



## Generell informasjon

|                                          |                                     |
|------------------------------------------|-------------------------------------|
| Brønnbane navn                           | 2/7-27 S                            |
| Type                                     | EXPLORATION                         |
| Formål                                   | APPRAISAL                           |
| Status                                   | RE-CLASS TO DEV                     |
| Faktakart i nytt vindu                   | <a href="#">lenke til kart</a>      |
| Hovedområde                              | NORTH SEA                           |
| Felt                                     | <a href="#">EMBLA</a>               |
| Funn                                     | <a href="#">2/7-20 Embla</a>        |
| Brønn navn                               | 2/7-27                              |
| Seismisk lokalisering                    | LINJE PC-297 KRYSSN.PKT. TRASE 1143 |
| Utvinningstillatelse                     | <a href="#">018</a>                 |
| Boreoperatør                             | Phillips Petroleum Company Norway   |
| Boretillatelse                           | 707-L                               |
| Boreinnretning                           | <a href="#">WEST DELTA</a>          |
| Boredager                                | 222                                 |
| Borestart                                | 09.11.1991                          |
| Boreslutt                                | 17.06.1992                          |
| Frigitt dato                             | 17.06.1994                          |
| Publiseringsdato                         | 05.12.2012                          |
| Opprinnelig formål                       | APPRAISAL                           |
| Reklassifisert til brønnbane             | <a href="#">2/7-D-27</a>            |
| Gjenåpnet                                | NO                                  |
| Innhold                                  | OIL                                 |
| Funnbrønnbane                            | NO                                  |
| 1. nivå med hydrokarboner, alder         | DEVONIAN                            |
| 1. nivå med hydrokarboner, formasjon.    | NO GROUP DEFINED                    |
| Avstand, boredekk - midlere havflate [m] | 29.0                                |
| Vanndybde ved midlere havflate [m]       | 71.0                                |
| Totalt målt dybde (MD) [m RKB]           | 4801.0                              |
| Totalt vertikalt dybde (TVD) [m RKB]     | 4452.0                              |
| Maks inklinasjon [°]                     | 41.8                                |
| Temperatur ved bunn av brønnbanen [°C]   | 168                                 |
| Eldste penetrerte alder                  | DEVONIAN                            |
| Eldste penetrerte formasjon              | NO GROUP DEFINED                    |
| Geodetisk datum                          | ED50                                |



|                      |                  |
|----------------------|------------------|
| NS grader            | 56° 19' 59.81" N |
| ØV grader            | 3° 14' 53.77" E  |
| NS UTM [m]           | 6243340.01       |
| ØV UTM [m]           | 515351.24        |
| UTM sone             | 31               |
| NPDID for brønnbanen | 1878             |

## Brønnhistorie

**General**

Well 2/7-27 S was drilled on the Embla structure in the southern North Sea. The objective was to drill to replace the abandoned 2/7-23 S well as a production well in the Embla reservoir. Well 2/7-27 S would thus be drilled as close as possible to the 2/7-23 S well path and to the same bottom hole location. By this it was anticipated that the extensive core data recovered in the 2/7-23 S would be applicable to the production data to be gained from the 2/7-27 S. The 2/7-23 S had earlier confirmed the presence of hydrocarbon bearing sandstones originally discovered in the 2/7-9 (1974), and later tested in the 2/7-20 (1988) and 2/7-21 S (1989) wells, but was abandoned before well testing could be performed.

**Operations and results**

Appraisal well 2/7-27 S was spudded with the semi-submersible installation West Delta on 9 November 1991 and drilled to TD at 4801 m (4452 m TVD) in pre-Jurassic rocks. It was drilled deviated from a fifteen slot production template located at the site of the planned Embla production facilities. Drilling problems with stuck pipe were encountered in the 12 1/4" hole section at 3470 m, forcing a technical sidetrack from 2972.7 m. Unlike previous Embla wells, the 2/7-27S was drilled using water based mud throughout. It was drilled with seawater and hi-vis pills down to 573 m, with KCl/polymer mud from 573 m to 3791 m, with Baranex-Thermathin mud from 3791 m to 4500 m, and with a Thermadrill/Baranex high temperature mud system from 4500 m to TD.

The 2/7-27 S well encountered top Mandal Formation at 4476 m and top pre-Jurassic reservoir at 4483.3 m (4177.6 m TVD) with the same reservoir stratigraphy as the 2/7-23S. However, although the wells are only 46.5 m apart at the Base Cretaceous Unconformity, this surface was penetrated 28 m TVD deeper in the 2/7-27 S. Log correlation and seismic interpretation suggest the presence of a fault between (in the vicinity of) the two wells, but the evidence is incomplete. The pre-Jurassic reservoir was hydrocarbon bearing as in well 2/7-23 S.

