STATOIL

Norsk Hydro
Norsk Agip A/S
Enterprise Oil
PARTNERS

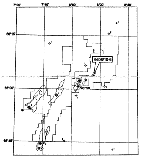
6608/10-6
WELL

Svale
PROSPECT STRUCTURE

COMPOSITE LOG
1 : 500

AREA:	**Nordland II**
LICENCE:	**PL128**
COORDINATES:	**66° 03' 55.95"N** **08° 15' 26.07"E**
KB:	**36m**
WATER DEPTH:	**378m**
TOTAL DEPTH:	**2115 mMD RKB**
FM. AT T.D.:	**Åre Formation**
SPUD DATE:	**29.02.2000**
RIG RELEASE:	**14.05.2000**
WELL STATUS:	**Temporary plugged**
RIG:	**West Navion**
CONTRACTOR:	**Smedvig**
GEOLOGIST :	**T. Klungsøyr, T.F. Kristensen, T. Svånå, O. Beyer, O. Hunnes, T-A. W. Johnsen, S. Solymar**
PREPARED BY:	**I. Winsvold**

LOCATION MAP



CASING DATA	LEAK OFF TESTS	VELOCITY SURVEY
30" 473.5 mMD 9 5/8" 1398 mMD 7" liner 2113 mMD	1,76 g/cc	Zero Offset VSP 2061 - 1519 m: 15 m spacing, 37 levels 1504 - 484 m: 30 m spacing, 35 levels

LOGS RUN — CONTRACTOR: Schlumberger / BHI (MWD)

PEX - HALS - CMR	MDT - GR	FMI - DSI - GR	VSP - GR	CBL - GR		MWD LOGGING
1A: 2111.0 - 1380.0 m	1A: 2071.0 - 1815.0 m 1B: 1826.7 - 1967.1 m	1A: 2108.0 - 1395.0 m	1A: 2061.0 - 484.0 m	1A 2065.0 - 1520.0 m		Run1: 477 - 570 m Run2: 570 - 1408 m Run3: 1408 - 1827 m Run4: 1827 - 2115 m

COMMENTS:

The well was drilled with all returns to seafloor down to 1408 mMD.
MWD memory data from 474 mMD to 1390 mMD. Wireline logs from 1390 mMD to TD.
Drillers depth is 4-6 m deeper than loggers depth.

LITHOLOGICAL SYMBOLS

CONGLOMERATE	SHALE	MARL	COAL LIGNITE	FORAMS	MICA
SAND SANDSTONE	LIMESTONE	TUFF	WOOD FRAGS	BURROWS	KAOLINITE
SILT SILTSTONE	CHALK	SALT GEN'L	FOSSILS GEN'L	PYRITE	CHERT
CLAY CLAYSTONE	DOLOMITE	ANHYDRITE	SHELL FRAGS	GLAUCONITE	SIDERITE

