2.4.4 RFT Measurements

Formation pressures were measured in the Cretaceous using the Schlumberger RFT tool. The data is listed in Table 2.7. In figure 2.3 the pressures are plotted versus depth. As the data show, some points were tight and could not be used.

The upper zone between 3445 and 3471m RKB has a gas gradient of 0.4 psi/m. In the deeper zone between 3525 and 3541m RKB a water gradient of 1.54 psi/m is indicated. This gradient is less reliable due to few points of measurement and some spreading in the values.

The two zones mentioned seem to belong to different pressure systems.

In Table 2.8, the RFT pressure readings in the Jurassic Sandstones are listed.

Table 2.7: RFT Pressure Measurements, Lower Cretaceous. WELL 35/3 - 4

DEPTH	NUMBER	HYDROSTATIC	DRAWDOWN	FORMATION	REMARKS
3446	2	7187	4792	5093	,
3449.5	3	7193	4938	5090	
3451.5	4	7198	5040	5091	
3456.5	5	7210	5025	5092	
3465	6	7228	5063	5095	
3467.5	23	7210+	5005	5097	⁺ Test made coming up, may
3469.8	22	7215+	0	5125	affect repeatability still
3483.8	12 .	7263+	5311	7088	building when retract
3484.2	13	7265+	4800	7092	
3486.3	.14	7268 ⁺	0	· 5231	•
3489	7	7280	83	5390	
3491	8	7279	10	26	Tight
3491.3	9	7280	0	0	Tight
3492.5	11	7283	0	0	Tight
3493	10	7283	0	0	Tight
3501	15	7300	0	0	Tight
3506	16	7312	0	0	Tight
3527	17	7356	2860	5291	•
3531.5	18	7364	1459	5299	
3535.5	21	7362+	0	5315	
3538.5	19	7380	681	5719	Still building when retrac
3548.7	. 20	7401	0	0	Tight

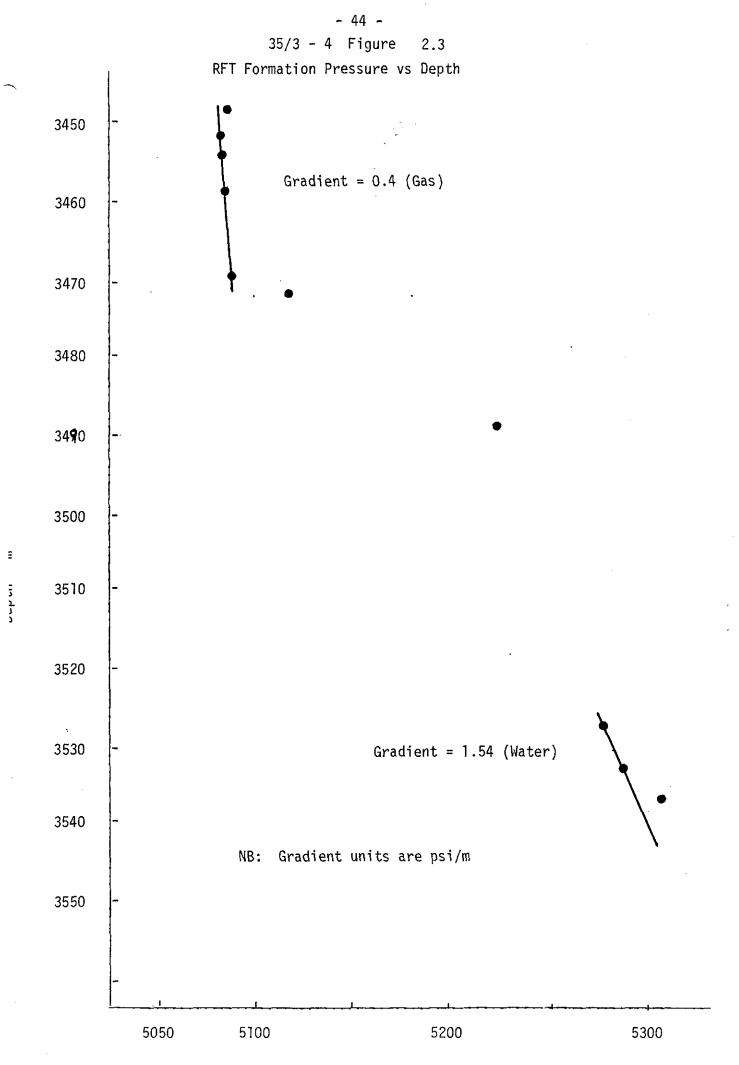
⁺ The Formation Pressure is Temperature Compensated.

- 42

TABLE 2.8 RFT PRESSURE MEASUREMENTS, JURASSIC WELL 35 / 3 - 4

Depth	Formation (psi)	Remarks
3859.5		No seal
3859.0		Tight
3859.3	. 6148	No seal
3860.0		Sampling point
3862.0		No seal
3861.8		'No seal
3869.5		No seal
3872.5		No seal
3872.5		Tight
3874.0	6941	No permeability, super charge
3873.0		Tight
3875.5	6395	
3877.0		Tight
3877.0		Tight
3876.5		Tight
3877.5	6410	
3874.5		Tight

⁺ The Formation Pressure is Temperature Compensated.