One core was cut in each of the Ekofisk and Tor Formation and two consecutive cores were cut in the pre-Jurassic reservoir section. A segregated RFT sample was taken at 4488.5 m. It contained 100% mud filtrate.

The well was suspended suitable for later re-entry and tie back as a production well. The well was completed on 17 June 1992. On 2 March 1993 it was re-entered and re-classified to development well.

**Testing**

A single DST test where performed over the pre-Jurassic reservoir from 4483.6 - 4740.9 m (4177.9 - 4399.5 m TVD). At the end of the main flow the well produced 582 Sm<sup>3</sup> oil and 180400 Sm<sup>3</sup> gas /day through a 20/64" choke. The GOR was 309 Sm<sup>3</sup>/Sm<sup>3</sup> and the oil gravity was 45 deg API. The H<sub>2</sub>S content was 25 up to ppm (peak) and the CO<sub>2</sub> content was 6%. With a 40/64" choke the GOR was 265 Sm<sup>3</sup>/Sm<sup>3</sup>. The maximum bottom hole temperature recorded in the main flow by the HRS Gauge at 4142.2 m (3894.9 m TVD) was 160 deg C.



|                               |                               |
|-------------------------------|-------------------------------|
| Borekaksprøve, topp dybde [m] | Borekaksprøve, bunn dybde [m] |
| 3855.50                       | 4800.60                       |

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

### Borekjerne i Sokkeldirektoratet

| Kjerneprøve nummer | Kjerneprøve - topp dybde | Kjerneprøve - bunn dybde | Kjerneprøve dybde - enhet |
|--------------------|--------------------------|--------------------------|---------------------------|
| 1                  | 10410.0                  | 10462.0                  | [ft ]                     |
| 2                  | 10715.0                  | 10745.0                  | [ft ]                     |
| 3                  | 15039.0                  | 15056.0                  | [ft ]                     |
| 4                  | 15056.0                  | 15075.6                  | [ft ]                     |

|                                       |      |
|---------------------------------------|------|
| Total kjerneprøve lengde [m]          | 36.1 |
| Kjerner tilgjengelig for prøvetaking? | YES  |

### Kjernebilder



10410-10425ft



10425-10440ft



10440-10455ft



10455-10462ft



10715-10730ft



10730-10745ft



15039-15054ft



15054-15056ft



15056-15071ft



15071-15075ft

### Oljeprøver i Sokkeldirektoratet

| Test type | Flaske nummer | Topp dyp MD [m] | Bunn dyp MD [m] | Væske type | Test tidspunkt     | Prøver tilgjengelig |
|-----------|---------------|-----------------|-----------------|------------|--------------------|---------------------|
| DST       | DST1          | 4484.80         | 4742.10         |            | 01.06.1992 - 00:00 | YES                 |



### Litostratigrafi

| Topp Dyb<br>[mMD RKB] | Litostrat. enhet                |
|-----------------------|---------------------------------|
| 100                   | <a href="#">NORDLAND GP</a>     |
| 1600                  | <a href="#">HORDALAND GP</a>    |
| 3007                  | <a href="#">ROGALAND GP</a>     |
| 3007                  | <a href="#">BALDER FM</a>       |
| 3027                  | <a href="#">SELE FM</a>         |
| 3083                  | <a href="#">LISTA FM</a>        |
| 3140                  | <a href="#">VÅLE FM</a>         |
| 3167                  | <a href="#">SHETLAND GP</a>     |
| 3167                  | <a href="#">EKOFISK FM</a>      |
| 3255                  | <a href="#">TOR FM</a>          |
| 3523                  | <a href="#">HOD FM</a>          |
| 4161                  | <a href="#">BLODØKS FM</a>      |
| 4170                  | <a href="#">HIDRA FM</a>        |
| 4238                  | <a href="#">CROMER KNOLL GP</a> |
| 4238                  | <a href="#">RØDBY FM</a>        |
| 4287                  | <a href="#">SOLA FM</a>         |
| 4333                  | <a href="#">TUXEN FM</a>        |
| 4362                  | <a href="#">ÅSGARD FM</a>       |
| 4476                  | <a href="#">TYNE GP</a>         |
| 4483                  | <a href="#">UNDEFINED GP</a>    |

### Geokjemisk informasjon

| Dokument navn              | Dokument format | Dokument størrelse [KB] |
|----------------------------|-----------------|-------------------------|
| <a href="#">1878_GCH_1</a> | pdf             | 1.60                    |
| <a href="#">1878_GCH_2</a> | pdf             | 5.95                    |
| <a href="#">1878_GCH_3</a> | pdf             | 1.08                    |
| <a href="#">1878_GCH_4</a> | pdf             | 1.71                    |