CUTTINGS/FLUORESCENCE ◊	OIL SHOW ●	OIL/GAS SHOW ✹	GAS SHOW ☼

AZIMUTH & INCLINATION

SIDEWALL CORES
1.5 ▶ SIDEWALL CORE
2.8 ▷ NO RECOVERY
R 1.2 ▶ ROTARY SIDEWALL CORE

CORES
CORE NO

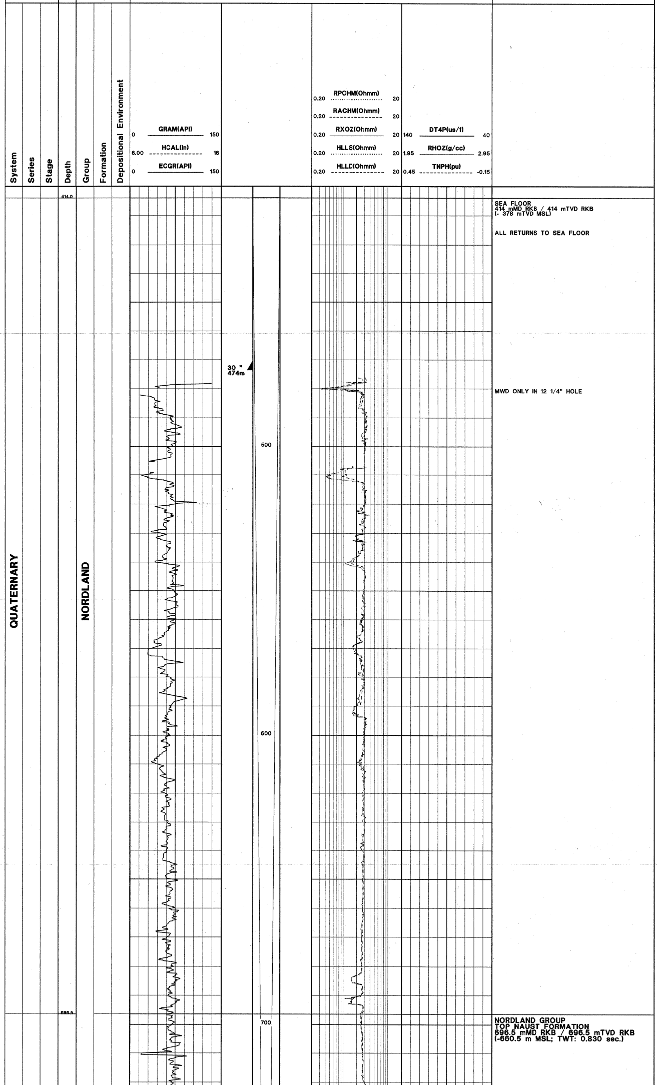
DST

RFT/FMT
SAMPLE

CASING SHOE / LINER

CHRONO STRAT UNCERTAINTY

Chron Strat		Litho Strat	Well Log	Lithological Descriptions

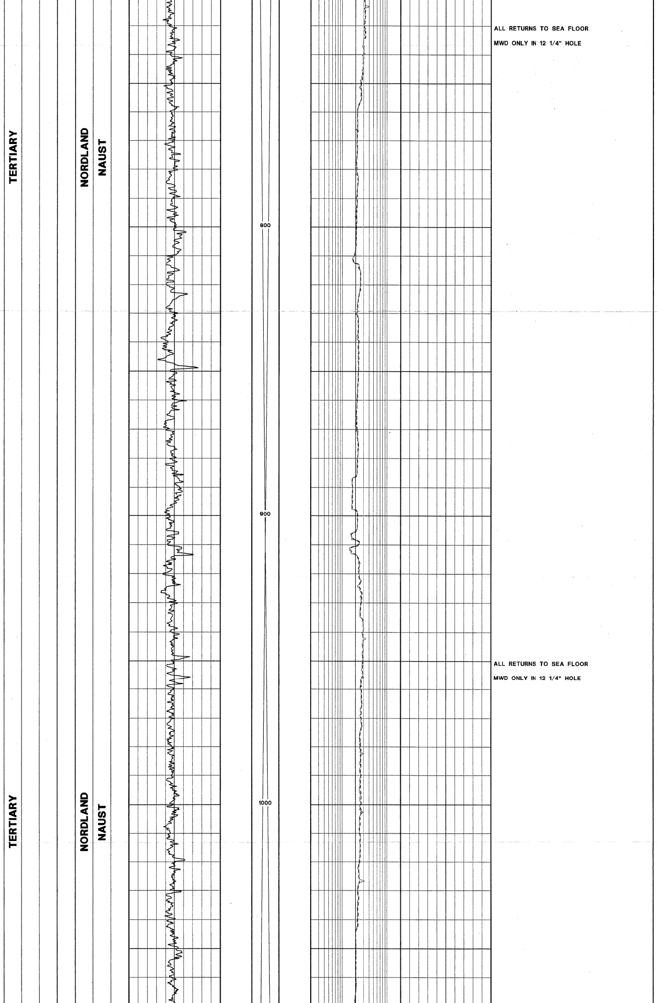


