## General information

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|---|---|
| Wellbore name | 7225/3-1 |
| Type | EXPLORATION |
| Purpose | WILDCAT |
| Status | P&A |
| Press release | link to press release |
| Factmaps in new window | link to map |
| Main area | BARENTS SEA |
| Discovery | 7225/3-1 (Norvarg) |
| Well name | 7225/3-1 |
| Seismic location | inline 1438 & crossline 1874 BST4 PSTM FINAL |
| Production licence | 535 |
| Drilling operator | Total E&P Norge AS |
| Drill permit | 1350-L |
| Drilling facility | WEST PHOENIX |
| Drilling days | 149 |
| Entered date | 30.04.2011 |
| Completed date | 25.09.2011 |
| Release date | 25.09.2013 |
| Publication date | 25.09.2013 |
| Purpose - planned | WILDCAT |
| Reentry | NO |
| Content | GAS |
| Discovery wellbore | YES |
| 1st level with HC, age | MIDDLE JURASSIC |
| 1st level with HC, formation | STØ FM |
| 2nd level with HC, age | LATE TRIASSIC |
| 2nd level with HC, formation | KOBBE FM |
| 3rd level with HC, age | EARLY TRIASSIC |
| 3rd level with HC, formation | HAVERT FM |
| Kelly bushing elevation [m] | 39.0 |
| Water depth [m] | 377.0 |
| Total depth (MD) [m RKB] | 4150.0 |
| Final vertical depth (TVD) [m RKB] | 4147.0 |
| Maximum inclination [°] | 5.1 |
| Bottom hole temperature [°C] | 157 |
| Oldest penetrated age | PERMIAN |
| Oldest penetrated formation | ISBJØRN FM |

| | |
|---|---|
| Geodetic datum | ED50 |
| NS degrees | 72° 54' 58.31'' N |
| EW degrees | 25° 52' 2.67'' E |
| NS UTM [m] | 8091704.90 |
| EW UTM [m] | 462862.72 |
| UTM zone | 35 |
| NPDID wellbore | 6587 |

**Wellbore history**

**General**

Well 7225/3-1 was the first well to be drilled on the faulted Norvarg Dome on the Bjarmeland Platform in the Barents Sea. It was drilled fairly close to the crest of the structure. The primary objective was to prove hydrocarbon presence, determine fluid nature and evaluate reservoir characteristics in sandstones of the Late Triassic (Carnian) Lower Snadd Formation and the Early Triassic Kobbe Formation. Secondary objective was to prove hydrocarbons in the Jurassic Stø Formation, the Early Triassic Havert Formation, and the Permian Tempelfjorden and Bjarmeland groups.

**Operations and results**

Wildcat well 7225/3-1 was spudded with the semi-submersible installation West Phoenix on 30 April 2011 and drilled to TD at 4150 m in the Permian Isbjørn Formation. No major drilling problems were encountered, but P&A in the upper part was subject to extensive delays associated with trying to retrieve casing, failed cement plugs or leak in 20" casing and extra time spent trying to locate the source of a gas leak. The well was drilled with bentonite mud with hiv-vis pills down to 672 m, and with KCl/polymer mud from 672 m to TD.

Gas was proven both in intervals from the Jurassic and the Triassic. The Jurassic Stø Formation was gas bearing from top at 726 m to a likely GWC at 766.5 m. In the Triassic the upper part of the Snadd Formation with top at 804 m was supposed to be gas bearing, but this was not proven by sampling. The best Snadd sands, below 1040 m, could be sampled and they were water bearing. An Intra-Carnian section was penetrated from 1146 m to 1521 m. It contained gas in two zones with GWC's at 1218 m and ca 1250 m, respectively, and in a third thin sandstone from 1347 m to 1357 m. The upper and the lowermost Intra-Carnian gas zone were confirmed by MDT sampling. The Kobbe Formation was encountered at 1521 m. It is 634 m thick with 27.5% net/gross based on petrophysical evaluations. Gas was tested in numerous thin sandstone beds from 1557 m to 1779 m by MDT sampling and by a DST. The Havert Formation with top at 2554 m had only poorly developed reservoir rocks. MDT testing failed, but it was assumed to be gas bearing as well based on logs.

