyss Formations

2.7.4 Fluid Sampling

Fluid sampling

The MDT (Modular Dynamic Tester) was used for fluid sampling in the reservoirs. Water from Realgrunnen Group gas, oil and water from Kobbe Formation and oil from Klappmyss Formation were sampled.

Station #	DLIS	MD (m)	# Sample taken / Scanning		Fluid type	Form Press (bar)	Hydro Press (bar)	Mobility (MD/CP)	Form Temp (DegC)	Hydro Temp (DegC)	Probe type
1	273	1177.50	0		Dead Oil / Water	127.323	154.28	8.9	34	32	PQ
2	274	1177.50	4		Water	127.323	154.28	8.9	34	32	PQ
3	280	1185.60	3		Water	127.864	155.19	531.2	31.7	31.7	PQ

Station #	DLIS	MD (m)	# Sample taken / Scanning		Fluid type	Form Press (bar)	Hydro Press (bar)	Mobility (MD/CP)	Form Temp (DegC)	Hydro Temp (DegC)	Probe type
1	195	1949.20	Scanning		Oil / Water	196.643	233.84	27	47	46.8	PQ
2	200	1913.00	12 samples		Oil	194.386	229.93	200	48.4	48.3	PQ
3	207	1849.00	Scanning		Gas / Condensate	190.889	223.13	283	46.8	46.6	PQ
4	210	1808.10	3 samples		Gas	190.208	218.90	499	46.4	45.3	PQ

Station #	DLIS	MD (m)	# Sample taken / Scanning		Fluid type	Form Press (bar)	Hydro Press (bar)	Mobility (MD/CP)	Form Temp (DegC)	Hydro Temp (DegC)	Probe type
1	254	1989.10	4 samples		Water	200.428	237.305	16.8	49.3	48.9	PQ
2	256	2060.00	Scanning		Oil / Water	206.390	244.955	16.9	52.2	52.2	PQ
3	267	2045.10	7 samples		Oil	205.521	243.583	73.9	51.7	51.8	PS
4	269	1853.00	Scanning		Gas / Condensate	190.993	223.358	194.2	49.9	51.3	PS

The samples were sent to Reslab in Stavanger for PVT analysis. Final PVT results will be issued in a separate report.
The results from sample validation and the quick analysis of GOR and fluid density are listed below.

Sample point	Atmospheric Flash GOR	Reservoir pressure	Reservoir temperature	Live Fluid Density at Saturation Pressure (measured)	Oil formation volume factor at Reservoir pressure	Oil formation volume factor at Saturation pressure	Molecular Weight of Live Fluid (calculated)	Molecular Weight of STO (measured)	Molecular Weight of flashed gas (calculated)	Ideal gas gravity (calculated)	STO Density at 15 °C (measured)
[m MD RT]	Nm3/m3	Bara	°C	Kg/m3	m3 / m3 STO	m3 / m3 STO	gr / mole	gr / mole	gr / mole	(air = 1.000)	Kg/m3
1913.0	-	194.3	48.7	-	-	-	-	-	-	-	-
1913.0	219.4	194.3	48.7	656.2	1.624	1.625	77.2	177.6	27.56	0.951	815.7
1913.0	-	194.3	48.7	-	-	-	-	-	-	-	-
1913.0	214.1	194.3	48.7	657.8	1.609	1.611	77.8	177.2	27.35	0.944	815.2
1913.0	220.9	194.3	48.7	657.8	1.640	1.641	77.5	180.0	27.75	0.958	817.8
1913.0	208.8	194.3	48.7	653.4	1.582	1.584	77.0	173.0	25.98	0.870	811.8
1808.1	n.d.	190.2	46.3								
1808.1	n.d.	190.2	46.3								
1808.1	n.d.	190.2	46.3								
2045.1	-	205.5	53.0	-	-	-	-	-	-	-	-
2045.1	-	205.5	53.0	-	-	-	-	-	-	-	-
2045.1	134.2	205.5	53.0	723.2	1.337	1.336	100.9	214.1	22.86	0.789	837.7
2045.1	138.3	205.5	53.0	721.5	1.342	1.338	99.2	213.4	22.53	0.778	838.1
2045.1	134.7	205.5	53.0	719.7	1.334	1.331	99.9	212.6	21.95	0.758	837.9
2045.1	128.1	205.5	53.0	724.1	1.314	1.313	102.4	212.8	22.19	0.766	837.1

2.7.5 Kobbe Injection Test

Introduction

A well test was planned in order to achieve the major dynamic parameters to characterize the Kobbe Formation. which was never tested before. (From analysis of the logs carried out during the drilling phase the Realgrunnen Group was found to be unsuitable for testing purposes and was thus dropped from the testing program).