Pressure - psig

DST MEASUREMENTS

35/3-4 DST-1 SUMMARY AND DISCUSSION OF RESULTS

- 45 -

1. Test interval

2.4.5 .

The lower Cretaceous sandstone was perforated with 4" csg. guns (4SPF) over the following interval:

3488,50 - 3495,00

3498,25 - 3503,25

3504,50 - 3507,75

Depths are in mBRT ref. ISF/SONIC Run 3B.

2. Flow and Shut-in periods

The well was opened for appx. 10 minutes for initial flow followed by initial p.b.u of 134 minutes.

Due to no indications of flow during first period it was decided to attempt injection into the formation. After bullheading into formation the N₂ backpressure was bled off to start the main flow period. The wellhead pressure was decreased to atmospheric pressure with no indications of flow. While observing the well, the APR-M valve inadvertently sheared. Mud from annulus U-tubed into D.P. and pushed cushion and a small amount of h.c. gas to surface. This concluded the flow test and the final p.b.u. of 197 minutes was recorded during reversing out.

3. Fluid production

No rates were measured since production was not established.

4. Fluid sampling

Four one litre water samples were taken as the well was reversed out.

On site analysis as follows:

Sample	<u>c1</u>	<u>Ca++</u>	<u>Mg++</u>
1 '	19000	400	543
2	19000	240	243
3	8000	280	437
4	15000	240	583
Mud filtrate	9000	280	0
Sea water	18500	240	720
Fresh water	500	40	50

Gas samples were taken for on site analysis only. Exlog's chromatograph gave the following composition:

cı	90,5%
\mathfrak{c}_2	5,4%
c_3	2,6%
iC4	0,5%
nC4	0,8%
C_5	0,2%

There was no trace of H2S.

5. Interpretation of Pressure data

The Horner plot from the initial build-up based on Sperry Sun gauge No. 0121 shows the extrapolated pressure $p^* = 5375$ psig and a slope of 795 psi/log cycle. The gauge was set at 3469 mBRT. The Horner plot from the second build-up period shows a continuous curvature upwards indicating that the well has not been shut-in long enough.

No value for kh has been determined since no good estimates for flow rates exist.

35/3-4 DST-2 SUMMARY AND DISCUSSION OF RESULTS

Test interval

The lower Cretaceous sandstone was perforated with 4" csg. guns (4SPF) over the following interval:

- 47 -

3445,00 - 3447,50

3449,25 - 3453,50

3454,50 - 3459,50

3464,00 - 3471,50

Depths are in mBRT ref. ISF/SONIC Run 3B.

2. Flow and Shut in Periods

Prior to opening the well, it had been established during the pressure testing of the well that the APR-N valve leaked when pressurized from above. Despite of this, it was decided to go ahead with the test. The well was flowed for a 7 minute initial flow period and the shut-in for a 84 minute initial shut-in. An increase of 25 psi was observed in 2 minutes at the well head after opening the APR-N tester valve, prior to opening the choke manifold, indicating the APR-N valve to be open.

While trying to open the APR-N tester valve for the first main flow period, the APR-M circulating valve sheared at 2000 psig, aborting the test. The APR-M valve was set to shear at 2400 psig annulus pressure.

3. Fluid Production

There was no trace of gas while reverse circulating the string.

4. Fluid Sampling

2 samples of the fluid reversed out through the drill pipe was taken. The analysis of the fluid indicates that it was water cushion.

5. Pressure data

The APR-N valve appears to have leaked during the whole test and the pressure data does not seem to be valid. The report from Sperry Sun is not available yet, but will be distributed as soon as it is received.

5/3-4 DST-2A SUMMARY AND DISCUSSION OF RESULTS

1. Test interval

The lower Cretaceous sandstone was perforated with 4" csg. gun (4SPF) over the following interval:

3445,00 - 3447,50

3449,25 - 3453,50

3454,50 - 3459,50

3464,00 - 3471,50

Depths are in mBRT ref. ISF/SONIC Run 3B. The interval was perforated prior to DST-2.

2. Flow and Shut-in Periods

The well was flowed for 6 minutes initial flow and then shut-in for 63 minutes initial build-up. The well was then opened up for the first main flow period on a 32/64" choke for 3 hrs and 47 min before flowing through a 36/64" fixed choke for the remaining part of the first main flow period, 13 hrs 12 min.

The well was then shut-in for 16 hrs and 28 min. Wellhead pressure increased to 3840 psig during the first hour of shut-in, indicating that the downhole APR-N tester value did not close.

When the down hole valve was "opened" for the second main flow period, no increase in wellhead pressure was observed while keeping choke manifold closed.

The choke manifold was then opened and due to hydrate problems the well was flowed at a high rate initially to warm up the well. After 3 hrs and 45 min the well was stabilized on a 24/64" fixed choke and flowed at this setting for 13 hrs and 5 minutes.

The well was then shut-in by shearing the APR-M circulating valve to

- 50 -

ensure proper bottom hole shut-in. The well was shut in for 16 hrs and 30 min before the packer was released.