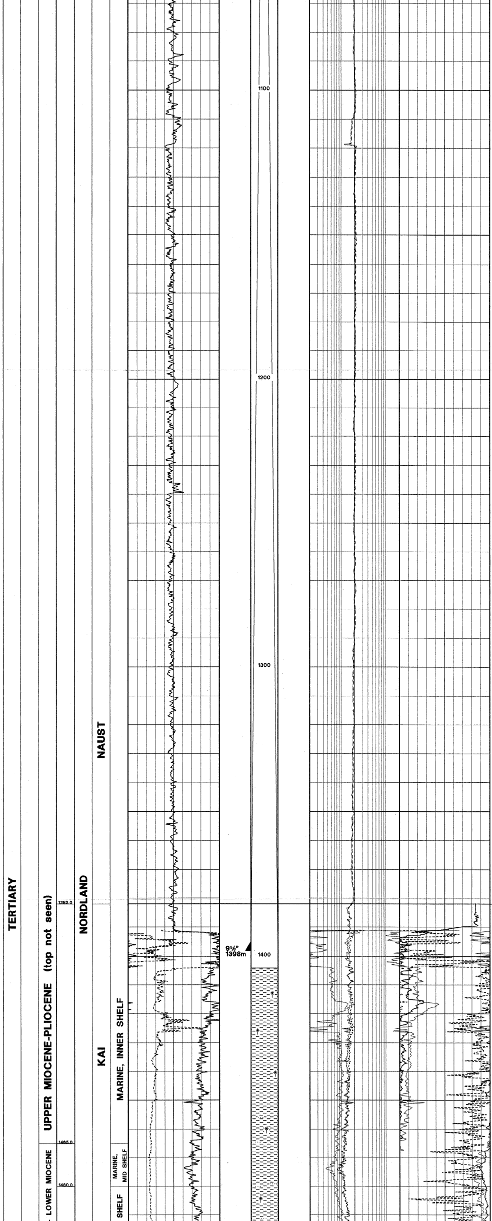
SEA FLOOR
414 mMD RKB / 414 mTVD RKB
(- 378 mTVD MSL)

ALL RETURNS TO SEA FLOOR

MWD ONLY IN 12 1/4" HOLE

NORDLAND GROUP
TOP NAUST FORMATION
696.5 mMD RKB / 696.5 mTVD RKB
(-660.5 m MSL; TWT: 0.830 sec.)





ALL RETURNS TO SEA FLOOR

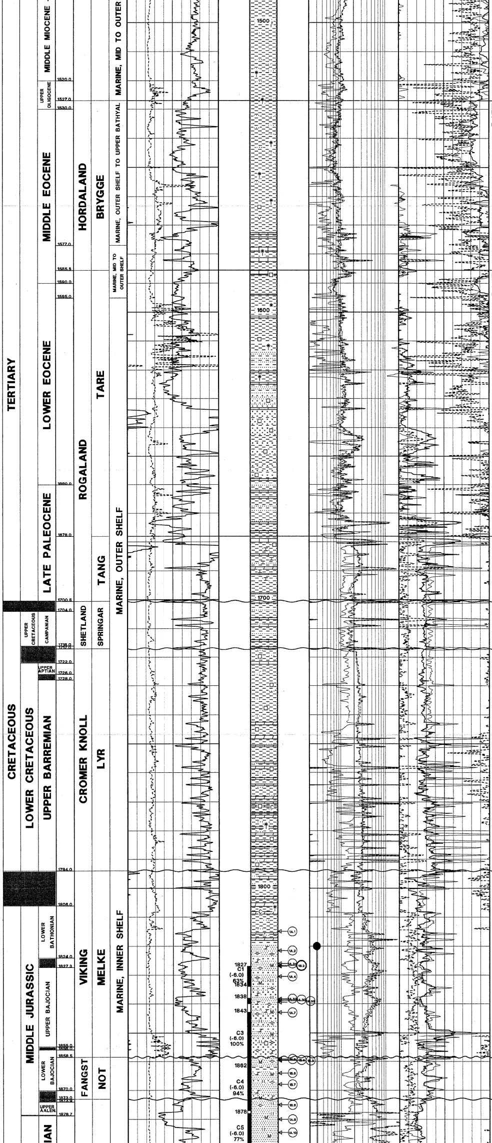
MWD ONLY IN 12 1/4" HOLE

KAI FORMATION
1382.0 mMD RKB / 1382.0 mTVD RKB
(-1346.0 m MSL; TWT: 1.364 sec.)