Due to strong environmental regulations imposed in the Barents Sea area. Unconventional Well Testing procedures were required in order to avoid oil flaring and the risk of an oil spill. The most suitable technique was selected from the following three alternatives:

- Downhole Production Reinjection, with ESP pump.
- Injection/fall-off test.
- Conventional well testing with treatment, storage and shipment of oil.

The first choice was the combined use of a down hole Production and Reinjection System. followed by a short injection test. Due to safety concerns this alternative was not considered feasible for the time being since some important test could not be performed in due time. The third alternative was also dropped due to the complexity of producing and storing the high quantity of oil required for a complete conventional well testing.
Finally the **Injection/Fall Off** test was selected as the most appropriate alternative as it guarantees relatively high value of the information along with very low associated safety and environmental risks.

Before the injection test, a very short clean-up period was also performed in order to recover a significant volume of dead oil for both flow assurance and separator test analysis.
This was followed by a short build-up for further confirmation of the interpretation results achieved in the injection test analysis.

Summarizing the objectives of the testing were to:

- Conduct all operations with zero discharge to the sea;
- Determine reservoir pressure and temperature;
- Evaluate average formation properties (Kh. K. Skin);
- Calculate well productivity (PI);
- Investigate for expected channel boundaries and other possible permeability barriers/heterogeneities;
- Collect representative reservoir fluid samples.

Testing Execution:

The test was carried out between the 2nd and the 18th November 2006 and can be briefly summarized as follows:

A DST (Drill Stem Test) string was successfully run in the well after the casing clean out string was pulled out, following all standard space out and equipment testing procedures. The string was made of (See also fig. 1) perforating guns, 7" testing packer, bottom hole testing and reversing valves, down hole gauge carriers, Subsea Testing Tree (allowing for emergency disconnection of the rig) and Surface Flow Head.

The 7" Test Packer was set @ 1901 m and N2 was displaced through tubing to provide underbalanced conditions for the perforation operation.

The Kobbe Formation was perforated on the interval 1911-1927 m, utilizing 4 1⁄2 HSD 72 (5 SPF, Power Jet Charge, explosive HMX) with HDF firing mechanism. Immediately after the perforation a decrease of 1 bar was observed in the tubing pressure, indicating that the well was perforated with 1 bar overbalance (the planned underbalance of 13.8 bar was not achieved probably due to the imprecision of both the measurement readings of the annulus returns to the rig trip tank and the N2 unit readings for the N2 pumped volume).

The well was open to flow for 5 hours for clean up (unstable flow) and a total of 30.48 m^3 of dead oil were recovered. At the end of the flowing period, with the well stabilized and cleaned 12 m^3 of dead oil were sampled and properly stored for sampling purposes. The well was than shut in for a 6 hrs. Build up period.

The injection test was carried out after some required adaptations to the original plan (imposed by operational limitations).
The first injection period was performed over 7.9 hrs, with a brine injection rate between 46 and 56 m^3/d. followed by a "Fall-Off" period of 8.6 hrs.
The second injection period was instead 16.7 hrs, with a brine injection rate between 66 – 75 m^3/d. This was followed by a second "Fall-Off" of 48 hrs.

Injection test was concluded, the well killed and conditioned and the DST string retrieved after unsetting the packer.