3. Fluid production

The well flowed gas during the first main flow period at 24.30 MMSCF/D on a 36/64" shoke and a flowing wellhead pressure of 3055 psig. The corresponding condensate flow rate was 528 B/D.

The last gas rate measured during the second main flow period was 12.63 MMSCF/D on a 24/64" shoke and a flowing well head pressure of 3584 psig. The corresponding condensate flow rate was 326 B/D.

The gas gravity was 0.62 (air = 1) and condensate gravity was 50.3 OAPI.

4. Fluid sampling

Three sets of gas and condensate samples for recombination were taken under separator conditions during each of the two main flow periods.

Samples of water and condensate from the separator were also taken under atmospheric conditions.

5. Interpretation

The reservoir encountered in 35/3-2 is thought to be very close to its dew point. The reservoir penetrated by 35/3-4 is in a different pressure regime showing the two reservoirs to be different. From the current data it is difficult to say if the 35/3-4 reservoir is close to its dew point or not. This may be clarified by the PVT analysis. The preliminary pressure analysis presented is based on Sperry Sun gauge No. 0124 located at 3424.6 mBRT.

The extrapolated pressure, p^* , for the initial flow, from the Horner plot is 5067 psig.

The build-up period following the first main flow period was analyzed by regular Horner plot. A log-log plot of p vs t shows that the pressures after about 100 minutes are not affected by wellbore storage and can be used for traditional build-up analysis. The extrapolated pressure p* was 5025 psig and the slope m was 118 psi/log cycle. This gives a permeability of 14.5 md and no skin using net thickness of 46 ft.

The build-up period following the second main flow period was analyzed by using the principle of superposition. Extrapolated pressure, p^* , was 5025 psig and the slope, m, was 88 psi/log cycle. This gives a permeability of 9.1 md and a skin of -2.7.

The skin was less for the lower flow rate as expected considering turbulence. The possible effect of any liquid condensation in the formation on skin and permeability will be evaluated when the PVT data are available.

3.4.4 Ta);

Mud recap 35/3-3

Casing interv	val	Total	30"	20"			·
Material Un	nit Weight	Quantiy	Quantity	Quantity			
Milbar	L/T	407		407			
Wyoming Bentonite	50 kg	1986	968	1018			
Milgel	50 kg	1227	120	1107			
Soda Ash	50 kġ	9	2	7			
Bicarb. of Soda	50 kg	10	10				•
Caustic Soda	25 kg	107	15	92			
Gypsum	50 kg	21	21				
Drispac.Reg	50 lbs	2		2			
CMC HiVis	25 kg	8		8		r	
Milfree	55 gal	4		4			
Milspot	50 lbs	73		73			-

Mud recap 35/3-4

Casing inte	erval	Total	30"	20"	13 3/8"	9 5/8"	8 1/2" hole & testing
Material	Unit Weight	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity
Barite	M Ton	2.447,92	-	466,3	1.077,2	626	278,42
Wyoming Bentonite	50 kg	1.941	345	1.095	141	360	
Milgel	50 kg	4.473	95	1.056	2.402	530	390
Caustic So	da 25 kg	706	12	60	276	338	20
Soda Ash	50 kg	12	1		7	•	4
Milmica fi	ne 25 kg	158	35		123		
Milmica co	arse25 kg	153	30		123	•	
Unical	25 kg	2.277	•	11	1.365	705	196
Drispac S/	L 50 lbs	394			171	117	106
Drispac Re	g 50 lbs	113			33	79	1
CMC HiVis	25 kg	52			36		.16
CMC LoVis	25 kg	65	•		24	1.2	29
Gypsum	50 kg	454		₹,	454		
EML	55 gal	73			73		
MD-deterge	nt 55 gal	6	•		6		
Bicarbonat	e 50 kg	48			25	. 8	15
Milfibre LD-8 Lime Milplug fi		20 14 12 58	,	.•	20 5 12 58	9	
Milplug co Lubrisal Ammonium N	55 gal	38 24 5			38	22	2 .



COMPANY

Saga Petroleum A/S

WELL NO.

35/ 3-4

FIELD

Block 35/ 3

DATE

May 5,1981 thru May 28,1981



BAKER EASTERN, S. A.

4056 TANANGER, NORWAY TELEX: 856-33173 PHONE: 0459664/96520



BAKER PRODUCTION SERVICES NORWAY A.S.

REPLY TO:

4056 Tananger, Norway

Telephone: (04) 696790 - 696836 Warehouse: (04) 696628 - 696822

Telex: 40360 BPS N

Saga Petroleum A/S Postbox 5021

4001 STAVANGER

June 19, 1981 kh/117/RT

Dear Sirs,

Attached are the results of your drillstem tests. 1, 2, 2A conducted on your well 35/3-4 from May 5 - to May 28,1981.

Arrived on board Byford Dolphin May 5, 1981. Set up equipment pressure test all surface equipment and wait on completion of well.

