



## Generell informasjon

|                                          |                                         |
|------------------------------------------|-----------------------------------------|
| Brønnbane navn                           | 35/2-2                                  |
| Type                                     | EXPLORATION                             |
| Formål                                   | APPRAISAL                               |
| Status                                   | P&A                                     |
| Pressemelding                            | <a href="#">lenke til pressemelding</a> |
| Faktakart i nytt vindu                   | <a href="#">lenke til kart</a>          |
| Hovedområde                              | NORTH SEA                               |
| Funn                                     | <a href="#">35/2-1 (Peon)</a>           |
| Brønn navn                               | 35/2-2                                  |
| Seismisk lokalisering                    | NH06M04-inline 5004-xline 4340          |
| Utvinningstillatelse                     | <a href="#">318</a>                     |
| Boreoperatør                             | StatoilHydro Petroleum AS               |
| Boretillatelse                           | 1238-L                                  |
| Boreinnretning                           | <a href="#">TRANSOCEAN WINNER</a>       |
| Boredager                                | 55                                      |
| Borestart                                | 02.06.2009                              |
| Boreslutt                                | 26.07.2009                              |
| Frigitt dato                             | 26.07.2011                              |
| Publiseringsdato                         | 26.07.2011                              |
| Opprinnelig formål                       | APPRAISAL                               |
| Gjenåpnet                                | NO                                      |
| Innhold                                  | GAS                                     |
| Funnbrønnbane                            | NO                                      |
| 1. nivå med hydrokarboner, alder         | PLEISTOCENE                             |
| 1. nivå med hydrokarboner, formasjon.    | NAUST FM                                |
| Avstand, boredekk - midlere havflate [m] | 26.0                                    |
| Vanndybde ved midlere havflate [m]       | 372.0                                   |
| Totalt målt dybde (MD) [m RKB]           | 640.0                                   |
| Totalt vertikalt dybde (TVD) [m RKB]     | 640.0                                   |
| Maks inklinasjon [°]                     | 1.8                                     |
| Temperatur ved bunn av brønnbanen [°C]   | 15                                      |
| Eldste penetrerte alder                  | PLIOCENE                                |
| Eldste penetrerte formasjon              | NAUST FM                                |
| Geodetisk datum                          | ED50                                    |
| NS grader                                | 61° 52' 36.2" N                         |



|                      |              |
|----------------------|--------------|
| ØV grader            | 3° 24' 51" E |
| NS UTM [m]           | 6860681.03   |
| ØV UTM [m]           | 521781.52    |
| UTM sone             | 31           |
| NPDID for brønnbanen | 6084         |

## Brønnhistorie

### General

Well 35/2-2 was drilled to appraise the Peon discovery on the Tampen Spur about one block west of the Agat discovery in the northern North Sea. The objectives were to establish reservoir properties and test the hydrocarbon potential of the Peon structure, verify Sandaband as a barrier for the production wells, and test gravel pack as completion design for future production wells. Other objectives for the well were to get further information about stress in the overburden, reservoir and underburden, acquire sonic and density data from the overburden 40m over the reservoir, and collect water samples.

### Operations and results

Appraisal well 35/2-2 was spudded with the semi-submersible installation Transocean Winner on 2 June 2009 and drilled to TD at 640 m in Pliocene sediments of the Naust Formation. The seabed temperature was measured by two seabed memory gauges provided by Oceaneering. The seabed temperature oscillated between 5.8 to 6.7 deg C. An average of 6.3 deg C was taken as the seabed temperature. The well was drilled with seawater down to 429 m, with Sildril mud from 429 m to 571 m, and with Glydril Mud from 571 m to TD.

