



# PL930 License Surrender Report

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## 1 License history

**License:** PL930

**Location:** Blocks 35/6

**Awarded:** 02.03.2018 (APA 2018 application)

**License period:** Expires 02.03.2025

**License group:** Equinor Energy AS 40% (Operator)  
 Wellesley Petroleum AS 20%  
 Spirit Energy Norge AS 20%  
 Vår Energy AS 20%

**License area:** 243,128 km<sup>2</sup>

**Work obligations:**

- Acquire and/or reprocess 3D seismic.
- Drill or drop decision exp date: 02.03.2020.

**Meetings held:**

11.04.2018	EC/MC startup meeting
22.05.2018	EC work meeting
06.11.2018	EC/MC meeting
24.04.2019	EC work meeting
25.11.2019	EC/MC meeting

**Work performed:**

2018:	License start-up.
2018/2019:	Purchased CGG broadband 3D seismic, part of the license Common Database. Evaluation of all prospective levels in license. AVO work on all prospective levels.
2019:	Decision made to surrender the license.

**Reason for surrender**

Work obligations in PL930 was to acquire and reprocess 3D seismic. The new, high quality multicient broadband seismic survey CGG17M01 (PSTM) and the reprocessed survey CGG17M0\_WPR17 are covering the area.

The prospects Mash and Rio are pure stratigraphic pinch-out traps. These prospects are of Lower Cretaceous age in the Agat Formation. It is not possible to stack prospects and test several with one well.

Extensive seismic mapping and prospect evaluation has been conducted focusing mainly on the Lower Cretaceous play, including AVO analysis, biostratigraphy and petrography to try to reduce the high prospect risks. However, the updated evaluation of the PL930 prospectivity shows that for the main prospects Mash and Rio, the final volumes and risks appear insufficient to recommend this as a drilling candidate. Assessment and maturation of potential in the overburden also gives volumes and risks that are insufficient. Based on this, the partnership do not see any attractive drilling candidate in PL930 and have decided to drop the license.

## 2 Database overviews

### 2.1 Geophysical data

Survey name	Type	Company responsible	Year	NPDID for survey	Market available
CGG17M01	3D	CGG	2017	8128 and 8179	N
CGG17M0_WPR17	3D	Wellesley Petroleum	2017		N

Table 1: List of seismic surveys in the license common database (see also Figure 1).

- CGG17M01 Final seamless Horda survey PSTM inside PL930 common database area.
- CGG17M0\_WPR17 inside PL930 common database area.

### 2.2 Well data

Released wells (older than 20 years)					
Well bore	Age at TD	Drilling operator	Content	TD TVD[mRKB]	Comp. year
35/3-1	Middle Jurassic	Saga Petroleum ASA	Dry	4469.6	1976
35/3-2	Pre-Devonian	Saga Petroleum ASA	Gas/Cond	4396.0	1980
35/3-4	Pre-Devonian	Saga Petroleum ASA	Gas/Cond	4087.0	1980
35/3-5	Pre-Devonian	Saga Petroleum ASA	Dry	4112.0	1982
35/4-1	Triassic	Norsk Hydro	Shows	4924.0	1997
35/9-1	Pre-Devonian	Norsk Hydro	Oil/Gas	2348.0	1989
35/9-2	Pre-Devonian	Norsk Hydro	Oil/Gas	2877.0	1991
35/9-3 T2	Pre-Devonian	Norsk Hydro	Oil/Gas	2781.0	1997
36/1-2	Pre-Devonian	Saga Petroleum ASA	Shows	3250.0	1975
36/4-1	Pre-Devonian	BP	Dry	2715.0	1996
36/7-2	Pre-Devonian	Norsk Hydro	Oil	1435.0	1997

#### Not released

Well bore	Age at TD	Drilling operator	Content	TD TVD[mRKB]	Comp. year
35/2-3	Late Cretaceous	Statoil	Dry	1640	2012
35/6-2 S	Early Cretaceous/Jurassic?	Statoil	Dry	3583.2	2009
36/7-4	Lower Cretaceous	Engie E&P Norge AS	Oil/Gas	2702.0	2016
36/7-3	Middle Jurassic	Norsk Hydro	Dry	2946.8	2002
35/3-6	Late Jurassic	RWE Dea Norge AS	Dry	3366.0	2002
35/3-7 S	Middle Jurassic	VNG Norge AS	Gas	3971.0	2009
35/9-5	Middle Jurassic	Nexen Exploration Norge AS	Dry	3529.0	2010
35/9-9	Triassic	GDF SUEZ E&P Norge AS	Dry	3338.0	2013
To be traded					
Well bore	Age at TD	Drilling operator	Content	TD TVD[mRKB]	Comp. year
35/9-14	Middle Jurassic	Spirit Energy Norge AS	Oil	3657.0	2018

Table 2: List of wellbores in the common license database (see also Figure 1).

