## Generell informasjon

| | |
|---|---|
| Brønnbane navn | 6608/10-12 |
| Type | EXPLORATION |
| Formål | WILDCAT |
| Status | P&A |
| Pressemelding | lenke til pressemelding |
| Faktakart i nytt vindu | lenke til kart |
| Hovedområde | NORWEGIAN SEA |
| Felt | SKULD |
| Funn | 6608/10-12 Skuld |
| Brønn navn | 6608/10-12 |
| Seismisk lokalisering | ST04M17-innline 534 & crossline 3680 |
| Utvinningstillatelse | 128 |
| Boreoperatør | StatoilHydro ASA |
| Boretillatelse | 1204-L |
| Boreinnretning | OCEAN VANGUARD |
| Boredager | 64 |
| Borestart | 19.10.2008 |
| Boreslutt | 21.12.2008 |
| Frigitt dato | 21.12.2010 |
| Publiseringsdato | 23.12.2010 |
| Opprinnelig formål | WILDCAT |
| Gjenåpnet | NO |
| Innhold | OIL |
| Funnbrønnbane | YES |
| 1. nivå med hydrokarboner, alder | EARLY CRETACEOUS |
| 1. nivå med hydrokarboner, formasjon. | LYSING FM |
| 2. nivå med hydrokarboner, alder | EARLY JURASSIC |
| 2. nivå med hydrokarboner, formasjon | ÅRE FM |
| Avstand, boredekk - midlere havflate [m] | 22.0 |
| Vanndybde ved midlere havflate [m] | 338.0 |
| Totalt målt dybde (MD) [m RKB] | 3180.0 |
| Totalt vertikalt dybde (TVD) [m RKB] | 3179.3 |
| Maks inklinasjon [°] | 3.8 |
| Temperatur ved bunn av brønnbanen [°C] | 104 |

| | |
|---|---|
| Eldste penetrerte alder | LATE TRIASSIC |
| Eldste penetrerte formasjon | RED BEDS (INFORMAL) |
| Geodetisk datum | ED50 |
| NS grader | 66° 13' 45.69'' N |
| ØV grader | 8° 18' 45.7'' E |
| NS UTM [m] | 7345831.65 |
| ØV UTM [m] | 469084.89 |
| UTM sone | 32 |
| NPDID for brønnbanen | 5949 |

**Brønnhistorie**

**General**

Well 6608/10-12 was drilled on the Dompap structure, about 17 kilometres north-northeast of the Norne field in the Norwegian Sea. The primary objective was to prove hydrocarbons in the Jurassic sandstones of the Båt group, Åre 2 and Åre 1 formations. Secondary objective in the main bore was to test for hydrocarbons in the Cretaceous Måke prospect, comprising Cretaceous Intra-Lange/Lysing Formation sandstone.

**Operations and results**

Well 6608/10-12 was spudded with the semi-submersible installation Ocean Vanguard on 19 October 2008 and drilled to TD at 3180 in the Late Triassic Red beds. No shallow gas was observed. Operations were delayed a number of times due to bad weather, but no significant operational problems were encountered. The well was drilled with spud mud down to 1415 m and with KCl/polymer/GEM GP mud from 1415 m to TD.

The well penetrated rocks of Quaternary, Tertiary, Cretaceous, Jurassic, and Triassic age. The Lysing Formation was penetrated at 2522 m to 2557 m with four meters of net oil bearing sandstone in the interval 2537 to 2542 m. No OWC was observed. Below the Lysing Formation a 42 m thick section of intra Lange Formation (middle Aptian) water bearing sandstone was encountered. Several Intra-Melke Formation sandstone units were encountered in the interval 2688 to 2738 m. These sandstones were water wet without shows. The main Åre reservoir section was encountered at 2770 m, 4 m deeper than prognosis. Oil was proven in the Åre 2 Formation. Pressure points indicated that the reservoir was oil-filled down to the base of Åre 2. No definitive OWC was observed.

Three cores were cut from 2777 to 2826.9 m in the Åre 2 Formation; a fourth core was cut from 2827 to 2845 m in the Åre 2 and Åre 1 Formation and a fifth core from 2845 to 2872 m in the Åre 1 Formation. Pressure points were taken in the Lysing Formation and in the Åre 1 and Åre 2 formations. MDT fluid samples were taken at 2539 m in the Lysing Formation (oil), at 2773 m in the Åre 2 Formation (oil), 2785.5 m in the Åre 2 Formation (oil), 2799.2 m in the Åre 2 Formation (oil), 2834.6 m in the Åre 2/1 formation boundary (water), 2836.7 m in the Åre 1 Formation (water and oil), and at 2846.9 m in the Åre 1 Formation (water). The oil / water mix sample taken at the top of Åre 1, indicate a potential transition zone. The Åre 2 sandstones was found to have a permeability range of 0.03 mD to 9000 mD with a porosity of 21 %. The numerous thin sandstone beds of the Åre 1 Formation shows a permeability range of 0.01 mD to 17000 mD with a porosity of 23 %.

Temperatures were measured on MDT but were not suitable for Horner correction. The temperature measured after the longest period without circulation, 177.5 hours, was 97 deg C, at 2875 m. This gives a gradient of 37 deg C/km from 4 deg C at seafloor.

A decision was taken to drill a sidetrack in order to find the OWC and prove enough hydrocarbon volumes for a commercial development. The well bore was plugged back and abandoned on 21 December 2008 as an oil discovery.

**Testing**

No drill stem test was performed.