9 5/8" casing at 1398 mMD RKB
LOT: 1.76 g/cc

CLAYSTONE: slightly silty, predominantly medium dark grey, occasionally grey black, occasionally dark green grey, blocky to amorphous, soluble, soft to firm, very glauconitic, non calcareous

TRACE SAND: loose quartz, very fine to medium



CLAYSTONE: brown black, olive grey to brown grey, green grey to dark green grey, soft to firm, occasionally moderate hard, amorphous to blocky, soluble, silty to occasionally sandy to very sandy, micromicaceous to micaceous, slightly glauconitic to very glauconitic, non calcareous

TRACE SAND: clear to translucent quartz, very fine to fine, subangular to subrounded, loose

TRACE: Glauconite

HORDALAND GROUP
BRYGGE FORMATION
1527.0 mMD RKB / 1527.0 mTVD RKB
(-1491.0 m MSL; TWT: 1.497 sec.)

CLAYSTONE: green grey to light green grey, medium dark grey, occasionally dark green grey to dusky green, trace of purple grey, olive grey, soft tc moderate hard, subblocky to blocky, occasionally silty, occasionally speckled and tuffaceous at 1575m, micromicaceous, micropyritic, slightly glauconitic to very glauconitic, non calcareous

LIMESTONE: very light grey to light grey, firm, micritic, slightly argillaceous

TRACE: Pyrite, Glauconite

ROGALAND GROUP
TARE FORMATION
1585.5 mMD RKB / 1585.5 mTVD RKB
(-1549.5 m MSL; TWT: 1.576 sec.)

CLAYSTONE: olive grey to medium dark grey, grey green, firm to moderate hard, blocky, silty, micromicaceous, pyritic to very micropyritic, occasionally slightly glauconitic, non calcareous

SAND: clear to rose smoke quartz, predominantly fine, occasionally medium to very coarse, subangular to subrounded

LIMESTONE: very light grey to light grey, firm, micritic, slightly argillaceous to argillaceous

SILTSTONE: Speckled medium to dark grey, occasionally light brown grey to brown grey, blocky, moderate hard to occasionally hard, very fine sandy to argillaceous, pyritic, non calcareous

CLAYSTONE: grey black to brown black, blocky to angular, moderate hard to hard, slightly waxy, non calcareous

TANG FORMATION
1678.0 mMD RKB / 1678.0 mTVD RKB
(-1642 m MSL; TWT: 1.636 sec.)

CLAYSTONE: varicol, med dk gry to lt gry, gn gry, brn blk, frm to mod hd, amor to blky, occ micropyr, occ micromic, occ slty/sdy, occ carbon, non to occ v calc grdg to MARL

SANDSTONE: med lt gry to med gry, clr transl qtz, v f to f, occ med to crs, mod srt, sbang to sbrndd, fri to mod hd, occ calc cmt, occ grdg into sdy LIMESTONE, occ arg, occ pyr, non to pr vis por
LIMESTONE: lt gry to med lt gry, frm to hd, occ micr, occ xln-microxln, occ sdy, occ slty arg
DOLOMITE: dk gry brn to brn blk, v hd, microxln

SHETLAND GROUP
SPRINGAR FORMATION
1700.5 mMD RKB / 1700.5 mTVD RKB
(-1664.5 m MSL; TWT: 1.652 sec.)
CLAYSTONE: med gry to med dk gry, brn gry to brn blk, gn gry, olv gry to olv blk, sft to frm, occ mod hd, amor to blky, slty to v slty, sdy
SANDSTONE: clr to transl qtz, v f to f, occ med to v crs, mod srt, sbang to sbrndd, lse, calc cmt
LIMESTONE: v lt gry to lt gry, frm to mod hd, micr to microxln, slty arg, in parts sdy

CROMER KNOLL GROUP
LYR FORMATION
1717.0 mMD RKB / 1717.0 mTVD RKB
(-1681 m MSL; TWT: 1.666 sec.)