The results from the test were mainly achieved by the "Fall Off" 1, and the post clean-up build-up interpretation. "Fall Off 2, response was considered unreliable and hence was not interpreted. The results are summarized in the following table:

3.5.7 Mud Summary Report

MI SWACO

DRILLING FLUID PROPERTIES

Eni Norge

OPERATOR: ENI Norge
WELL: 7122/7-4S
RIG: Polar Pioneer

FSR no.	Date	Depth	MW	T	FV	VG-meter readings @ 50C						AV	PV	YP	Gel 10 sec	Gel 10 min	API	pH	Pf	Cl-	Solids corr	MBT	Sand	KCOOH	K+
						600	300	200	100	6	3														
		m	SG	°C	s	lb/100ft²							cP	Pa	Pa	Pa	mls			mg/l	%	kg/m³	%	kg/m³	mg/l
36" SECTION				SPUDMUD																					
1	20-Sep-06	392	1.03		> 120																				
2	21-Sep-06	449	1.03		> 120																				
3	22-Sep-06	449	1.03		> 120																				
Minimum			1.03																						
Maximum			1.03																						
Average			1.03																						
9 7/8" SECTION				SPUDMUD																					
4	23-Sep-06	562	1.03		> 120																				
5	24-Sep-06	1050	1.03		> 120																				
Minimum			1.03																						
Maximum			1.03																						
Average			1.03																						
17.5" SECTION				SPUDMUD/ 1.20 sg NaCl Displacement Mud																					
6	25-Sep-06	849	1.03		> 120																				
7	26-Sep-06	1050	1.2		> 120	48	34	28	21	7	5		14	10	4	6	8	8.0							
8	27-Sep-06	1050	1.2		> 120	48	34	28	21	7	5		14	10	4	6	8	8.0							
9	28-Sep-06	1050	1.2		> 120	48	34	28	21	7	5		14	10	4	6	8	8.0							
10	29-Sep-06	1050	1.2		> 120	48	34	28	21	7	5		14	10	4	6	8	8.0							
11	30-Sep-06	1050	1.2		> 120	48	34	28	21	7	5		14	10	4	6	8	8.0							
Minimum			1.03			48	34	28	21	7	5		14	10	4	6	8	8.0							
Maximum			1.20			48	34	28	21	7	5		14	10	4	6	8	8.0							
Average			1.17			48	34	28	21	7	5		14.0	10.0	4.0	6.0	8.0	8.0							

12 1/4" SECTION				FORMPRO																				
12	1-Oct-06	1183	1.3	21	55	51	39	33	26	10	8		12	13.5	4.5	6.5	6.4	9.5		10000	24	11	0.2	363	168000
13	2-Oct-06	1198	1.3	17	55	50	37	32	25	10	8		13	12	4.5	6.5	6.8	9.5		9000	24	11	0.2	392	182000
14	3-Oct-06	1216	1.3	21	50	46	34	30	23	9	7		12	11	4	6	7.2	9.4		9000	25	11	0.1	383	178000
15	4-Oct-06	1371	1.31	25	54	50	37	30	23	8	6		13	12	3.5	6.5	6.4	9.5		8000	25	11	0.2	356	166000
16	5-Oct-06	1716	1.32	26	54	47	32	21	19	6	5		15	8.5	3	12.5	7.5	9.0		7000	25	21	0.2	315	146000
17	6-Oct-06	1716	1.32	26	54	53	36	30	21	8	6		17	9.5	3	14	7.5	9.0		7000	26	21	0.2	315	146000
18	7-Oct-06	1716	1.31	22	54	53	36	30	21	8	6		17	9.5	3	14	7.5	9.0		7000	26	21	0.2	315	146000
19	8-Oct-06	1716	1.3	22	52	47	33	27	20	8	6		14	9.5	4	12	7.5	9.0		7000	25	21	0.2	315	146000
20	9-Oct-06	1716	1.3	18	63	50	35	30	21	8	6		15	10	3.5	13	7.5	9.0		7000	26	21	0.2	315	146000
21	10-Oct-06	1716	1.3	18	63	50	35	30	21	8	6		15	10	3.5	13	7.5	9.0		7000	26	21	0.2	315	146000
22	11-Oct-06	1716	1.3	16	62	49	34	28	21	7	6		15	9.5	4	8	7.5	10.2		7000	25	21	0.2	328	153000
23	12-Oct-06	1716	1.3	13	50	41	30	25	19	7	5		11	9.5	3.5	6	6.6	9.0		6000	23	7	0.1	370	172000
Minimum			**1.30**	**13**	**50**	**41**	**30**	**21**	**19**	**6**	**5**		**11**	**9**	**3**	**6**	**6**	**9.0**		**6000**	**23**	**7**	**0.1**	**315**	**146000**
Maximum			**1.32**	**26**	**63**	**53**	**37**	**32**	**25**	**10**	**8**		**17**	**12**	**5**	**14**	**8**	**10.2**		**9000**	**26**	**21**	**0.2**	**392**	**182000**
Average			**1.31**	**20.4**	**56**	**49**	**34**	**28**	**21**	**8**	**6**		**14.3**	**10.1**	**3.6**	**10.1**	**7.2**	**9.2**		**7364**	**25.1**	**17**	**0.2**	**338**	**157000**