On May 18, 1981 drillstring was run in with test tools to test interval 3488.5 - 3495, 3498.25 - 3503.25, 3504.5 -3507.75 for D.S.T. No. 1. All surface equipment and down hole test string was pressure test to 5000 psi with nitrogen, at which time APR-N valve was open and well would not flow.

On May 21. 1981 drillstring was again run in with test tool to conduct a test on interval 3445 - 3453, 3454.5 - 3459.5, 3464 - 3471.5 metres for D.S.T. No. 2. Due to failure of down hole tools this test was concluded on May 23. 1981 with no flow being registred.

On May 24. 1981 drillingstring and test tools were run in to test interval 3445 - 3453, 3454.50 - 3459.5, 3464 - 3471.5 metres for D.S.T. No. 2A. A.P.R.N. valve was open at 21:12 May 24, 1981 for initial flow period. Shuting for one hour and then reopened for a clean up rate of 5½ hours, at which time a twelve hour rate was conducted, and well was shut in for 16 hours and 18 minutes. Valve was open for flow period No.2. Because of low well head temperatures well was flowed for 3½ hours at a approx. rate of 25 - 30 mmcf/d to raise wellhead temperature. Flow was then cut back to 12.5 mmcf/d.

May 26, 1981 at 10.33. Flow was switched through separator for 12 $\frac{1}{2}$ hours and then shut in for 15 $\frac{1}{2}$ hours for buildups.

The gas flow rates was calculated in accordance with AGA Method No.3 using a pressure and temperature base of 14.73 psi. and 60 degrees F respectfully.

If there are any queries regarding this report, please do not hesitate to contact us.

Very Truly yours,

R. Tiessen

Baker Production Services Norway A/S

سياتكنون



COMPANY Saga Petroleum	A/S	 	<i>:</i>
WELL NAME 35/3-4			
FIELD Block 35/3	_TEST_INTERVAL_		
COUNTRY Norway			
BAKER TECHNICIAN Richard T	liessen		

Report Index

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NOTE: THE SECTIONS APPEARING IN THIS REPORT ARE INDICATED BY A CROSS

Operations Log







COMPANY	Saga	Petroleum
CLIMPAINI		

WELL NAME 35/3 - 4

Block 35/3 FIELD_

3488.5-3495 3498.25-3503.25 TEST INTERVAL 3504.5-3507.75

Operations Log

COUNTRY Norway

	BAKER TECHNICIAN Richard Tiesson PAGE 1 OF 5
DATE & TIME	OPERATIONS LOG
17/5/81 22:00	Schlumberger R.I.H. to perforate
23:51	" perforate 3497 Metres to 3507 metres at 4 shots per foot
18/5/71 01:30	Schlumberger R.I.H. to perforate
03:05	" perforate 3488 metres to 3497 metres
07:19	R.T. 7. Temperature recorder, recording section no 8731,66 - 388,
	inner housing no 30337, 120 hour clock no F2171, clock wound and
	stylus on, recorder at 3476.02 m.
07:23	R.P.G.3. Pressure recorder, recording section no 35020,0 - 10000
	P.S.I., inner housing no 32273, 180 hour clock no H 12059 with
	double pitch lead screw, clock wound and stylus on recorder at 3476.02m
07:28	R.P.G. Pressure Recorder, recording section no 36671, o - 10000
	psi, inner housing no 35272, 120 hour clock no F 2159 with double
	pitch lead screw, clock wound and stylus on at 3476,02 M
07:41	Gauges R.I.H. with Sperrysun Hanger
23:30	Rig Up Choke Manifolds
19/5/81 00:20	Flush surface lines, heater choke pressure tested to 5000 Psi
00:49	Pressure test O.K.
01:10	Pressure test surface equipment
03:55	Pressure Test O.K.
09:20	Well Opened on 28/64 adjustable choke
09:25	Well S.I. for 1 Hour biuld up
10:37	Commence series of pumping N\phi2 - to establish infection rate into
	formation
15:00	Open well on 52/64 adjustable choke

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FIELD______TEST_INTERVAL_____

Operations Log

COUNTRY

SERVICES	BAKER TECHNICIAN PAGE 2 OF 5
DATE & TIME	OPERATIONS LOG
19/5/81 15:15	Switch to 3" bypass (192/64)
15/16	Sheared APR - M Circulating valve
15:20	Reduce choke to 24/64
15:33	Gas to surface
15:38	Flare ignited
15:50	Well shut in at choke manifold
16:00	Well opened 24/64 adjsutable choke
16:02	Choke increased to 64/64
16:04	Flow through 3" bypass (192/64)
16:26	S.I.W. at choke manifold
16:36	Open 3" bypass to overboard (192/64)
16:42	S.I.W. at choke manifold, end of test no 1, commence reverse circulating
	and pulling out of hole
20/5/81	
04:55	Records out of well. Removed & Read charts
	Compleation of DST no 1. Commencement of DST no. 2
21/5/81 19:00	Schlumberger commence perforation programme
01:08	Schlumberger complete perforation programme
06:11	Amerada's run in hole for DST no. 2

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PRODUCTION				
SERVICES				

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WELL NAME	:							