The geological model of Peon was confirmed by the well 35/2-2 and its technical sidetrack. Gas was encountered as expected from 580 down to a gas-water contact at 594 m in the Naust Formation "Peon sand". The gas is 99.98% methane with a carbon isotopic composition proving a biogenic origin. No oil shows were observed. A full set of wire line logs was acquired over the reservoir section; including sampling of a good quality water sample at 601 m. Sonic data was acquired in the overburden; however shear data is only available in the 8-1/2" section. Stress tests and extended leak-off tests were not done after careful consideration during risk assessments. Gravel pack as completion solution worked as expected. Unfortunately, Sandaband could not be pumped in the well and could therefore not be tested as a barrier

A core in the upper part of the reservoir was planned with the Full Closure Core Catcher", but not taken as the equipment did not work according to specifications.

The well was permanently abandoned on 26 July as a gas appraisal well.

### Testing

The gas reservoir was tested with a full scale DST. The test was performed from a technical sidetrack (35/2-2 T2) drilled down to 592 m, 2 m above the gas-water contact. The test produced as expected a gas rate of 1200000 Sm<sup>3</sup>/day on a 120/64" choke size. At top reservoir the formation pressure was measured to 59.7 bars at 581m TVD RKB. The temperature recorded in the DST was 11.8 deg C, but is believed to be lower than the formation temperature due to gas expansion effects. Based also on temperatures from the MDT measurements a temperature of 12.5 deg C is taken as the Formation temperature at the top of the reservoir, 581 m.



### Borekaks i Sokkeldirektoratet

|                               |                               |
|-------------------------------|-------------------------------|
| Borekaksprøve, topp dybde [m] | Borekaksprøve, bunn dybde [m] |
| 543.00                        | 640.00                        |

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

### Palynologiske preparater i Sokkeldirektoratet

| Prøve dybde | Dybde enhet | Prøve type | Laboratorie |
|-------------|-------------|------------|-------------|
| 543.0       | [m]         | DC         | FUGRO       |
| 549.0       | [m]         | DC         | FUGRO       |
| 552.0       | [m]         | DC         | FUGRO       |
| 555.0       | [m]         | DC         | FUGRO       |
| 558.0       | [m]         | DC         | FUGRO       |
| 561.0       | [m]         | DC         | FUGRO       |
| 564.0       | [m]         | DC         | FUGRO       |
| 567.0       | [m]         | DC         | FUGRO       |
| 570.0       | [m]         | DC         | FUGRO       |
| 573.0       | [m]         | DC         | FUGRO       |
| 576.0       | [m]         | DC         | FUGRO       |
| 579.0       | [m]         | DC         | FUGRO       |
| 582.0       | [m]         | DC         | FUGRO       |
| 585.0       | [m]         | DC         | FUGRO       |
| 588.0       | [m]         | DC         | FUGRO       |
| 591.0       | [m]         | DC         | FUGRO       |
| 592.0       | [m]         | DC         | FUGRO       |
| 594.0       | [m]         | DC         | FUGRO       |
| 597.0       | [m]         | DC         | FUGRO       |
| 600.0       | [m]         | DC         | FUGRO       |
| 603.0       | [m]         | DC         | FUGRO       |
| 606.0       | [m]         | DC         | FUGRO       |
| 609.0       | [m]         | DC         | FUGRO       |
| 612.0       | [m]         | DC         | FUGRO       |
| 615.0       | [m]         | DC         | FUGRO       |
| 618.0       | [m]         | DC         | FUGRO       |
| 621.0       | [m]         | DC         | FUGRO       |
| 624.0       | [m]         | DC         | FUGRO       |
| 627.0       | [m]         | DC         | FUGRO       |



|       |     |    |       |
|-------|-----|----|-------|
| 630.0 | [m] | DC | FUGRO |
| 633.0 | [m] | DC | FUGRO |
| 636.0 | [m] | DC | FUGRO |
| 639.0 | [m] | DC | FUGRO |
| 640.0 | [m] | DC | FUGRO |

Litostratigrafi

| Topp Dyb<br>[mMD RKB] | Litostrat. enhet            |
|-----------------------|-----------------------------|
| 398                   | <a href="#">NORDLAND GP</a> |
| 398                   | <a href="#">NAUST FM</a>    |