8 1/2" SECTION				FORMPRO																				
24	13-Oct-06	1794	1.3	21	61	50	37	32	25	9.5	7.5		13	12	4	8.5	5.2	9.7		7500	25	6	0.2	406	189000
25	14-Oct-06	1820	1.3	20	61	46	34	29	24	8	6.5		12	11	4	7	5	9.6		7500	25	6	0.2	406	189000
26	15-Oct-06	1840	1.3	20.5	68	67	43	37	28	12	10		10	24	6	10	5	9.7		7500	24	6	0.3	414	192000
27	16-Oct-06	1887	1.3	21	72	56	38	33	24	10	8		10	18	5	9	5	9.5		7500	27	6	0.3	414	192000
28	17-Oct-06	1973	1.3	22	64	52	38	32	23	9	7		11	14	6	10	5	9.4		7000	25.5	6	0.4	414	192000
29	18-Oct-06	2052	1.3	18	62	51	38	33	25	9.5	7		13	12.5	4.5	8.5	5.4	9.5		6500	25	6	0.3	428	200000
30	19-Oct-06	2064	1.3	18	61	49	37	32	24	9	7		12.5	12	4	8	5.5	9.5		7000	25	6	0.3	443	206000
31	20-Oct-06	2352	1.305	26	57	50	36	31	23	8.5	6.5		14	11	3.5	9	5.8	9.4		6000	26	12	0.3	440	210000
32	21-Oct-06	2550	1.3	23	59	45	33	27	20	7	6		12	10.5	5	10	5	9.2		6500	25	12	0.3	421	196000
33	22-Oct-06	2550	1.3			45	33	2	20	7	6		12	10.5	5	10	5.2	9.2		6300	26	12	0.2	421	196000
34	23-Oct-06	2550	1.3			44	32	27	20	7	6		12	10	5	9	5.4	9.3		6300	26	12	0.2	421	196000
35	24-Oct-06	2550	1.25	16	62	42	32	26	20	7	6		10	11	4	8	6.6	9.1		6000	20	6	0.2	315	146000
36	25-Oct-06	2550	1.25			48	35	30	22	8	7		13	11	3.5	5	5.8	9.1		6500	20	10	0.2	324	150000
37	26-Oct-06	2550	1.25			47	35	29	22	8	7		12	11.5	4	6	5.6	9.2		7000	20	14	0.2	335	156000
38	27-Oct-06	2550	1.25			47	35	29	22	8	7		12	11.5	4	6	5.6	9.2		7000	20	14	0.2	335	156000
39	28-Oct-06	2550	1.25			46	35	28	22	8	7		11	12	3.5	6	5.6	9.2		6800	20	14	0.2	333	152000
40	29-Oct-06	2550	1.25			46	35	28	22	8	7		11	12	3.5	6	5.6	9.2		6800	20	14	0.2	333	152000
41	30-Oct-06	2550	1.25			44	33	28	21	7	6		11	11	3	8	5.2	9.2		6800	20	10	0.15	352	164000
42	31-Oct-06	2550	1.25			46	33	29	23	8	7		13	10	4	8	5.6	9.1		6800	20	10	0.2	344	160000
43	1-Nov-06	2550	1.25			44	32	29	22	7	6		12	10	4	8	5.4	9.1		68000	20	10	0.2	344	160000
Minimum			**1.25**	**16**	**57**	**42**	**32**	**2**	**20**	**7**	**6**		**10**	**10**	**3**	**5**	**5**	**9.1**		**6000**	**20**	**6**	**0.2**	**315**	**146000**
Maximum			**1.31**	**26**	**72**	**67**	**43**	**37**	**28**	**12**	**10**		**14**	**24**	**6**	**10**	**7**	**9.7**		**68000**	**27**	**14**	**0.4**	**443**	**210000**
Average			**1.28**	**20.6**	**63**	**48**	**35**	**29**	**23**	**8**	**7**		**11.8**	**12.3**	**4.3**	**8.0**	**5.4**	**9.3**		**9865**	**23.0**	**10**	**0.2**	**382**	**177700**