___ TEST INTERVAL

Operations Log continuation form

	BAKER TECHNICIAN PAGE 3 OF 5
DATE å TIME	OPERATIONS LOG
22/5/81 22:15	Rig up surface lines
22:35	Preassure test surface lines
23:10	Preassure test OK
23/5/81 02:27	Halliburton A.P.R.N. tool opened for initial flow period
02:28	Open adjustable choke to 20/64
02:33	Close adjustable choke, and Halliburton A.P.R.N. tool, finishing
	5 minutes initial flow.
03;58	Re - open A.P.R.N. tool
04:01	Open adjustable choke to 32/64.
04:33	Fluid to surface, Halliburton A.P.R.N. tool sheared off.
04:37	Commence reversing out of hole.
04:45	Switch flow to 3" bypass.
05:00	Well shut in at surface, surface equipment rigged down,
	commence circulating
13:37	Amerada's out of hole
13:43	Stylus of Element no. 32347
13:49	Stylus of Element no. 9080
13:52	Stylus of Element no. 36670
24/5/81 00:15	Amerada's run in hole for DST no. 2A
03:32	Commence monitoring preassure testing of A.P.R.N. tool
03:50	Preassure testing of A.P.R.N. completed
14:25	Rig up surface lines for DST no. 2A
14:50	Commence preassure testing surface lines and equipment to
	5000 P.S.I.
15:36	Preassure testing programme completed



COMPANY		,				
			 	 		1
WELL NAME			 ·	 		
					* 1	

FIELD. ____TEST INTERVAL_ COUNTRY___

Operations Log

continuation form

SERVICES	BAKER TECHNICIAN PAGE 4 OF 5
DATE & TIME	OPERATIONS LOG
24/5/81 15:47	Dowell commence preassure testing string to 5000 PSI with N2
17:15	Dowell stop pumping
18:43	Dowell start pumping again
20:38	Dowell complete pumping to 5000 PSI
20:58	Commence bleeding off preassure overboard after preassure test,
	through variable choke
21:19	Preassure bled off
21:12	Open A.P.R.N. tool
21:13	Open choke to 20/64 adjustable
21:18	Shut in choke and A.P.R.N. tool
22:20	Preassure up to open A.P.R.N. tool
22:23	Well open on 32/64 adjustable choke
23:03	Switch flow through heater
25/5/81 00;35	Switch flow through 32/64 fixed bean choke
02;00	Switch flow through 32/64 adjustable choke
02:01	Switch flow through 36/64 fixed bean choke
02:46	Switch flow through separator
07:15	Switch flare to opposite boom
15:22	Shut in A.P.R.N. valve
15:25	Shut in A.P.R.N. choke manifold, commence monitoring surface build up
26/5/81 07:40	Open well on 20/64 fixed bean choke for rate no. 2
07:42	Shut in to repair leaking chicksan
07:50	Open well for 20/64 fixed bean choke
08:30	Switch flow to 36/64 adjustable choke



COMPANY				
WELL NAME	 	· ·		:

_____TEST INTERVAL___ FIELD.....

COUNTRY__

Operations Log completion form

SERVICES	BAKER TECHNICIAN PAGE 5 OF 5
DATE & TIME	OPERATIONS LOG
26/5/81 09:1	5 Reduce choke to 32/64
09:3	Reduce choke to 28/64
09:4	5 Reduce choke to 24/64
10:0	Reduce choke to 20/64
10:1	5 Switch flow to 20/64 fixed bean choke
10:3	3 Switch flow through separator
11:0	7 Switch flow through 20/64 adjustable
11:1	Switch flow through 24/64 fixed bean choke
16:4	4 Switch flare to opposite boom
27/5/81 00:2	Well shut in at choke manifold, end of DST no. 2A
00:2	1 shear A.P.R M valve and reverse circulate
00:4	9 Mud to surface
00:4	9 to 04:00 Rig out surface equipment
<u> </u>	

Well Test Report

3





COMPANY SAGA	WELL NO. 35/3 - 4	Well
FIELDBlock 35/3	3488:55-3495 3504:5-3507-755	Test Report
FICLU	INTERVAL ILSTED SOCIETIES	recport

BAKER TECHNICIAN R. Tiessen

DATE: 17/5. 81

BASE CONDITIONS: 14.73 POUNDS PER SQUARE INCH AT 60° F

COUNTRY Offshore Norway

PAGE ____1__OF__6__

BHP GAUGE DEPTH: 3474.19 - 3477.85	TUBING SIZE: 5 WEIGHT: 19.5 lb/ft. LENGTH: 3285 metres	
ELEVATION OF ZERO POINT: R K B	PACKER TYPE: Halliburton R.T.T.S. SIZE: 9 5/8 DEPTH: 3459 metres	
PRESSURES CORRECTED TO DATUM DEPTH:	CASING SIZE: 9 5/8 WEIGHT 53.5 1b/ft. LENGTH: 3477 metres	
BHP GAUGE NO. 35020 + 36671 RANGE: 0 - 10.000	LINER SIZE: WEIGHT TOP: BOTTOM:	
CALIBRATION NODATE:		