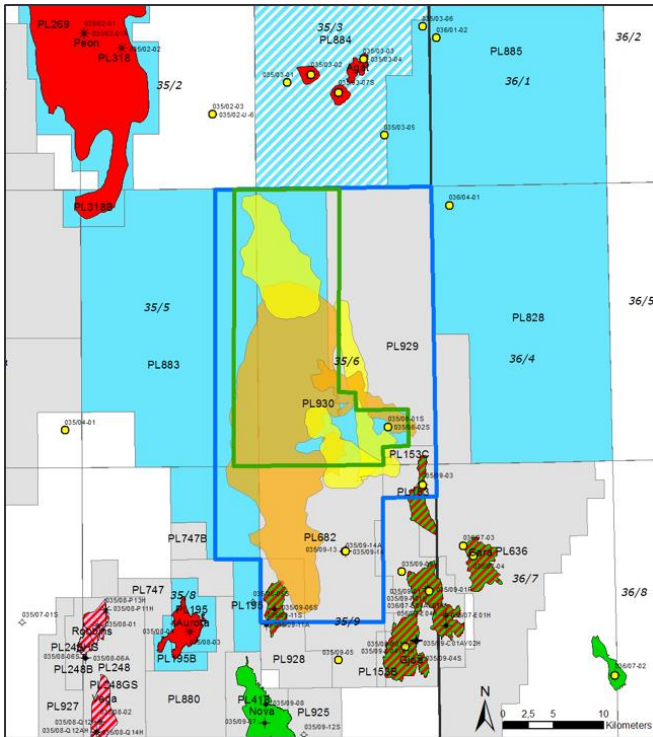


Figure 1: Seismic and well database. The blue line marks the seismic common database area, and the green line the license boundary.

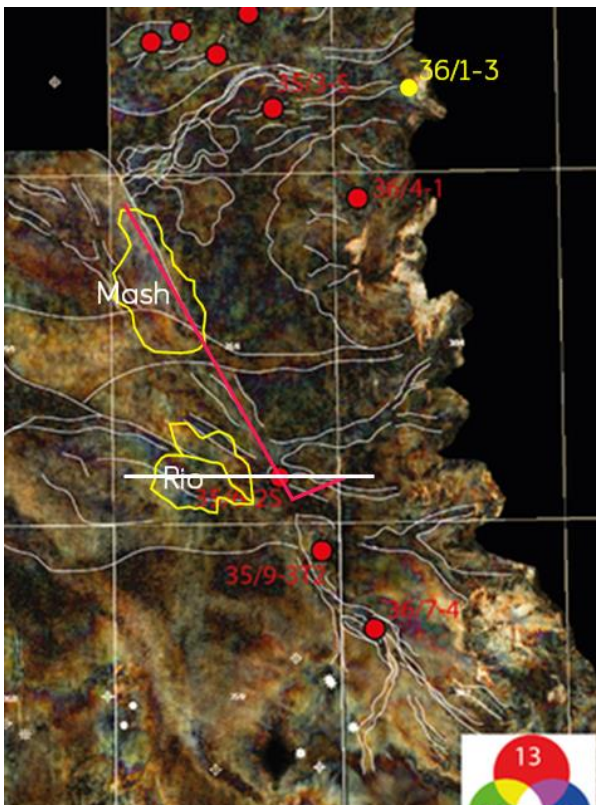


Figure 2: Gravity flow sediments fed from Norwegian mainland into the Måløy Slope, feeding Mash and Rio prospects.

## Results of geological and geophysical studies

The main prospectivity in PL930 is the Lower Cretaceous Agat Formation, where the two main prospects Mash and Rio have been evaluated.

The prospects Rio and Mash are amplitude driven prospects and represent similar play concept to the 2016 36/7-4 Duva discovery and the recently Equinor drilled Presto prospect, well 36/1-3. The prospects represent the same depositional system as the Duva discovery, with sediments sourced from the Norwegian mainland, but the prospects are in a more basinward setting (Figure 2), where more unconfined flows are expected.

The main risk for both Rio and Mash is trap seal (0.15). The prospects require an efficient seal within the channel/fan systems in a proximal up dip direction. This pinch-out is seen as challenging due to not very well supported reservoir pinch-out in an up-dip direction towards the dry 35/6-2S well (Figures 2,3, and 4). The feeder system has been active through time, and the reservoir is sand rich with no clear evidence of lateral consistent intra-formational shale barriers identified in wells.