## Borekaks i Sokkeldirektoratet

| Borekaksprøve, topp dybde [m] | Borekaksprøve, bunn dybde [m] |
|---|---|
| 1420.00 | 3178.00 |

| | |
|---|---|
| Borekaks tilgjengelig for prøvetaking? | YES |

### Borekjerner i Sokkeldirektoratet

| Kjerneprøve nummer | Kjerneprøve - topp dybde | Kjerneprøve - bunn dybde | Kjerneprøve dybde - enhet |
|---|---|---|---|
| 1 | 2777.0 | 2797.4 | [m ] |
| 2 | 2797.4 | 2811.8 | [m ] |
| 3 | 2812.4 | 2826.6 | [m ] |
| 4 | 2827.0 | 2845.2 | [m ] |
| 5 | 2845.2 | 2870.0 | [m ] |

| | |
|---|---|
| Total kjerneprøve lengde [m] | 92.0 |
| Kjerner tilgjengelig for prøvetaking? | YES |

### Litostratigrafi

| Topp Dyb [mMD RKB] | Litostrat. enhet |
|---|---|
| 360 | NORDLAND GP |
| 360 | NAUST FM |
| 1403 | KAI FM |
| 1565 | HORDALAND GP |
| 1565 | BRYGGE FM |
| 1772 | ROGALAND GP |
| 1772 | TARE FM |
| 1834 | TANG FM |
| 1862 | SHETLAND GP |
| 1862 | SPRINGAR FM |
| 1982 | NISE FM |
| 2348 | KVITNOS FM |
| 2534 | CROMER KNOLL GP |
| 2534 | LYSING FM |
| 2539 | LANGE FM |
| 2599 | LYR FM |
| 2674 | VIKING GP |
| 2674 | SPEKK FM |
| 2677 | MELKE FM |
| 2688 | INTRA MELKE FM SS |
| 2738 | FANGST GP |

| | |
|---|---|
| 2738 | NOT FM |
| 2770 | BÅT GP |
| 2770 | ÅRE FM |
| 3060 | GREY BEDS (INFORMAL) |
| 3133 | RED BEDS (INFORMAL) |

## Logger

| Type logg | Topp dyp for logg [m] | Bunn dyp for logg [m] |
|---|---|---|
| FMI XPT MSIP EDTC ACTS ECRD | 1650 | 3160 |
| MDT | 2785 | 2539 |
| MDT | 2834 | 2834 |
| MDT MINI DST | 2773 | 2836 |
| MDT MINI DST | 2799 | 2799 |
| MDT SAMPLE | 2846 | 2846 |
| MDT XPT GR | 2537 | 3125 |
| MWD LWD - PP ARCVRS8 GR RES PWD | 412 | 3180 |
| MWD LWD - TELE DIR | 362 | 412 |
| PEX CMR | 2499 | 2950 |
| PEX CMR HRLA ACTS ECRD EDTC ECS | 2499 | 3169 |
| VSP GR ACTS | 405 | 2945 |

## Foringsrør og formasjonsstyrketester

| Type utforing | Utforing diam. [tommer] | Utforing dybde [m] | Brønnbane diam. [tommer] | Brønnbane dyp [m] | LOT/FIT slam eqv. [g/cm3] | Type formasjonstest |
|---|---|---|---|---|---|---|
| CONDUCTOR | 30 | 408.0 | 36 | 412.0 | 0.00 | LOT |
| SURF.COND. | 13 3/8 | 1400.0 | 17 1/2 | 1415.0 | 1.57 | LOT |
| INTERM. | 9 5/8 | 2499.0 | 12 1/4 | 2500.0 | 1.96 | LOT |
| OPEN HOLE | | 3180.0 | 8 1/2 | 3180.0 | 0.00 | LOT |

## Boreslam

| Dybde MD [m] | Egenvekt, slam [g/cm3] | Viskositet, slam [mPa.s] | Flytegrense [Pa] | Type slam | Dato, måling |
|---|---|---|---|---|---|
| 1415 | 1.35 | 29.0 | | Spud Mud | |
| 1415 | 1.39 | 15.0 | | KCl/Polymer/Glycol | |

| | | | | | |
|---|---|---|---|---|---|
| 1415 | 1.35 | 29.0 | | Spud Mud | |
| 1480 | 1.45 | 15.0 | | KCl/Polymer/Glycol | |
| 1584 | 1.48 | 20.0 | | KCl/Polymer/Glycol | |
| 1760 | 1.50 | 24.0 | | KCl/Polymer/Glycol | |
| 2145 | 1.45 | 26.0 | | KCl/Polymer/GEM | |
| 2305 | 1.50 | 20.0 | | KCl/Polymer/Glycol | |
| 2430 | 1.50 | 18.0 | | KCl/Polymer/Glycol | |
| 2500 | 1.51 | 18.0 | | KCl/Polymer/Glycol | |
| 2696 | 1.35 | 19.0 | | KCl/Polymer/Glycol | |
| 2788 | 1.35 | 21.0 | | KCl/Polymer/Glycol | |
| 2796 | 1.35 | 18.0 | | KCl/Polymer/Glycol | |
| 3180 | 1.37 | 27.0 | | KCl/Polymer/GEM | |

**Trykkplott**

Porertrykksdataene kommer fra logging i brønnen hvis ingen annen kilde er oppgitt. I noen brønner der trykk ikke er logget, er det brukt informasjon fra formasjonstester eller brønnspark. Trykkdataene er rapportert inn til Oljedirektoratet og videre prosessert og kvalitetssikret av IHS Markit.

| Dokument navn | Dokument format | Dokument størrelse [KB] |
|---|---|---|
| 5949_Formation_pressure_(Formasjonstrykk) | pdf | 0.28 |