TIME	DATA	CHOKE	SUBSUR	FACE	WEL	HEAD !	DATA	AMBI-	SEPAR	ATOR		SAMPLES		GAS	OIL	WATER	GAS	
DATE &	ELAPSED	SIZE			TUBING		CASING	ENT			GRA	/ITY		FLOW	FLOW	FLOW	OIL	
TIME HOURS	TIME	64THS. INCH	PRESSURE PSI	TEMP.	PRESS. PSI	TEMP.	PRESS. PSI	TEMP.	PRESSURE PSI	TEMP.	OIL °API	GAS SP. GR.	BS&W %	RATE MMSCFD	RATE BBL/DAY	RATE BBL/DAY	RATIO CF/BBL	CHLORIDE PPM
17/5 8 2200	31				Schlu	mberge	r R.I.	H. to	perfor	ate _{for}	D.S	T no:	1					
2351				, -	ž.	15 .	perf	orate	interv	al 349	7– 3507r	nat 4 s	hots/fo	pt				
18/5.8	31							-										
0130				<u> </u>		**	R.I.	H. to	perfor	ate		-						
0305						11	perfo	rate	inte	rval 3	488 m -	3497 m	at 4 sho	ts/foot	, , , , , , , , , , , , , , , , , , ,			
0719					R.T.7.	Tempe	rature	reco	rder 66) - 38	8 ⁰ F, sty	lus on	and clo	k wound				
0723					R.P.G.	3. Pre	ssure	recor	der, 0	1000	0 p.s.i	11 13	11 11	ır				
0728					11	ı		11		п	11	11 11	п н	11	-	-		
0741				F	ll ga	uges p	icked	up an	d R.I.H	. with	Sperrys	un Hanç	er.					
2230 19/5 8					Comme	nce ri	gging	up ch	oke man	ifolds								
0020					Flush	lines	to bu	rners	, press	ure te	st heate	r choke	to 5000	p.s.i.				
0040					Press	ure te	st O.K	•				***						
0049					Packe	r set	at 345	9 met	res.									
0110					Press	ure te	st all	surf	ace equ	pment	with N2							
0355					Press	ure te	sts O.	к., с	ommence	pumpi	ng N2 do	wn tubi	ng.					

TIME	DATA	CHOKE	SUBSUR	FACE	WEL	LHEAD	DATA	AMBI-	SEPARA	TOR		SAMPLES		GAS	OIL	WATER	CAC	
DATE &	ELAPSED	SIZE			TUBING		CASING	ENT			GRA	VITY		FLOW	FLOW	FLOW	GAS	
TIME HOURS	TIME	64THS.	PRESSURE PSI	TEMP.	PRESS.	TEMP.	PRESS.	TEMP.	PRESS'/RE	TEMP.	OIL °API	GAS SP. GR.	BSAW %	RATE MMSCFD	RATE BBL/DAY	RATE BBL/DAY	RATIO CF/BBL	CHLORIDE
19/5 8	Ι							 										
0710					4990			Fin	ish pum	ping N	2							
1712								Com	mence p	ressur	e testi	ng top a	nd botto	m Maste	Valves			
0830								Pre	ssure to	esting	complet	te						
0833									" u	p stri	ng							
0840	A FINAL				4960													
0843								Com	mence h	eedin	nressi	re ove	board pr	tion to				
											g press	ire over	board pr	101 00				
				1.				ope	ning to	b1.								
0857 _j					1580		4.	Fin	ish ble	eding	pressure	-						
0900					1588													
0905					1595													
0908								Sta	rt pres	suring	to oper	tool						
0920		28			1604				<u> </u>	_	_		choke f	or init	al flow	•		
0925		S.I.			1220				close	l for	1 hour p	ressure	build u	p.				
0930		S.I			1227										1			
0935	1	11			1228													
0940		11			1228													
0945		'n			1228													-
0950		"			1228													
0955		11			1227													
1000		kiri Majarta			1227													