HOLE SECTION	1	2	4	5	6
Hole size & depth	36" hole from seabed to 443m	9 7/8" pilot hole drill from 30" conductor shoe to 1050 m in order to check for shallow gas	17 1/2" hole to 1050m	12 1/4" hole to 1710m	8 1/2" hole to 2276m (TD of well)
Drilling fluids	Drilling fluid: Seawater/ High Viscous Sweeps with prehydrated bentonite mud Viscous Sweeps: Density: 1.03 SG pH: 8 – 9.5 FV > 100 Displace fluid at TD NaCl/polymer at 1.2 SG 150m3 of 1.5 SG Potassium Formate kill mud ready prior to spud	Drilling fluid: Seawater/ High Viscous Sweeps with prehydrated bentonite mud Viscous Sweeps: Density: 1.03 sg pH: 8 – 9.5 FV > 100 Displace fluid at TD NaCl/polymer at 1.2 SG 150m3 of 1.5 SG Potassium Formate kill mud ready prior to drill	Drilling fluid: Seawater/ High Viscous Sweeps with prehydrated bentonite mud Viscous Sweeps: Density: 1.03 sg pH: 8 – 9.5 FV > 100 Displace fluid at TD NaCl/polymer at 1.2 SG 150m3 of 1.5 SG Potassium Formate kill mud ready prior to drill	Drilling fluid: Formate Polymer Density: 1.30 SG PV: ALAP cP YP: 0-15 Pa pH: 8.5-9.5 API FL<8	Drilling fluid: Formate Polymer Density: 1.30 SG PV: ALAP cP YP: 0-15 Pa pH: 8.5-9.5 API FL<8 NB: The same mud has been used for running the 7" liner
Coring				Coring: N. 2 cores cut as per geological report	Coring: N. 4 cores cut as per geological report
Logging	Drilling: MWD- directional	Drilling: MWD- GR-Sonic- Res-directional	Drilling: MWD- GR-Sonic- Res-directional	Drilling: MWD- GR-Sonic- Res-directional Wireline logging performed as per geological report	Drilling: MWD- GR-Sonic- Res-directional Wireline logging be performed as per geological report
Casing	30" conductor to 443m Vetco MS-700 Hybrid Wellhead System 18 ¾" x 15000 psi 310 lbs/ft X-52 ST2 connection		18 ¾" Vetco MS-700 Wellhead System 18 ¾" x 15000 psi x-over to 13 3/8" 72 lbs/ft P110 casing to 1040m MD.	9 5/8" 53.5 lbs/ft P110 casing to 1704m MD.	A 7" contingency liner set: TOL at 1600m (liner shoe at 2539m).
Cement	Cement type: Class G Mixwater: Seawater(lead and tail) Density: 1.92 SG tail. 1.56 SG lead Spacer: Seawater Top cement: Lead to Seabed Tail to 421m		Cement type: Class G Mixwater: Sea water (lead) Fresh water (tail) Density: 1.56 SG lead. 1.92 SG tail Spacer: Seawater Top cement: Lead: Seabed Tail : 892m	Cement type: Class G Mixwater: Fresh water Density:1.90 SG tail Spacer: Tuned spacer E+ Top cement: Tail : 750m	Cement type: Class G Mixwater: Fresh water Density:1.90 SG tail Spacer: Tuned spacer E+ Top cement: Tail : 1500m