CLAYSTONE: olive grey to olive black, brown grey, soft to firm, amorphous to subblocky, soluble, micropyritic to pyritic, silty, sandy, micromicaceous to occasionally micaceous, occasionally slightly glauconitic, occasionally carbonaceous, non to slightly calcareous

SANDSTONE: clear to translucent quartz, very fine to fine, subangular to subrounded, loose, occasionally calcite cemented, occasionally grading into sand

LIMESTONE, occasionally argillaceous, occasionally pyritic, non to poor visible porosity

TRACE: Pyrite

DOLOMITE: yellow brown to dark yellow brown, pale yellow brown, grey brown to medium dark grey, firm to very hard, occasionally microcrystalline, occasionally micritic, occasionally sucrosic, occasionally slightly calcareous

TRACE LIMESTONE: light grey to white, blocky, coarse crystalline, occasionally micritic

VIKING GROUP
MELKE FORMATION
1794 mMD RKB / 1794 mTVD RKB
(-1758.0 m MSL; TWT: 1.721 sec.)

CLAYSTONE: olive grey to olive black, brown grey, soft to firm, amorphous to subblocky, soluble, micropyritic to pyritic, silty, sandy, micromicaceos to occasionally micaceous, occasionally slightly glauconitic, occasionally carbonaceous, non to slightly calcareous

SAND: loose white to clear quartz, predominantly very fine to fine, glauconitic, pyritic

DOLOMITE: yellow brown to dark yellow brown, blocky, firm to very hard, occasionally microcrystalline, occasionally micritic, occasionally sucrosic, occasionally silty to very fine sandy

SANDSTONE: brown black to dusky yellow brown, fine, moderate to well sorted, subangular, occasionally argillaceous matrix, predominantly argillaceous, non to weak dolomite cemented, occasionally weak silica cemented, friable to loose, occasionally silty to argillaceous laminated, micromicaceous, poor to fair visible porosity, occasionally good visible porosity

SILTSTONE: grading CLAYSTONE, grey black, weak cemented, firm, laminated, micromicaceous, non calcareous

SANDSTONE: dark yellow brown to dusky yellow brown, very fine to fine, moderate to well sorted, subangular to subrounded, argillaceous matrix, friable to firm, silty, slightly dolomite cemented, micromicaceous, poor to fair visible porosity

SILTSTONE: very argillaceous grading CLAYSTONE, greyish black to dusky yellow brown, slightly to moderately dolomite cemented, soft to moderate hard, sandy, occasionally in laminaes, occasionally slightly micromicaceous, non calcareous

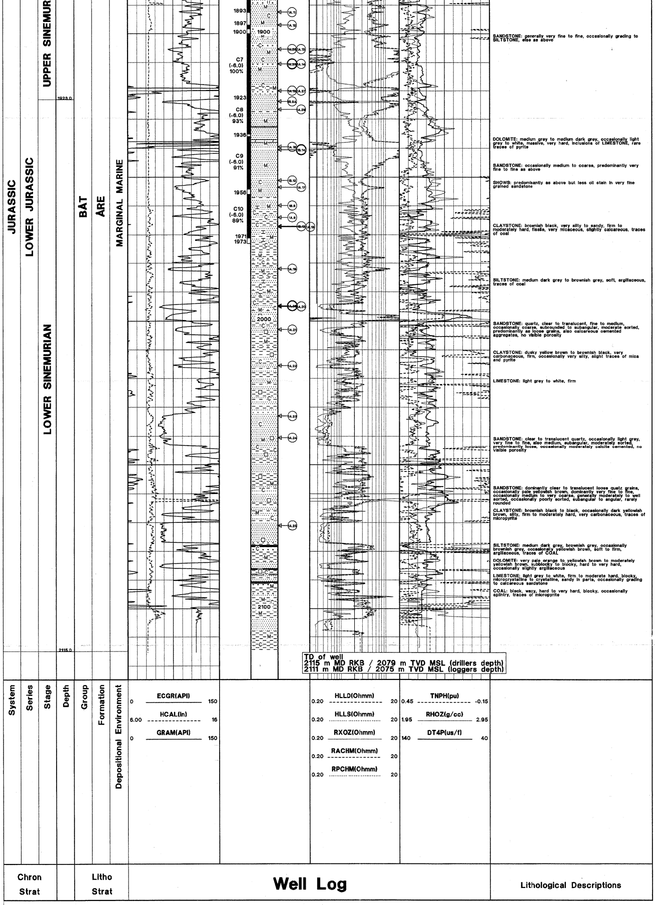
CLAYSTONE: greyish black, soft to firm, sticky, very silty, micromicaceous, slightly calcareous/dolomitic