### Dokumenter - eldre Søkeldirektoratets WDSS rapporter og andre relaterte dokumenter





| Dokument navn                                    | Dokument format | Dokument størrelse [KB] |
|--------------------------------------------------|-----------------|-------------------------|
| <a href="#">1878 01 WDSS General Information</a> | pdf             | 0.65                    |
| <a href="#">1878 02 WDSS completion log</a>      | pdf             | 0.23                    |

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

| Dokument navn                                             | Dokument format | Dokument størrelse [KB] |
|-----------------------------------------------------------|-----------------|-------------------------|
| <a href="#">1878 2 7 27 S COMPLETION LOG</a>              | pdf             | 2.67                    |
| <a href="#">1878 2 7 27 S Completion report</a>           | pdf             | 51.20                   |
| <a href="#">1878 2 7 27 S Completion report Drilling</a>  | pdf             | 60.60                   |
| <a href="#">1878 2 7 27 S Completion report Enclosure</a> | pdf             | 18.11                   |

### Borestrengtester (DST)

| Test nummer | Fra dybde MD [m] | Til dybde MD [m] | Reduksjonsventil størrelse [mm] |
|-------------|------------------|------------------|---------------------------------|
| 1.0         | 4741             | 4484             | 7.9                             |

| Test nummer | Endelig avstengningstrykk [MPa] | Endelig strømningstrykk [MPa] | Bunnhullstrykk [MPa] | Borehullstemperatur [°C] |
|-------------|---------------------------------|-------------------------------|----------------------|--------------------------|
| 1.0         |                                 |                               |                      |                          |

| Test nummer | Olje produksjon [Sm3/dag] | Gass produksjon [Sm3/dag] | Oljetetthet [g/cm3] | Gasstyngde rel. luft | GOR [m3/m3] |
|-------------|---------------------------|---------------------------|---------------------|----------------------|-------------|
| 1.0         | 582                       | 180400                    | 0.800               | 0.800                | 309         |

### Logger

| Type logg      | Topp dyp for logg [m] | Bunn dyp for logg [m] |
|----------------|-----------------------|-----------------------|
| BGL GR         | 3074                  | 4261                  |
| CBL VDL GR CCL | 93                    | 1910                  |
| CBL VDL GR CCL | 1984                  | 3039                  |
| CBL VDL GR CCL | 4182                  | 4678                  |
| DIL MSFLGR     | 4288                  | 4799                  |







|                 |      |      |
|-----------------|------|------|
| DLL MSFL BHC GR | 2137 | 3166 |
| DLL MSFL BHC GR | 3074 | 4297 |
| FMS GR          | 0    | 0    |
| LDL CNL GR      | 2137 | 3109 |
| LDL CNL GR      | 4473 | 4807 |
| MWD- GR RES DIR | 550  | 4785 |
| RFT GR          | 0    | 0    |
| SDT NGT         | 4466 | 4803 |

**Foringsrør og formasjonsstyrketester**

| Type utforing | Utforing diam.<br>[tommer] | Utforing dybde<br>[m] | Brønnbane diam.<br>[tommer] | Brønnbane dyp<br>[m] | LOT/FIT slam<br>eqv.<br>[g/cm3] | Type formasjonstest |
|---------------|----------------------------|-----------------------|-----------------------------|----------------------|---------------------------------|---------------------|
| CONDUCTOR     | 30                         | 156.0                 | 36                          | 157.0                | 0.00                            | LOT                 |
| INTERM.       | 20                         | 570.0                 | 26                          | 572.0                | 1.92                            | LOT                 |
| INTERM.       | 13 3/8                     | 2139.0                | 17 1/2                      | 2140.0               | 2.00                            | LOT                 |
| INTERM.       | 9 7/8                      | 4285.0                | 12 1/4                      | 4286.0               | 1.80                            | LOT                 |
| LINER         | 7                          | 4797.0                | 8 1/2                       | 4800.0               | 2.18                            | LOT                 |

