Norskolje&gass



Released Wells Project from bag to digital data

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Background for the Project - Konkraft report



✓ Report published February 2018

- ✓ The report proposed 28 actions
- ✓ One of the proposals was to drill stratigraphic wells

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Konkraft Initiative – Stratigraphic Wells





With a twist

Concept

• Analyse and digitalize cuttings from the 1500+ released exploration and appraisal wells on the NCS

Purpose

- Prepare drilling and exploration for the digital future
- Provides an unbiased complete digital library for cooperation on NCS

50 years of history

• Entered into the big data 21st century technology







Released Wells Project Organization







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Participants

Equinor	IPN
Aker BP	Suncor
Petoro	OKEA
Vår	DNO
Lundin	Concedo
Spirit Energy	Edison
Total	Pandion Energy
DEA Wintershall	Petrolia
Neptune Energy	Inpex
DNO North Sea	M Vest
CoP	One-Dyas
Repsol	Chrysaor
Shell	
Capricorn	
MOL	

Project Administrator



Norwegian Oil and Gas Association (Norsk olje og gass) is an employer and industry association for companies which conduct or are suppliers to oil and gas operations, offshore renewable energy generation and offshore mineral extraction in Norway

Our strategic goals are that the Norwegian oil and gas industry shall be, and shall be recognised as

- the driving force for value creation, innovation and welfare in the Norwegian society
- a future-oriented industry that actively contributes towards solving climate challenges
- a global leader in health, environment and safety

Suppliers







STRATUM RESERVOIR Laboratories



With locations on six continents, Stratum Reservoir supports energy resource investment and divestiture strategies worldwide through the analysis and interpretation of rocks and fluids.

Main Services include:

Routine and Special Core Analysis PVT Reservoir Fluids Sampling & Analysis Improved and Enhanced Oil Recovery Analysis Geochemical Analysis and Interpretation Petrographic and Mineralogical Analysis Core and Fluid Storage Services Equipment Manufacturing

Introduction to the project







Overview of the project goals



All drilling cutting samples from ${\sim}1500$ released exploration and appraisal wells

- ✓ digital
- ✓ shareable through Norwegian National Data Repository for Petroleum data (DISKOS)



The project key element



Improve geological understanding

- ✓ Safer operations
- ✓ More efficient drilling
- ✓ Cut time and cost
- ✓ Find more HC

Project description





Standard, non destructive analyses for all wells

- high resolution photographing (Wh/UV)
- XRF(X-ray fluorescence)

5% of the wells - destructive analyses

- QemScan (energy- dispersive X-ray spectroscopy)
- SpecCam (Infrared spectroscopy)
- TOC (Total organic content)
- XRD (X-ray diffraction)

Norskehave SVERIGE FINLAND ESTLAND

5% of project wells:

1	7220/6-2 R	7220/6-2	Lundin Norway AS
2	25/2-18 C	25/2-18	Aker BP ASA
3	25/2-18 B	25/2-18	Aker BP ASA
4	25/2-18 A	25/2-18	Det norske oljeselskap ASA
5	6407/7-9 A	6407/7-9	Statoil Petroleum AS
6	7220/11-3 AR	7220/11-3	Lundin Norway AS
7	30/4-3 S	30/4-3	Total E&P Norge AS
8	36/7-4	36/7-4	ENGIE E&P Norge AS
9	6407/7-9 S	6407/7-9	Statoil Petroleum AS
10	1/5-5	1/5-5	Total E&P Norge AS
	35/11-20 B	35/11-20	Wintershall Norge AS
11	25/2-18 5	25/2-18	Det norske oljeselskan ASA
12	35/11-20 0	35/11-20	Wintershall Norge AS
13	6705/7_1	6705/7-1	Poncol Norgo AS
14	6703/7-1	6703/7-1	Repsol Norge AS
15	25/10-15 S	25/10-15	Det norske oljeselskap ASA
16	30/11-14 B	30/11-14	Statoil Petroleum AS
17	31/7-1 A	31/7-1	Faroe Petroleum Norge AS
18	16/5-6	16/5-6	Tullow Oil Norge AS
19	30/11-14	30/11-14	Statoil Petroleum AS
20	31/7-1	31/7-1	Faroe Petroleum Norge AS
21	7121/8-1	7121/8-1	Statoil Petroleum AS
22	35/11-20 S	35/11-20	Wintershall Norge AS
23	30/11-13	30/11-13	Statoil Petroleum AS
24	30/11-12 A	30/11-12	Statoil Petroleum AS
25	35/11-19 S	35/11-19	Wintershall Norge AS
26	35/8-6 A	35/8-6	Wintershall Norge AS
27	25/4-11	25/4-11	Aker BP ASA
28	30/11-12 S	30/11-12	Statoil Petroleum AS
29	16/1-26 A	16/1-26	Det norske oljeselskap ASA
30	35/8-6 S	35/8-6	Wintershall Norge AS
31	16/1-26 S	16/1-26	Det norske oljeselskap ASA
32	7324/7-3 S	7324/7-3	OMV (Norge) AS
33	30/11-11 A	30/11-11	Statoil Petroleum AS
34	30/11-11 S	30/11-11	Statoil Petroleum AS
35	34/6-4	34/6-4	Total E&P Norge AS
36	30/9-28 S	30/9-28	Statoil Petroleum AS
37	24/9-11 S	24/9-11	Aker BP ASA
-			