SHOWS (from cores): good HC odour, bleeding minor oil from cores, medium brown stain, even bright yellow direct flourescence, generally fast streaming/blooming cut floorescence, less distinct shows in very fine grained sediments

FANGST GROUP / NOT FORMATION
1858.5 mMD RKB / 1858.5 mTVD RKB
(-1822.5 m MSL; TWT: 1.771 sec.)
SANDSTONE: dark yellow brown to dusky yellow brown, very fine to fine, moderate to well sorted, subangular to subrounded, argillaceous matrix, friable to firm, silty, slightly dolomite cemented, micromicaceous, poor to fair visible porosity
SILTSTONE: very argillaceous grading to CLAYSTONE, dusky yellow brown, slightly dolomite cemented, slightly micromicaceous, non calcareous

BÅT GROUP
ARE FORMATION
1873 mMD RKB / 1873 mTVD RKB
(-1837 m MSL; TWT: 1.780 sec.)

SANDSTONE: medium, occasionally coarse, else as above



SANDSTONE: generally very fine to fine, occasionally grading to SILTSTONE, else as above

DOLOMITE: medium grey to medium dark grey, occasionally light grey to white, massive, very hard, inclusions of LIMESTONE, rare traces of pyrite

SANDSTONE: occasionally medium to coarse, predominantly very fine to fine as above

SHOWS: predominantly as above but less oil stain in very fine grained sandstone

CLAYSTONE: brownish black, very silty to sandy, firm to moderately hard, fissile, very micaceous, slightly calcareous, traces of coal

SILTSTONE: medium dark grey to brownish grey, soft, argillaceous, traces of coal

SANDSTONE: quartz, clear to translucent, fine to medium, occasionally coarse, subrounded to subangular, moderate sorted, predominantly as loose grains, also calcareous cemented aggregates, no visible porosity

CLAYSTONE: dusky yellow brown to brownish black, very carbonaceous, firm, occasionally very silty, slight traces of mica and pyrite

LIMESTONE: light grey to white, firm

SANDSTONE: clear to translucent quartz, occasionally light grey, very fine to fine, also medium, subangular, moderately sorted, predominantly loose, occasionally moderately calcite cemented, no visible porosity

SANDSTONE: dominantly clear to translucent loose quatz grains, occasionally pale yellowish brown, dominantly very fine to fine, occasionally medium to very coarse, generally moderately to well sorted, occasionally poorly sorted, subangular to angular, rarely rounded

CLAYSTONE: brownish black to black, occasionally dark yellowish brown, silty, firm to moderately hard, very carbonaceous, traces of micropyrite

SILTSTONE: medium dark grey, brownish grey, occasionally brownish grey, occasionally yellowish brown, soft to firm, argillaceous, traces of COAL

DOLOMITE: very pale orange to yellowish brown to moderately yellowish brown, subblocky to blocky, hard to very hard, occasionally slightly argillaceous

LIMESTONE: light grey to white, firm to moderate hard, blocky, microcrystalline to crystalline, sandy in parts, occasionally grading to calcareous sandstone

COAL: black, waxy, hard to very hard, blocky, occasionally splintry, traces of micropyrite