**Boreslam**

| Dybde MD [m] | Egenvekt, slam<br>[g/cm3] | Viskositet, slam<br>[mPa.s] | Flytegrense [Pa] | Type slam   | Dato, måling |
|--------------|---------------------------|-----------------------------|------------------|-------------|--------------|
| 160          | 1.43                      |                             |                  | WATER BASED |              |
| 570          | 1.04                      |                             |                  | WATER BASED |              |
| 573          | 1.04                      |                             |                  | WATER BASED |              |
| 579          | 1.56                      | 13.0                        |                  | WATER BASED |              |
| 1033         | 1.33                      | 24.0                        |                  | OIL BASED   |              |
| 1919         | 1.76                      | 20.0                        |                  | WATER BASED |              |
| 1979         | 1.87                      | 26.0                        |                  | WATER BASED |              |
| 2827         | 1.87                      | 52.0                        |                  | WATER BASED |              |
| 2839         | 1.87                      | 53.0                        |                  | WATER BASED |              |
| 2843         | 1.87                      | 43.0                        |                  | WATER BASED |              |
| 3008         | 1.87                      | 47.0                        |                  | WATER BASED |              |
| 3040         | 1.87                      | 20.0                        |                  | WATER BASED |              |
| 3078         | 1.73                      | 26.0                        |                  | WATER BASED |              |
| 3146         | 1.74                      | 27.0                        |                  | WATER BASED |              |
| 3164         | 1.71                      | 24.0                        |                  | WATER BASED |              |
| 3170         | 1.87                      | 42.0                        |                  | WATER BASED |              |



## Faktasider

### Brønnbane / Leting

Utskriftstidspunkt: 12.5.2024 - 13:32

|      |      |      |  |             |  |
|------|------|------|--|-------------|--|
| 3194 | 1.71 | 29.0 |  | WATER BASED |  |
| 3200 | 1.87 | 44.0 |  | WATER BASED |  |
| 3229 | 1.75 | 39.0 |  | WATER BASED |  |
| 3296 | 1.87 | 30.0 |  | WATER BASED |  |
| 3375 | 1.59 | 30.0 |  | WATER BASED |  |
| 3375 | 1.59 | 30.0 |  | WATER BASED |  |
| 3375 | 1.59 | 29.0 |  | WATER BASED |  |
| 3375 | 1.59 | 30.0 |  | WATER BASED |  |
| 3375 | 1.59 | 30.0 |  | WATER BASED |  |
| 3391 | 1.87 | 34.0 |  | WATER BASED |  |
| 3439 | 1.87 | 34.0 |  | WATER BASED |  |
| 3447 | 1.87 | 32.0 |  | WATER BASED |  |
| 3471 | 1.86 | 29.0 |  | WATER BASED |  |
| 3473 | 1.57 | 33.0 |  | WATER BASED |  |
| 3536 | 1.56 | 35.0 |  | WATER BASED |  |
| 3675 | 1.56 | 35.0 |  | WATER BASED |  |
| 3682 | 1.75 | 26.0 |  | WATER BASED |  |
| 3890 | 1.58 | 35.0 |  | WATER BASED |  |
| 3930 | 1.58 | 10.0 |  | WATER BASED |  |
| 3995 | 1.62 | 22.0 |  | WATER BASED |  |
| 4002 | 1.63 | 23.0 |  | WATER BASED |  |
| 4008 | 1.71 | 29.0 |  | WATER BASED |  |
| 4014 | 2.10 | 32.0 |  | WATER BASED |  |
| 4039 | 1.75 | 29.0 |  | WATER BASED |  |
| 4106 | 1.68 | 25.0 |  | WATER BASED |  |
| 4134 | 1.68 | 32.0 |  | WATER BASED |  |
| 4168 | 1.68 | 29.0 |  | WATER BASED |  |
| 4171 | 1.68 | 27.0 |  | WATER BASED |  |
| 4243 | 1.68 | 24.0 |  | WATER BASED |  |
| 4255 | 2.10 | 21.0 |  | WATER BASED |  |
| 4287 | 1.75 | 24.0 |  | WATER BASED |  |
| 4300 | 1.75 | 22.0 |  | WATER BASED |  |
| 4323 | 2.04 | 29.0 |  | WATER BASED |  |
| 4415 | 2.06 | 25.0 |  | WATER BASED |  |
| 4500 | 2.06 | 23.0 |  | WATER BASED |  |
| 4505 | 2.06 | 23.0 |  | WATER BASED |  |
| 4539 | 2.06 | 20.0 |  | WATER BASED |  |
| 4562 | 2.10 | 25.0 |  | WATER BASED |  |
| 4589 | 2.10 | 28.0 |  | WATER BASED |  |
| 4668 | 2.10 | 30.0 |  | WATER BASED |  |



|      |      |      |  |             |  |
|------|------|------|--|-------------|--|
| 4775 | 2.10 | 31.0 |  | WATER BASED |  |
| 4776 | 2.06 | 26.0 |  | WATER BASED |  |
| 4801 | 2.06 | 26.0 |  | WATER BASED |  |
| 4801 | 2.06 | 27.0 |  | OIL BASED   |  |