38	7318/12-2	7318/12-2	Eni Norge AS
39	7318/12-1	7318/12-1	Eni Norge AS
40	6407/10-4	6407/10-4	Lundin Norway AS
41	7222/1-1	7222/1-1	Eni Norge AS
42	16/1-25 S	16/1-25	Lundin Norway AS
43	35/11-18 A	35/11-18	Wintershall Norge AS
44	34/8-16 S	34/8-16	Statoil Petroleum AS
45	6406/12-5 S	6406/12-5	VNG Norge AS
46	7220/6-2	7220/6-2	Lundin Norway AS
47	6306/5-2	6306/5-2	Repsol Exploration Norge AS
48	7220/11-3 A	7220/11-3	Lundin Norway AS
49	35/11-18	35/11-18	Wintershall Norge AS
50	25/11-28	25/11-28	Statoil Petroleum AS
51	6407/10-5	6407/10-5	A/S Norske Shell
52	6406/12-4 A	6406/12-4	VNG Norge AS
53	3/7-10 S	3/7-10	Premier Oil Norge AS
54	2/4-23 S	2/4-23	Statoil Petroleum AS
55	16/7-11	16/7-11	Statoil Petroleum AS
56	7220/11-3	7220/11-3	Lundin Norway AS
57	30/9-27 S	30/9-27	Statoil Petroleum AS
58	16/1-23 S	16/1-23	Lundin Norway AS
59	6406/12-4 S	6406/12-4	VNG Norge AS
60	16/4-9 S	16/4-9	Lundin Norway AS
61	10/4-1	10/4-1	Wintershall Norge AS
62	6507/11-11	6507/11-11	Tullow Oil Norge AS
63	15/6-13 B	15/6-13	Statoil Petroleum AS
64	35/12-5 S	35/12-5	Wintershall Norge AS
65	25/10-13 S	25/10-13	Suncor Energy Norge AS
66	16/1-22 B	16/1-22	Det norske oljeselskap ASA
67	7220/11-2 A	7220/11-2	Lundin Norway AS
68	33/2-2 S	33/2-2	Lundin Norway AS
69	6706/11-2	6706/11-2	Statoil Petroleum AS
70	16/1-22 A	16/1-22	Det norske oljeselskap ASA
71	15/6-13 A	15/6-13	Statoil Petroleum AS
72	16/1-22 S	16/1-22	Det norske oljeselskap ASA
73	6407/8-7 A	6407/8-7	Statoil Petroleum AS
74	15/12-24 S	15/12-24	Talisman Energy Norge AS
75	34/4-14 S	34/4-14	Suncor Energy Norge AS



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Examples of project data use



Cuillin project -300 wells- ML, neural network



Lundin- geosteering with XRF RT





- Geosteering with SpecCam
- Stratigraphic, petrophysicall control with XRF real time for geosteering or completion of wells

Time schedule



September 2019	Signed of contract with Stratum&Rockwash, and started of detailed planning
October 2019	Start up with the first 75 wells – the project should aim to take minimum 50 wells per month and deliver in batches every month and by end of 2019 has delivered the first 150 wells
From 1st January 2020 – end 2021	Delivery of analyses from minimum 50 wells per month
After 30 months from the start	End Project (~1500 wells delivered on a digital format)

The purpose of Released Wells project

- ✓ Revitalization of old well data,
- \checkmark Entire well not just the reservoir
- ✓ Cross disciplinary approach (subsurface and drilling)

✓ Screening

- •Basic program
- •Short lead time
- •Reasonable cost

 \checkmark Shareable Digital database