MDT run 1A

Test No.	Formation	DEPTH			Hydrostatic		Formation			Mobility	Comments
		mMD	mTVD RKB	mMSL	Before BARS	After BARS	BARS	SG EMW RT	SG EMW SS	MD/CP	
1	Melke Fm.	1815	1814.9	1778.91	237.87	237.85	193.63	1.088	1.110	18.9	Good
2	Melke Fm.	1821.5	1821.4	1785.41	238.68						Probe retracted, pressure decreasing
2	Melke Fm.	1821.5	1821.4	1785.41		238.65	195,48?			26,1?	Pressure decreasing, plugging ?
3	Melke Fm.	1826.5	1826.4	1790.41	238.31	238.33	194.42	1.085	1.107	57.1	Good
4	Melke Fm.	1830.5	1830.4	1794.41	239.83	239.83	194.79	1.085	1.107	3,6?	Limited volume, pressure prob. OK
5	Melke Fm.	1838	1837.9	1801.91	240.8	240.81	195,69?				Pressure not stable
6	Melke Fm.	1838.5	1838.4	1802.41	240.83	240.86	195.25	1.083	1.104	68.8	Good
7	Melke Fm.	1843	1842.9	1806.91	241.44	241.43	195.59	1.082	1.104	4.3	Poor/Moderate
8	Åre Fm	1864	1863.9	1827.91	244.15	244.13	191.6	1.048	1.069	6	Poor/Moderate
9	Åre Fm	1880	1879.9	1843.91	246.2	246.2	192.49	1.044	1.064	313	Good
10	Åre Fm	1884.5	1884.4	1848.41	246.78	246.78	192.89	1.044	1.064	165.3	Good
11	Åre Fm	1892.5	1892.4	1856.41	247.81	247.8	193.42	1.042	1.062	10,6?	Poor
12	Åre Fm	1897	1896.9	1860.9	248.4	248.38	194.02	1.043	1.063	105,1?	Good
13	Åre Fm	1905.4	1905.3	1869.3	249.5	249.47	194.45	1.040	1.061	1062	Excellent
14	Åre Fm	1910.5	1910.4	1874.4	250.14	250.2	194.92	1.040	1.060	9469	Excellent
15	Åre Fm	1920	1919.9	1883.9	251.35	251.33	195.71	1.039	1.059	815	Excellent
16	Åre Fm	1939.5	1939.4	1903.4	253.88	253.87	197.76	1.040	1.059	1315	Excellent
17	Åre Fm	1953.5	1953.4	1917.4	256.68	255.67	199.33	1.040	1.060	3.1	Poor, not stable
18	Åre Fm	1967.3	1967.2	1931.2	257.41	257.42					Tight
19	Åre Fm	1982	1981.9	1945.9	258.32	259.3	200.68	1.032	1.051	36.7	Moderate
20	Åre Fm	1995	1994.9	1958.9	260.92	260.91	201.57	1.030	1.049	78.3	Good, lost seal on first attempt
21	Åre Fm	2003	2002.9	1966.9	261.97	261.96	202.26	1.030	1.048	642	Excellent
22	Åre Fm	2015.6	2015.5	1979.49	263.58	263.56	203.47	1.029	1.048	1723	Excellent
23	Åre Fm	2033	2032.9	1996.89	265.82	265.82	205.2	1.029	1.048	254	Good
24	Åre Fm	2040.5	2040.4	2004.39	266.79	266.8	205.95	1.029	1.048	2130	Excellent
25	Åre Fm	2071	2070.9	2034.89	270.76	270.74	208.98	1.029	1.047	1146	Excellent
26	Åre Fm	1905.4	1905.3	1869.3	249.2	249.2	194.44	1.040	1.060	585,2	Sampling, plugging/seal problem
27	Åre Fm	1920	1919.9	1883.9	251.2	251.2	195.67	1.039	1.059	26	Sampling, aborted
28	Åre Fm	1910.5	1910.4	1874.4	249.92		194.87	1.040	1.060	344	Sampling
29	Melke Fm.	1826.5	1826.4	1790.41	239.1	239.1	194.39	1.085	1.107	120	Sampling, plugging/seal problem
30	Melke Fm.	1838.5	1838.4	1802.41	240.6	240.6	195.3	1.083	1.105	69	Sampling, plugging/seal problem
31	Melke Fm.	1839.5	1839.4	1803.41	240.4	240.4	NA			NA	No seal
32	Melke Fm.	1838.2	1838.1	1802.11	240.2	240.2	NA			NA	No seal
33	Melke Fm	1839	1838.9	1802.91	240.7	240.7	NA			NA	Sampling, poor permeability
34	Melke Fm	1826	1825.9	1789.91	238.89	238.89	NA			NA	Sampling, poor permeability
35	Melke Fm	1827	1826.9	1790.91	239	239.02	194.43	1.085	1.107	NA	Sampling, high drawdown
36	Åre Fm	1994.8	1994.7	1958.7	260.8		201.69	1.031	1.050	NA	Water sample