Rig site analyses of fluorescence (oil shows) and by GCMS analyses of up to C7 components in mud gas ("FLAIR analysis") suggested that the Stø and upper Snadd gas zones were oil-associated. The deeper gas zones were practically devoid of liquid components based on these analyses.

Four conventional cores were cut. Core 1 was cut in intra-Carnian sandstone and claystone from 1204-1258 m with 98% recovery. Core 2 was cut in the Kobbe Formation from 1675 to 1695 m with 83.3% recovery (jammed off). Core 3 was cut from 2610 to 2637 m in the Havert Formation with 100% recovery. Core 4 was cut from 4013 to 4016 m in the Isbjørn Formation with 15% recovery (jammed off). During two successful MDT wire line runs a total of 9 sampling stations were performed. Samples were taken at 1090.01 m (Snadd Formation; water+gas), 1121.98 m (Snadd Formation water), 1215.26 m (Intra-Carnian Sandstone; gas), 1279.99 m (Intra-Carnian sandstone; water), 1349.78 m (Intra-Carnian sandstone; gas), 1353.41 m (Intra-Carnian sandstone; gas), 1560.21 m (Kobbe Formation: gas), 1595.97 m (Kobbe Formation: only fluid scanning; no sample), 1778.65 m (Kobbe Formation: gas).

The well was permanently abandoned on 25 September 2011 as a gas discovery.

**Testing**

The well was perforated from 1557-1570 m,1580-1621 m and 1631 m-1685 m in the Kobbe interval.The test produced 180000 Sm3 gas/day througt a 44/64" choke. The gas gravity 0,618(air=1)

### Cuttings at the Norwegian Offshore Directorate

| Cutting sample, top depth [m] | Cutting samples, bottom depth [m] |
|---|---|
| 690.00 | 4149.00 |

| | |
|---|---|
| Cuttings available for sampling? | YES |

### Cores at the Norwegian Offshore Directorate

| Core sample number | Core sample - top depth | Core sample - bottom depth | Core sample depth - uom |
|---|---|---|---|
| 1 | 1204.0 | 1256.9 | [m ] |
| 2 | 1675.0 | 1691.7 | [m ] |
| 3 | 2610.0 | 2637.1 | [m ] |
| 4 | 4013.0 | 4013.5 | [m ] |

| | |
|---|---|
| Total core sample length [m] | 97.1 |
| Cores available for sampling? | YES |

### Lithostratigraphy

| Top depth [mMD RKB] | Lithostrat. unit |
|---|---|
| 416 | ADVENTDALEN GP |
| 416 | KOLMULE FM |
| 636 | KNURR FM |
| 670 | HEKKINGEN FM |
| 695 | FUGLEN FM |
| 727 | KAPP TOSCANA GP |
| 727 | STØ FM |
| 770 | FRUHOLMEN FM |
| 804 | SNADD FM |
| 1146 | NO FORMAL NAME |
| 1522 | SASSENDALEN GP |
| 1522 | KOBBE FM |
| 2155 | KLAPPMYSS FM |
| 2555 | HAVERT FM |
| 3666 | TEMPELFJORDEN GP |
| 3666 | ØRRET FM |
| 3771 | RØYE FM |

| | |
|---|---|
| 3931 | BJARMELAND GP |
| 3931 | ISBJØRN FM |

**Drill stem tests (DST)**

| Test number | From depth MD [m] | To depth MD [m] | Choke size [mm] |
|---|---|---|---|
| 1.0 | 1557 | 1685 | 17.5 |

| Test number | Final shut-in pressure [MPa] | Final flow pressure [MPa] | Bottom hole pressure [MPa] | Downhole temperature [°C] |
|---|---|---|---|---|
| 1.0 | | | | |

| Test number | Oil [Sm3/day] | Gas [Sm3/day] | Oil density [g/cm3] | Gas grav. rel.air | GOR [m3/m3] |
|---|---|---|---|---|---|
| 1.0 | | 180000 | | 0.618 | |

