General information

Wellbore name	15/12-10 S
Type	EXPLORATION
Purpose	APPRAISAL
Status	RE-CLASS TO DEV
Factmaps in new window	link to map
Main area	NORTH SEA
Field	VARG
Discovery	15/12-4 Varg
Well name	15/12-10
Seismic location	ST8802 SR951- INLINE 580 & CROSSLINE 948
Production licence	038
Drilling operator	Saga Petroleum ASA
Drill permit	860-L
Drilling facility	DEEPSEA BERGEN
Drilling days	34
Entered date	02.10.1996
Completed date	04.11.1996
Release date	04.11.1998
Publication date	18.01.2007
Purpose - planned	APPRAISAL
Reclassified to wellbore	15/12-A-4
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	INTRA HEATHER FM SS
Kelly bushing elevation [m]	23.0
Water depth [m]	84.0
Total depth (MD) [m RKB]	3550.0
Final vertical depth (TVD) [m RKB]	3042.0
Maximum inclination [°]	37.3
Bottom hole temperature [°C]	130
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	SKAGERRAK FM
Geodetic datum	ED50
NS degrees	58° 4' 40.48'' N
EW degrees	1° 53' 25.56'' E

NS UTM [m]	6438068.65
EW UTM [m]	434555.46
UTM zone	31
NPDID wellbore	2285

Wellbore history

General

The well is positioned on the western flank of the northern segment of the Varg Field, on a horst mapped at Top Sleipner level. Thick Intra Heather sandstones present in the southern and eastern segments of Varg were expected also in the northern segment. Over the horst, Draupne/Heather shales were assumed eroded so that Intra Heather sandstones were present between BCU and Top Sleipner. These two horizons could be mapped seismically, but the extent of sandstones could not be mapped. The well was drilled to determine the extent and thickness of the Intra Heather sandstone reservoir over the northern segment of Varg and, if oil was encountered, to determine fluid characteristics and depth to the OWC.

Operations and results

Appraisal well 15/12-10 S was drilled from the S4 slot on the Varg subsea template using the semi-submersible installation Deepsea Bergen. It was spudded on 2 October 1996 and drilled deviated to TD at 3550 m in the Triassic Skagerrak Formation. The deviation started at 250 m, building angle to 35 deg at 960 m and was then kept between 28 deg and 38 deg down to TD. No significant problems were encountered in the operations. The well was drilled with seawater down to 207 m, with seawater/PAC/CMC from 207 m to 1396 m, and with Ancovert oil based mud from 1396 m to TD. No shallow gas was predicted and no shallow gas was found in the well.

Down to Top Shetland, the well was within prognosis, and penetrated the expected lithology. Below this level, the Shetland limestone was thicker than expected, and Top Cromer Knoll and Base Cretaceous was penetrated considerably deeper than prognosed (55 and 58 metres, respectively). Below BCU, the well encountered Late Jurassic shales and siltstones, and only 13 metres TVD of poor quality Intra Heather Sandstone was penetrated at 3372 - 3388 m (2924 - 2937 m TVD MSL) in the lower part of the Late Jurassic section. This was considerably less than prognosed, and the poor reservoir quality seen in the well also proved a rapid facies variation between 15/12-6 S and -10 S, probably controlled by faulting. The Intra Heather Sandstone was oil bearing, but had poor reservoir characteristics. MDT fluid samples from the top of the unit were contaminated with oil from the oil-based drilling mud, but analyses showed that the oil was of the same type as the oil found in well 15/12-6 S. The Intra Heather Sandstone section was deeper than the anticipated OWC for this part of the field (2920 m TVD MSL), and the base of the interval represented an ODT, indicating that sandstones in this area contain oil down to a deeper level than previously assumed.

Top Sleipner and Top Triassic were penetrated close to prognosis, and a core taken in the Triassic was in parts heavily tectonized. The borehole imager (UBI) indicated faulting at the top of the Intra Heather Sandstone, and in the Sleipner formation.

One conventional core was cut from 3427 - 3448 m in the Triassic Skagerrak Formation. An MDT sampling run collected fluid in two sample chambers at 3372.15 m (2947.04 m TVD RKB).

The well was re-classed to cuttings-injector 15/12-A-4 on 4. November 1996.

Testing

No drill stem test was performed

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1400.00	3550.00

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	3427.0	3446.6	[m]

Total core sample length [m]	19.6
Cores available for sampling?	YES

Core photos


3427-3432m


3432-3437m


3437-3442m


3442-3446m

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
107	NORDLAND GP
1096	UTSIRA FM
1142	UNDIFFERENTIATED
1408	HORDALAND GP
2550	ROGALAND GP
2550	BALDER FM
2559	SELE FM
2607	LISTA FM
2766	SHETLAND GP
2766	TOR FM
2850	HOD FM
3097	BLODØKS FM
3107	SVARTE FM
3204	CROMER KNOLL GP

3204	RØDBY FM
3224	ÅSGARD FM
3261	VIKING GP
3261	HEATHER FM
3372	INTRA HEATHER FM SS
3388	HEATHER FM
3420	VESTLAND GP
3420	SLEIPNER FM
3429	NO GROUP DEFINED
3429	SKAGERRAK FM

Geochemical information

Document name	Document format	Document size [MB]
2285_1	pdf	5.24

Documents - reported by the production licence (period for duty of secrecy expired)

Document name	Document format	Document size [MB]
2285_15_12_10_S_COMPLETION_REPORT_AND_COMPLETION_LOG	pdf	27.53

Logs

Log type	Log top depth [m]	Log bottom depth [m]
DSI NGT GPIT AMS	1725	3547
MDT GR AMS	3298	3532
MDT GR AMS	3372	3383
MSCT GR	3194	3474
MSCT GR	3195	3424
MWD - GR RES DIR	107	3550
PEX AIT AMS	3164	3553
UBI NGT GPIT AMS	3164	3553
VSP MULTILOCK	1470	3540

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	203.0	36	206.0	0.00	LOT
INTERM.	13 3/8	1388.0	16	1396.0	1.60	LOT
INTERM.	9 5/8	3154.0	12 1/4	3160.0	1.53	LOT
OPEN HOLE		3550.0	8 1/2	3550.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
207	1.20	28.0		WATER BASED	
285	1.20	28.0		WATER BASED	
1396	1.20	28.0		WATER BASED	
2018	1.33	31.0		OIL BASED	
2933	1.51	35.0		OIL BASED	
3135	1.52	33.0		OIL BASED	
3160	1.53	35.0		OIL BASED	
3427	1.33	24.0		OIL BASED	
3448	1.37	23.0		OIL BASED	
3550	1.37	29.0		OIL BASED	

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]
2285_Formation_pressure_(Formasjonstrykk)	pdf	0.22