The Rio prospect (Figure 4) is a very high-risk prospect with potentially two segments with high seal risk due to the nearby sand rich Grosso well, and no proper trapping mechanism for any of the two segments. It would be easier to pinch out both Mash and Rio using just a one seismic loop reservoir thickness. However, the volumes would then be very small and not of interest economically.

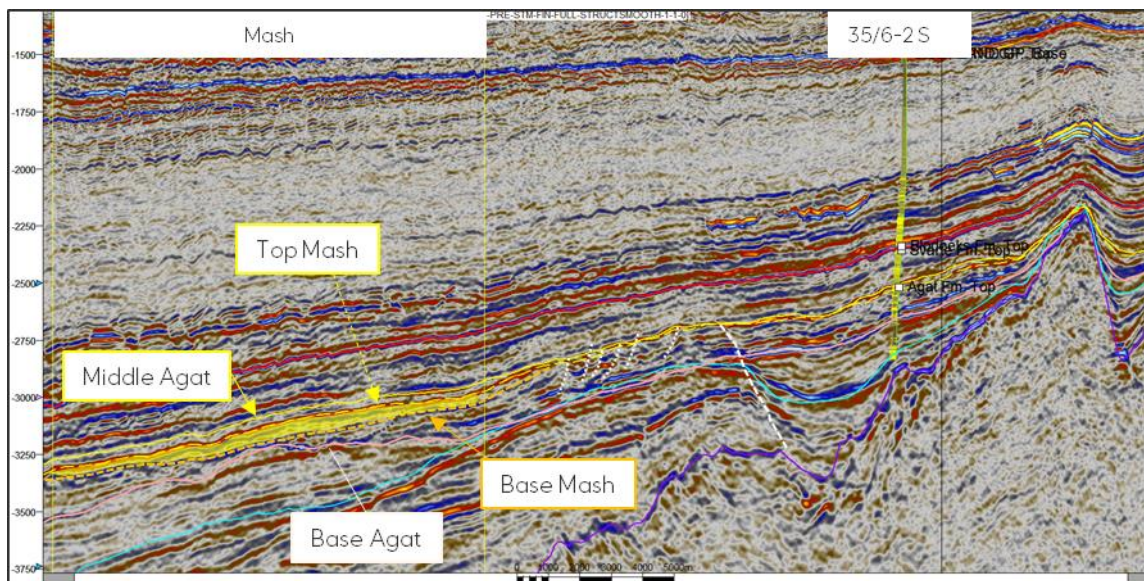


Figure 3: Seismic section from Mash up to Grosso, well 35/6-2 S. For location of seismic line, see Figure 1.



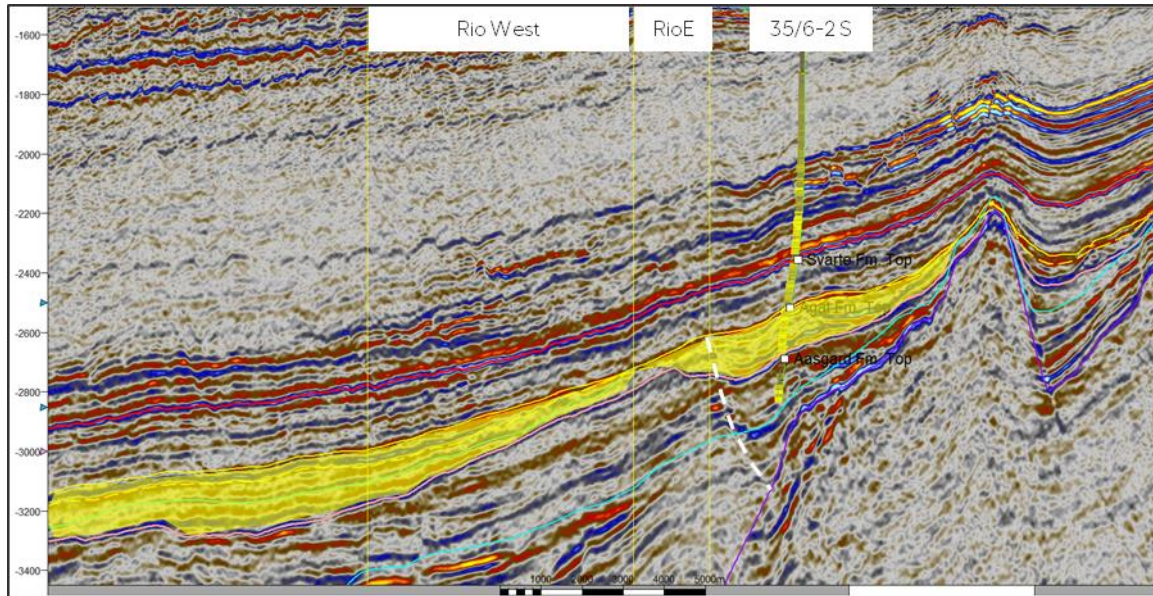


Figure 4: Seismic section through Rio and up to Grosso well 35/6-2 S. For location of seismic line, see Figure 1.