**Logs**

| Log type | Log top depth [m] | Log bottom depth [m] |
|---|---|---|
| FMI GR | 3750 | 4150 |
| FMI PPC MSIP PPC | 3390 | 4147 |
| HGNS CMR | 3750 | 4150 |
| IBC DCBL GR | 800 | 2503 |
| LEH EDTC HNGS APS TLD HRLA CMR S | 2580 | 3745 |
| LEH EDTC PPC MSIP PPC FMI | 2425 | 3753 |
| LWD - ADR SWRO GM PWD PCDC | 4016 | 4150 |
| LWD - AFR EWR DGR ALD CTN FTWD P | 677 | 1067 |
| LWD - EWR DGR PWD DI | 440 | 3750 |
| LWD - EWR P4 DGR PWD PCDC | 3751 | 4013 |
| MDT GR | 1062 | 2064 |
| MDT GR | 1594 | 1889 |
| MDT GR | 1596 | 1976 |
| MDT GR | 2605 | 2640 |
| MDT GR | 2606 | 2606 |
| MDT GR | 2606 | 3472 |
| MDT GR | 2609 | 2620 |

| | | |
|---|---|---|
| MSCT GR | 1090 | 2309 |
| MSCT GR | 1090 | 1826 |
| MSCT GR | 2605 | 3475 |
| MSIP FMI | 1062 | 2064 |
| SP CMR HRLA TLD APS HNGS | 1062 | 2064 |
| SP GPIT PPC MSIP PPC TLD APS HNG | 1062 | 2514 |
| SP HRLA TLD APS | 3750 | 4150 |
| USIT CBL GR | 395 | 1062 |
| VSP GR | 416 | 2514 |
| VSP GR | 2500 | 4143 |

**Casing and leak-off tests**

| Casing type | Casing diam. [inch] | Casing depth [m] | Hole diam. [inch] | Hole depth [m] | LOT/FIT mud eqv. [g/cm3] | Formation test type |
|---|---|---|---|---|---|---|
| CONDUCTOR | 30 | 482.0 | 36 | 484.0 | 0.00 | LOT |
| SURF.COND. | 20 | 665.0 | 26 | 672.0 | 1.50 | LOT |
| PILOT HOLE | | 681.0 | 9 7/8 | 681.0 | 0.00 | |
| INTERM. | 13 5/8 | 1062.0 | 17 1/2 | 1070.0 | 1.82 | LOT |
| INTERM. | 9 5/8 | 2503.0 | 12 1/4 | 2514.0 | 1.85 | LOT |
| LINER | 7 | 3749.0 | 8 1/2 | 3750.0 | 1.90 | LOT |
| OPEN HOLE | | 4150.0 | 6 | 4150.0 | 0.00 | LOT |

**Drilling mud**

| Depth MD [m] | Mud weight [g/cm3] | Visc. [mPa.s] | Yield point [Pa] | Mud type | Date measured |
|---|---|---|---|---|---|
| 431 | 1.30 | 10.0 | | waterbased | |
| 500 | 1.30 | 10.0 | | waterbased | |
| 502 | 1.24 | 11.0 | | ManualEntry | |
| 511 | 1.30 | 10.0 | | waterbased | |
| 540 | 1.25 | 13.0 | | waterbased | |
| 552 | 1.05 | 16.0 | | seawater | |
| 552 | 1.25 | 10.0 | | waterbased | |
| 652 | 1.30 | 10.0 | | waterbased | |
| 680 | 1.05 | 16.0 | | waterbased | |
| 854 | 1.25 | 12.0 | | waterbased | |
| 854 | 1.37 | 14.0 | | waterbased | |

| | | | | | |
|---|---|---|---|---|---|
| 957 | 1.35 | 14.0 | | waterbased | |
| 1070 | 1.25 | 17.0 | | waterbased | |
| 1730 | 1.36 | 1.0 | | brine | |
| 2014 | 1.35 | 19.0 | | waterbased | |
| 2100 | 1.45 | 24.0 | | waterbased | |
| 2514 | 1.35 | 22.0 | | waterbased | |
| 3750 | 1.52 | 22.0 | | waterbased | |
| 4150 | 1.45 | 17.0 | | waterbased | |

**Pressure plots**

The pore pressure data is sourced from well logs if no other source is specified. In some wells where pore pressure logs do not exist, information from Drill stem tests and kicks have been used. The data has been reported to the NPD, and further processed and quality controlled by IHS Markit.

| Document name | Document format | Document size [MB] |
|---|---|---|
| 6587_Formation_pressure_(Formasjonstrykk) | pdf | 0.28 |