TIME	DATA	CHOKE	SUBSUR	FACE	WEL	LHEAD	DATA	AMBI-	SEPARA	TOR		SAMPLES		GAS	OIL	WATER	GAS	
DATE &	ELAPSED	SIZE			TUBING		CASING	ENT			GRA			FLOW	FLOW	FLOW	OIL	
TIME HOURS	TIME	64THS.	PRESSURE PSI	TEMP.	PRESS. PSI	TEMP.	PRESS.	TEMP.	PRESSURE PE)	TEMP.	OIL °API	GAS SP. GR.	BS&W %	RATE MMSCFD	RATE BBL/DAY	RATE BBL/DAY	RATIO CF/BBL	CHLORIDE PPM
19/5	81																	
1015		S.I.			1225		ļ				ļ		<u> </u>	 	<u> </u>	<u> </u>		
1030		s.i.			1223	Prep	are to	Re -	commenc	e numr	ning N2	to ver	ify Hall	hurton	rool is	ópen	e a month	
					1			1		- Pamp	1119 112	CO VCI	Try marr	Dur con	COO1 15	open.		
1037		11				CORE	ence pu	mbrud	NZ									
1139		.,			2 5 50	Try	to pres	Sura	Hallibu	rton t	hol one							
l						Ì	1	1	ł	L COII C	DOI OPE	1						
1145		"				Cont	nue pu	† – – –	J NZ				<u> </u>			ļ		
1245		11			3972		*	L7	"									
	-					Cton	pumpin	<u> </u>									-	
1250		"				Scop	bambru	# 							ļ <u>.</u>			
1300		,,			3950													
																		· · ·
1303		11			<u> </u>	Re-c	mmence	pump	ing N2									
1305					4220			11	"									
					-											T		
1310		11			4576			ļ					 	 	 	-		
1315		11 .			4800													
1320		11	<u> </u>		5060	Stop	pumpin	g					<u> </u>		<u> </u>	ļ		
1322		11			5060								}					·
4204		,,				 										<u> </u>		
1324		ļ			5054	ļ	<u> </u>				ļ		ļ	<u> </u>				
1325		п			5052	Re-c	ommence	 pump	ing N2									
1220		11			F 400			ļ -						<u> </u>	<u> </u>			
1330		ļ <u></u>			5420	 		<u> </u>	<u></u>				<u> </u>		 	 		
1335		11			5520													
					<u> </u>]	T		<u> </u>		<u> </u>	 			<u> </u>			<u> </u>
1338		51			5580	Stop	pumpin	ià	 				ļ	-				
1340		n n			5580													

Well Test Report Continuation Form

TIME	DATA	CHOKE	SUBSUR	FACE	WEL	LHEAD	DATA	AMBI-	SEPARA	TOR		SAMPLES	A Section of the Sect	GAS	OIL	WATER	GAS	Same project
DATE &	ELAPSED	SIZE			TUBING		CASING	ENT			GRA	VITY		FLOW	FLOW	FLOW	OIL	
TIME HOURS	TIME	647HS. INCH	PRESSURE PSI	TEMP.	PRESS. PSI	TEMP.	PRESS.	TEMP.	PRESSURE PS	TEMP.	OIL °API	GAS SP. GR.	BS&₩ %	RATE MMSCFD	RATE BBL/DAY	BBL/DAY	RATIO CF/BBL	CHLORIDE PPM
	31										- CV						OLYGDE	FFW
1342		S.I.			5575			5.5										
1344		"			5565													
1346		11			5560													
1348		ıı ı			5561													
1350		n			5555		Re -	comm	ence pun	ping	N2							
1354		11			5640													
1358					5840													
1402		111			6030						-							
1405		11			6270	-				-								
1409		11			6330							3.7						
1409		n			6435		Stop	pump	ing N2									
1415	(***	11			6395													
1420		1			6385	7,18						2.5						
1425		11			6373													
4.607																		
1427							Comme	ence	bleedind	pres	sure dov	n to ze	ro overh	pard				
							thro	igh v	ariable	choke	<u> </u>							
1500		52			0		Flow	ng w	e11 53/6	4 adj	ustable	choke,	small bl	ow at su	rface			
									978			144 je						,
1515		192			0		Flow	well	through	3" b	ypass, a	nnulus	pressure	zero.	-			
1518		10			900		Fluid	to	surface,	samp	le taken							

Well Test Report Continuation Form

TIME	DATA	CHOKE	SUBSUR	FACE	WEL	LHEAD	DATA	AMBI-	SEPARA	ATOR		SAMPLES		GAS	OIL	WATER	CAS	
DATE &	ELAPSED	SIZE			TUBING	1.2	CASING	ENT			GRA	VITY	I	FLOW	FLOW	FLOW	GAS	
TIME HOURS	TIME	64THS.	PRESSURE	TEMP.	PRESS.	TEMP.	PRESS. PSI	TEMP.	PRESSURE F SI	TEMP.	OIL	GAS SP. GR.	BS&W	RATE MMSCFD	RATE BBL/DAY	BBL/DAY	RATIO CF/BBL	CHLORIDE
19/5.8	1	11011	r Gr		- 131				F 31		AFI	SP. GR.	/6	WINDON D	DDL/DA!	DOCTORT	CF/BBL	PPM
1520		24			1040		-	Red	uce chok	e to	4/64 ad	justabl	e					
1522		n.			1050													
1524		19	_	-	1090			Sam	ple take	n					•			
1526					1130													
1530		11		,	1220													
1533		11						Gas	to surf	ace								
1535		11			1435	56			-									-
1538		,,,						Fla	re ignit	ed we	ll slugg	ing flu	đ	-	-			
1540		11			1400	54							,	-				
11545		ī.			1300	49					N							
1550		s.I.			1110	46		Wel.	l shut i	n at i	n at ma	nifold						
1555		11			1610	47		Tub	ing pres	sure i	ncreasi	ng with	attempt	to				
				w.,		-		res	tore ann	ulus p	ressure	•						
1600		24			1455			Reo	en well	on 24	1/64 adj	ıstable	choke.					
1602		84						Inc	rease ch	oke to	64/64	adjusta	ole chok	† 				
1604		192						Swi	tch flow	to 3'	bypass							
1605		a F						Flu	id to su	rface								
1607		13						Sam	ole take	n, (p	essure	falling	t∞ rapi	elly for	readin	gs)		
1608		ıı.						11	. "		н	57	"		pp pp			
1610.	er.	11		<u> </u>	70	-		m	na srca	CIIFA	falling	with an	nulus pr	essure.	 	 		