The main source rock is the proven Heather Formation, mostly in a gas mature setting around the prospects in PL930. The Agat discoveries in block 35/3 have a lean gas condensate fluid type. Furthermore, Draupne Formation source rock is present in an area which could add to the fluids within the prospects.

AVO work carried out for the PL930 license suggests that the main amplitude in the Mash prospect is due to tuning effect, and there is a correspondence between thickness of internal mappable units within Mash and minimum attributes. AVO is expected to highlight sand reservoir presence and shows the sand depositional fairway.

### 3 Prospect update report

Prospect evaluation has been carried out for many levels within PL930. Unfortunately, all prospects and leads carry a low Pg together with borderline volumes. Therefore, the prospectivity is considered non-economic. See Table 3 for volumes and risks.

Prospect segments	GeoX ID	Prospect/lead	Age	Formation	UNDISCOVERED	In-place res. (MSm3 o.e.) Total resources, Total Structure			Recoverable res. Oil (MSm3) 100%, Total Structure			Recoverable res. Gas (GSm3) 100%, Total Structure			Recoverable res. Condensate (MSm3) 100%, Total Structure			Poll %	Pgas %	Pg %			
						P90	Mean	P10	P90	Mean	P10	P90	Mean	P10	P90	Mean	P10						
35/6 Mash_K1_Alb	688422	Prospect	Albian	Aqat Fm	Gas case	4.49	17.80	37.58				1.63	6.47	13.90	0.13	0.55	1.15	3.8	9.0	12.8			
						Oil case	13.63	54.89	117.50	3.55	14.70	30.60	0.56	2.35	5.04						3.8	9.0	12.8
35/6 Rio West Aqat	688344	Prospect	Early Cretaceous	Aqat Fm	Gas case	1.27	5.34	12.65				0.47	1.96	4.70	0.03	0.14	0.34	7.3	12.1	12.1			
						Multiple case	2.30	13.29	32.39	0.56	3.11	7.54	0.08	0.45	1.08	0.003	0.05	0.11	7.3	12.1	12.1		
35/6 Rio East Aqat	688346	Prospect	Early Cretaceous	Aqat Fm	Gas case	2.41	5.78	10.83				0.89	2.12	3.91	0.05	0.15	0.29	2.4	4.1	4.1			
						Multiple case	3.40	12.33	24.34	0.79	2.62	5.13	0.11	0.38	0.74	0.009	0.07	0.15	2.4	4.1	4.1		
35/6 Lokal Main	685145	Lead	Eocene	Intra Balder Fm ss	Oil case	13.40	115.00	289.70	3.04	27.60	69.40	0.13	1.23	3.11					2.2		2.2		
35/6 Sillus3	648385	Prospect	Late Cretaceous	Tryqqvasson Fm	Gas case	9.69	11.55	13.66				5.71	7.05	8.48	0.30	0.41	0.54	1.1	9.7	10.8			
						Oil case	44.36	52.27	60.49	10.20	15.20	20.20	0.81	1.20	1.63						1.1	9.7	10.8
35/6 Laks_K2_Tryqqvasson	637139	Lead	Late Cretaceous	Tryqqvasson Fm	Oil case	47.30	47.30	47.30	14.20	14.20	14.20										11.2		11.2

Table 3: Updated risks, in-place and recoverable resources for prospects and leads in PL930.

## 4 Technical evaluation

The Mash prospect was evaluated as a potential gas case subsea tie-back to the Gjøa platform.

## 5 Conclusion

The work program for PL930 has been completed with the evaluation of prospectivity on the 3D seismic surveys listed in Table 1. The seismic data was used to evaluate the Mash and Rio prospects as well as the Lokel lead, and to carry out AVO analysis. Updated prospect evaluation unfortunately did not lead to lower risk or better volumes compared to the APA volumes, and are considered non-economic. Based on this, the partnership does not see any attractive drilling candidate in PL930 and have decided to drop the license.