Borestrengtester (DST)

| Test nummer | Fra dybde MD<br>[m] | Til dybde MD<br>[m] | Reduksjonsven<br>til størrelse<br>[mm] |
|-------------|---------------------|---------------------|----------------------------------------|
| 1.0         | 581                 | 600                 | 48.0                                   |

| Test nummer | Endelig<br>avstengningstrykk<br>[MPa] | Endelig<br>strømningstrykk<br>[MPa] | Bunnhullstrykk<br>[MPa] | Borehullstempera<br>tur<br>[°C] |
|-------------|---------------------------------------|-------------------------------------|-------------------------|---------------------------------|
| 1.0         | 3.800                                 |                                     | 5.300                   | 12                              |

| Test nummer | Olje produksjon<br>[Sm3/dag] | Gass produksjon<br>[Sm3/dag] | Oljetetthet<br>[g/cm3] | Gasstyngde<br>rel. luft | GOR<br>[m3/m3<br>] |
|-------------|------------------------------|------------------------------|------------------------|-------------------------|--------------------|
| 1.0         |                              | 1200000                      |                        |                         |                    |

Logger

| Type logg | Topp dyp<br>for logg [m] | Bunn dyp for<br>logg [m] |
|-----------|--------------------------|--------------------------|
| ECS TLD   | 398                      | 543                      |
| EMS       | 370                      | 500                      |
| EMS       | 405                      | 568                      |
| EMS       | 405                      | 569                      |
| FMI       | 564                      | 592                      |
| FMI       | 654                      | 637                      |
| IBC       | 390                      | 418                      |



|                       |     |     |
|-----------------------|-----|-----|
| IBC CBL               | 400 | 503 |
| IBC CBL               | 400 | 539 |
| IBC CBL               | 400 | 565 |
| IBC CBL               | 445 | 542 |
| MDT                   | 581 | 607 |
| MDT                   | 601 | 602 |
| MDT                   | 601 | 601 |
| MFC-60                | 375 | 530 |
| MWD LWD - PP ARC RES9 | 429 | 640 |
| PEX                   | 443 | 568 |
| PEX                   | 564 | 592 |
| PEX HRLA              | 564 | 637 |
| PPC GPIT MSIP         | 564 | 637 |

### Foringsrør og formasjonsstyrketester

| Type utforing | Utforing<br>diam.<br>[tommer] | Utforing<br>dybde<br>[m] | Brønnbane<br>diam.<br>[tommer] | Brønnbane<br>dyp<br>[m] | LOT/FIT slam<br>eqv.<br>[g/cm3] | Type<br>formasjonstest |
|---------------|-------------------------------|--------------------------|--------------------------------|-------------------------|---------------------------------|------------------------|
| CONDUCTOR     | 30                            | 429.0                    | 36                             | 429.0                   | 0.00                            | LOT                    |
| SURF.COND.    | 13 3/8                        | 539.0                    | 17 1/2                         | 543.0                   | 1.20                            | LOT                    |
| INTERM.       | 9 5/8                         | 564.0                    | 12 1/4                         | 571.0                   | 1.22                            | LOT                    |
| OPEN HOLE     |                               | 640.0                    | 8 1/2                          | 640.0                   | 0.00                            | LOT                    |

### Boreslam

| Dybde<br>MD [m] | Egenvekt,<br>slam<br>[g/cm3] | Viskositet,<br>slam<br>[mPa.s] | Flytegrense<br>[Pa] | Type slam | Dato, måling |
|-----------------|------------------------------|--------------------------------|---------------------|-----------|--------------|
| 429             | 1.50                         | 20.0                           |                     | SILDRILL  |              |
| 543             | 1.12                         | 10.0                           |                     | SILDRILL  |              |
| 563             | 1.13                         | 19.0                           |                     | Glydril   |              |
| 571             | 1.13                         | 15.0                           |                     | Glydril   |              |
| 640             | 1.13                         | 16.0                           |                     | Glydril   |              |
| 640             | 1.13                         | 16.0                           |                     | Glydril   |              |