



## Generell informasjon

|                                          |                                  |
|------------------------------------------|----------------------------------|
| Brønnbane navn                           | 6407/9-10                        |
| Type                                     | EXPLORATION                      |
| Formål                                   | APPRAISAL                        |
| Status                                   | RE-CLASS TO DEV                  |
| Faktakart i nytt vindu                   | <a href="#">lenke til kart</a>   |
| Hovedområde                              | NORWEGIAN SEA                    |
| Felt                                     | <a href="#">DRAUGEN</a>          |
| Funn                                     | <a href="#">6407/9-1 Draugen</a> |
| Brønn navn                               | 6407/9-10                        |
| Seismisk lokalisering                    | on line 1560 and inline 2922     |
| Utvinningstillatelse                     | <a href="#">093</a>              |
| Boreoperatør                             | A/S Norske Shell                 |
| Boretillatelse                           | 1051-L                           |
| Boreinnretning                           | <a href="#">STENA DON</a>        |
| Boredager                                | 13                               |
| Borestart                                | 11.06.2003                       |
| Boreslutt                                | 23.06.2003                       |
| Frigitt dato                             | 23.06.2005                       |
| Publiseringsdato                         | 23.06.2005                       |
| Opprinnelig formål                       | APPRAISAL                        |
| Reklassifisert til brønnbane             | <a href="#">6407/9-F-1 H</a>     |
| Gjenåpnet                                | NO                               |
| Innhold                                  | OIL                              |
| Funnbrønnbane                            | NO                               |
| 1. nivå med hydrokarboner, alder         | LATE JURASSIC                    |
| 1. nivå med hydrokarboner, formasjon.    | ROGN FM                          |
| 2. nivå med hydrokarboner, alder         | MIDDLE JURASSIC                  |
| 2. nivå med hydrokarboner, formasjon     | GARN FM                          |
| Avstand, boredekk - midlere havflate [m] | 24.0                             |
| Vanndybde ved midlere havflate [m]       | 250.0                            |
| Totalt målt dybde (MD) [m RKB]           | 1800.0                           |
| Totalt vertikalt dybde (TVD) [m RKB]     | 1800.0                           |
| Maks inklinasjon [°]                     | 0.8                              |
| Eldste penetrerte alder                  | MIDDLE JURASSIC                  |
| Eldste penetrerte formasjon              | NOT FM                           |



|                      |               |
|----------------------|---------------|
| Geodetisk datum      | ED50          |
| NS grader            | 64° 22' 32" N |
| ØV grader            | 7° 46' 9.2" E |
| NS UTM [m]           | 7139616.70    |
| ØV UTM [m]           | 440609.12     |
| UTM sone             | 32            |
| NPDID for brønnbanen | 4710          |

## Brønnhistorie

### General

Well 6407/9-10 is located on the Draugen Field. The primary objective of the well was to appraise the Garn Formation in the "Garn Central North" area, with respect to saturation (oil, water) and to prove up reserves. The secondary objective was to obtain the residual water saturation in the Rogn Formation. Results would be used in deciding the size and scope of the Draugen infill-drilling program, and to provide necessary insight into the performance of the water flood in the Rogn Formation.

### Operations and results

Appraisal well 6407/9-10 was spudded with the semi-submersible installation Stena Don on 11 June 2003 and drilled to TD at 1800 m in the Middle Jurassic Not Formation. The well was drilled without significant technical problems and within time schedule. The well was drilled with seawater down to 348 m, with KCl/polymer mud from 348 m to 1013 m, and with silicate (SilDrill) mud from 1013 m to TD.

Correlation of the wire line logs from this well with the data from the nearby wells 6407/9-1 and 6407/9-A-2, showed that the Rogn Formation is of equally good reservoir quality at the 6407/9-10 location. The Garn formation, however, compared with well 6407/9-A-2 and 6407/9-4, had poorer reservoir quality than expected. High quality rock and fluids data were obtained with 3 successful wire line logging runs. The results showed that the Garn formation was 13.5 m deeper than prognosis, which is below the original oil water contact. The net original oil column in the Rogn formation was found to be 5 metres thicker than prognosis. The top three meters were unswept while the remaining section of the Rogn was swept with an average remaining hydrocarbon saturation of 19% at present. The MDT tests showed that the Rogn formation was at 158 bar, which is 7 bar lower than the original reservoir pressure. This is still at least 100 bar above the bubble point pressure. In the Garn 4 there is a 1 bar draw-down when compared to the original Garn pressure while Garn 3 is at original pressure. Fluid samples were taken in the Garn Formation (1706 m and 1669 m) and in the centre of the Rogn Formation (1650 m). None of these samples contained hydrocarbons and were all shown to be original formation water rather than injected seawater. The only rock samples collected were ditch cuttings from the 8 1/2" hole section. No core or sidewall core samples were taken.