MDT run 1B

Test No.	Formation	DEPTH			Hydrostatic		Formation			Mobility	Comments
		mMD	mTVD RKB	mMSL	Before BARS	After BARS	BARS	SG EMW RT	SG EMW SS	MD/CP	
1	Melke Fm.	1826.7	1826.6	1790.61	240.74		194.55	1.086	1.108	43.2	Pressure from prcbe
2	Melke Fm.	1826.7	1826.6	1790.61	240.94		195.90 ?	0.000	0.000		Pressure slightly increasing. Sample.
3	Åre Fm	1859.7	1859.7	1823.7	244.61		191.34 ?	0.000	0.000	1.2	Pressure still increasing
4	Åre Fm	1859.5	1859.4	1823.41	244.6			0.000	0.000		Aborted, press. still incr.
5	Åre Fm	1859.9	1859.8	1823.81	244.65		191.45	1.049	1.070		Supercharge ?
6	Åre Fm	1864	1863.9	1827.91	245.22	245.2	191.51	1.047	1.068	12.1	Good/medium
7	Åre Fm	1868	1867.9	1831.91	245.72	245.73	192.099	1.048	1.069	1	Poor
8	Åre Fm	1875	1874.9	1838.91	246.64	246.22	192.215	1.045	1.066	5	Medium
9	Åre Fm	1859.2	1859.1	1823.11	244.6	244.59	191.03	1.048	1.068	40	Good
9	Åre Fm	1923.7	1923.6	1887.6	252.97	252.96	196.03	1.039	1.059	1118	Excellent
10	Åre Fm	1940.5	1940.4	1904.4	255.16		197.9	1.040	1.059	1232	Excellent
11	Åre Fm	1953.5	1953.4	1917.4	256.86	256.88	199.02	1.039	1.058	121.6	Good
12	Åre Fm	1959.1	1959.0	1923	257.61		199.44	1.038	1.057	56.3	Good
13	Are Fm.	1967.1	1967.0	1931	258.67	258.7	199.72	1.035	1.054	51.5	Good
14	Åre Fm.	1940.5	1940.5	1904.5	255.62			0.000	0.000		Sample with dual packer.

Conventional cores

Core no.	Cored interval (m)	Recovered interval (m)	m	%	Barrel lenght (m)	Jammed	Comments
1	1827 - 1838	1827 - 1833.96	6,96	63,3	27	Yes	Melke Fm.
2	1838 - 1843	1838 - 1843	1,9	38	27	Yes	Melke Fm.
3	1843 - 1862.3	1843 - 1862.3	19.3	100	27	No	Stopped due to low penetration, Melke/Not Fm.
4	1862.3 - 1878	1862.3 - 1877.05	14.75	93.7	27	Yes	Not/ÅreFm.
5	1878 - 1897	1878 - 18932.8	14.8	77.9	27	Yes	ÅreFm.
6	1897 -1900	1897 - 1898.3	1,3	44	27	Yes	Åre Fm.
7	1900 - 1923	1900 - 1923,3	23,3	101	27	Yes	Åre Fm.
8	1923 - 1936	1923.3-1935.2	12,2	93	27	Yes	Åre Fm.
9	1936 - 1956	1935.2-1954.2	18,2	91	27	Yes	Åre Fm.
10	1956 - 1973	1956 - 1971.15	15,15	89	27	Yes	Åre Fm.

Temperatures

Log combination	Depth of measurement m MD RT	Recorded max temperature °C	Time since last circulation hrs	Evaluated temperature
HALS/PEX	2077	59,59,60	17.9	72.4°C @ 2030 m MD RT
MDT/GR	2030	63,63,65	39.8	
FMI	2084	68,68,69	107.3	
MDT/GR	1967,1	69	129,7	
VSP	2051	71,71,71	141.9	

Samples collected

No	Run	Depth m MD	Form.	Pumped volume ltr	Draw Down Bar	Fluid	Sampled	Remarks
1	1A	1910,5	Åre	100	9	Oil	1 Gallon 1 MS - 2 SF 18 Gallon	
2	1A	1994,8	Åre	approx. 70	25	Water	1 Gallon + 2 3/4 Gallon	Problems with pumping module. Tool stuck after sampling
3	1B	1826,7	Melke	252	13	Oil	1 MS + 2 SF 1 Gallon	18 Gallon sample did not open. Not pressuere on SF bottles
4	1B	1940,5	Åre	112	0	Oil	1 MS + 2 SF 1 Gallon	Problems with pumping module. Some contaminated with filtrate Contaminat