Well Test Report Continuation Form

TIME	DATA	CHOKE	SUBSUR	FACE	WEL	LHEAD	DATA	AMBI-	SEPARA	TOR		SAMPLES		GAS	011	WATER	GAS	
DATE &	ELAPSED	SIZE	3 4 4 4	1 11	TUBING		CASING	ENT			GRA			FLOW	OIL FLOW	FLOW	OIL	
TIME HOURS	TIME	64THS. INCH	PRESSURE PSI	TEMP. °F	PRESS. PSI	TEMP.	PRESS.	TEMP.	PRESS JRE		OIL °API	GAS SP. GR.	BS&W	RATE MMSCFD	BBL/DAY	RATE BBL/DAY	RATIO CF/BBL	CHLORIDE
19/5.8	1	INCH	Poi	<u> </u>	P31		PSI	<u> </u>	PSI	°F	API	SP. GH.	76	MINISCED	OBL/DAT	BBL/DAT	CF/BBL	РРМ
1610	7 - 43 - 1	192		. 15 m				*	indica	ting c	ommunica	ition be	tween th	e two.				
1615		H			190													
1626	-	s.I.	_		0				Shut i	well	at chol	e manif	old.					
1630		11									0500							
1630									pressu	re up	to 2500	P.S.I.	with ric	pumps	prior t	b revers	e circu	lation)
1636		192																
1036		192							Open of	a bypa	ss to ov	erboard	•					-
1642		s.I.	• .		1.				Shut i	n well	at chok	e manif	old, rig	down				
						ļ			surface	equi	pment							
								•										
										<u> </u>	<u> </u>							
							END O	TES	T No. 1									
						*				-								1
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		<u> </u>													 	<u> </u>		
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														<u> </u>		<u> </u>		
		<u> </u>	<u> </u>	············		ļ		ļ						-	ļ			
		F																



Block 35/3 3445-3447.5	COMPANY_	SAGA	WELL NO.	35/3-4	
INITEDVAL TESTED 2442 OF 2452 5		Block 35/3			

Offshore Norway 3454.5-3459.5
COUNTRY BAKER TECHNICIAN 3464-3471.5

DATE: 21/5.81 BASE CONDITIONS: 14.73 POUNDS PER SQUARE INCH AT 60° F

R. Tiessen.

p. cs 1

Well Test Report

			A1	
BHP GAUGE DEPTH: 3423.58-3425.44	TUBING SIZE: 5"	WEIGHT: <u>1</u>	9, <u>5 1b/ft.</u> L	ENGTH: 3285 meters
ELEVATION OF ZERO POINT: RKB.	PACKER TYPE: Hall	iburton R.T.T.S.	SIZE: 9 5/8	DEPTH: 3410.03 meters
PRESSURES CORRECTED TO DATUM DEPTH:	CASING SIZE: 9 5/	8 WEIGHT	53,5 1b/ft. L	ENGTH: 3477 meters
BHP GAUGE NO. 32347 + 36670 RANGE: 0-10.000	LINER SIZE:	WEIGHT	TOP:	BOTTOM:
CALIBRATION NO.				

TIME	DATA	CHOKE	SUBSURFACE WELLHEAD DATA			DATA		SEPARATOR		SAMPLES			611.		1		نه سنستنی ا	
DATE & ELAPS		SIZE			TUBING	F 78 5	CASING				GRA		1	FLOW RATE MMSCFD	FLOW RATE BBL/DAY	WATER	GAS OIL RATIO CF/BBL	
TIME HOURS	TIME TIME 64TH	64THS.	THS PRESSURE TEM	TEMP.	PRESS.	TEMP. PRESS.	PRESSURE		TEMP. OIL	OIL °API	GAS SP. GR.	BS&W	RATE BBL/DAY			CHLORIDE		
21/5.8 1900	1				Schli	mber	er R.I	H. t	perfo	rate f	or DST 1	o.2		era.			- "	
2038					25.1.1	"				1			s,and 4	shots	per foot			
2130	-					11	R.I	.н. t	o perfo	rate								
2300						n.	per	forat	e inter	val 34	54.5-34	9.5 met	res "	11	ii n			
2330						11	R.I	.н. t	o perfo	rate								
22/5: 8 0108	1					.18	per	forat	e inter	val 34	49.25-3	147.5 me	tres "	ii.	11 11			
0502	÷ :				R.T.7	. tem							F2160,		itch			
	1				lead	screw	stylu	s on.										
0508					R.P.G	.3. P	ressure	Elen	ent No.	36670	, 180H-c	lock 10	39, dou	ble pito	h lead	screw st	ylus on	
0519					R.P.G	.3.	Pressur	e Ele	ment No	. 3234	7,120hr	clock I	o. F217	, singl	e pitch	lead so	rew sty	lus on.
0611					All ga	uges	run in	hole				- James						
2215					Rig u	p sur	face li	ne \$										