The well was permanently abandoned on 23 June 2003 as an oil appraisal well.

### Testing

No drill stem test was performed.



### Litostratigrafi

| Topp Dyb<br>[mMD RKB] | Litostrat. enhet                |
|-----------------------|---------------------------------|
| 294                   | <a href="#">NORDLAND GP</a>     |
| 294                   | <a href="#">NAUST FM</a>        |
| 797                   | <a href="#">KAI FM</a>          |
| 878                   | <a href="#">HORDALAND GP</a>    |
| 878                   | <a href="#">BRYGGE FM</a>       |
| 1385                  | <a href="#">ROGALAND GP</a>     |
| 1385                  | <a href="#">TARE FM</a>         |
| 1445                  | <a href="#">TANG FM</a>         |
| 1555                  | <a href="#">SHETLAND GP</a>     |
| 1579                  | <a href="#">CROMER KNOLL GP</a> |
| 1608                  | <a href="#">VIKING GP</a>       |
| 1608                  | <a href="#">SPEKK FM</a>        |
| 1635                  | <a href="#">ROGN FM</a>         |
| 1665                  | <a href="#">FANGST GP</a>       |
| 1665                  | <a href="#">GARN FM</a>         |
| 1766                  | <a href="#">NOT FM</a>          |

### Spleisede logger

| Dokument navn                  | Dokument<br>format | Dokument<br>størrelse [KB] |
|--------------------------------|--------------------|----------------------------|
| <a href="#">4710_6407_9_10</a> | pdf                | 0.26                       |

### Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

| Dokument navn                                    | Dokument<br>format | Dokument<br>størrelse [KB] |
|--------------------------------------------------|--------------------|----------------------------|
| <a href="#">4710_6407_9_10_COMPLETION_LOG</a>    | .pdf               | 0.39                       |
| <a href="#">4710_6407_9_10_COMPLETION_REPORT</a> | .PDF               | 8.58                       |

### Logger

| Type logg | Topp dyp<br>for logg [m] | Bunn dyp for<br>logg [m] |
|-----------|--------------------------|--------------------------|
| CMR GR    | 0                        | 0                        |





|                        |      |      |
|------------------------|------|------|
| MDT GR                 | 1636 | 1739 |
| MWD LWD - GR RES V675R | 273  | 1800 |
| PEX DSI EMS ACTS       | 1000 | 1800 |

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                      | 358.0              | 36                       | 359.0             | 0.00                      | LOT                 |
| CONDUCTOR     | 20                      | 363.0              | 26                       | 363.0             | 0.00                      | LOT                 |
| SURF.COND.    | 9 5/8                   | 1008.0             | 12 1/4                   | 1020.0            | 0.00                      | LOT                 |
| OPEN HOLE     |                         | 1800.0             | 8 1/2                    | 1800.0            | 0.00                      | LOT                 |

Boreslam

| Dybde MD [m] | Egenvekt, slam [g/cm3] | Viskositet, slam [mPa.s] | Flytegrense [Pa] | Type slam | Dato, måling |
|--------------|------------------------|--------------------------|------------------|-----------|--------------|
| 274          | 1.03                   |                          |                  | DUMMY     |              |
| 360          | 1.03                   |                          |                  | DUMMY     |              |
| 916          | 1.03                   |                          |                  | DUMMY     |              |
| 1020         | 1.25                   | 18.0                     |                  | SPUD MUD  |              |

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] |
|-----------------------------------------------------------|-----------------|-------------------------|
| <a href="#">4710 Formation pressure (Formasjonstrykk)</a> | PDF             | 0.22                    |

