

DRILL STEM TESTS

## DRILL STEM TESTS

Three zones on the East Eldfisk 2/7-15x were drill stem tested between May 19 and May 27, 1980. These were both the lower and upper Cretaceous zones, and the Danian. All zones were perforated with two shots per foot.

### DST #1

11320-11332, 11362-11372, 11388-11396, 11402-11412, 11426-11442 feet RKB.

The 15 minute initial flow gave an extremely weak response. A two hour shut in followed, with maximum bottomhole pressure of 8955 psig at 11297 ft RKB.

The acid-frac job broke down the formation at 6000 psi and the maximum injection rate was 10 BPM. A total of 267 bbls of EQH 205 was used.

During the 4 3/4 hour flow period the well failed to clean up. Final bottomhole flowing pressure was 4076 psig on 64/64" choke. Only traces of oil and gas were observed, and the water was measured at 654 BWPD.

The well was shut in for 4 1/3 hours before the packer was un-seated for a maximum bottomhole pressure of 9632 psig.



# Flow Test Data Summary

PLATFORM EAST ELDFISK  
HAAKON MAGNUS WELL No. 2/7 15X DATE 18 May 1980

1. Test No. 1 Test Engr. Woodson/Brinkley Test Co. Halliburton
2. Precid Test , Postacid Test . Acid/Type EOH 205
3. Flow Commenced: Cleanup 14:25 Hrs.; Separator - Hrs.
4. Programmed Duration 4 Hrs. Flowing Duration 4.75 Hrs.

OIL	GAS	WATER	CHOKE SIZE	Flowing TBG		GOR	BS & W
				Pressure	Temp		
Trace	Trace	654	64/64	205	64		100
BPD	MMCFPD	BPD	INCHES	PSIG	F	SCF/BBH	%

GRAVITY		SEPARATOR		DRAEGER TESTS			Total Water Chlorides	Water	
OIL	GAS	PRESS.	TEMP	H <sub>2</sub> S	CO <sub>2</sub>	MERCAPTAN		Resistivity	Temp
				0	0.05	0	19,000		
API	S.G.	PSIG	°F	PPM	%	PPM	MG/LITER	OHM-M	°F

(Shrinkage Factor:)

7. Remarks: Max recorded BET = 247 °F  
2 hrs shut in with no surface B.u.

Perforated Interval: 11320-11332, 11362-11372, 11388-11396, 11402-11412, 11426-11442

9. Bottom Hole Pressures (Field Readings)

Bottom Hole Pressure Periods	Recorder <u>MRPG 0043</u>	Recorder <u>MRPG 0043</u>	Recorder <u>4508</u>	Recorder <u>4509</u>
	Depth <u>11287</u>	Depth <u>11297</u>	Depth <u>11314</u>	Depth <u>11310</u>
Initial Hydrostatic		8482	8367	8355
1st Flow Acid Jobs				
1st Shut in		8955	10181	10181
2nd Flow		4076	4012	4064
2nd Shut in		9632	9207	2959
3rd Flow				
3rd Shut in				
4th Flow				
4th Shut in				
Final Hydrostatic		8361	8442	8442

10. Distribution: ORIGINAL \_\_\_\_\_, 1 Copy: R.J. Rundt, 1 Copy: G.R. Smith.

WELL NUMBER 2/7-15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 18 May 1980  
 DST No. I

ENGR: ELB/AT			FLOWING CONDITIONS					SAMPLES							OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE	METERED	SCF/bbl
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP								BOPD	RATE MSCFD	BWPD	
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	mg/l	BOPD	RATE MSCFD	BWPD	19
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0514		Set packer																
0821		Open APR-N tester valve at surface																
0836		Shut in at surface																
0840		Shut in APR																
0845		Open APR																
0853		Shut in APR																
0910		Put 1500 psi on tubing and open APR at surface																
0915		<50																
0920		<50																
0925		<50 SI at surface																
0930		<50																
1000		<50																
1030		<50																
1100		<50																

PERFORATED INTERVAL: 11320-11332, 11362-11372, 11383-11396, 11402-11412, 11426-11442

WELL NUMBER 2/7-15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 18 May 1980  
 DST No. I

ENGR: ELB/AT		FLOWING CONDITIONS						SAMPLES							OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	WELLHEAD			SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE MSCFD	METERED	GOR
		PRESS	TEMP.		PRESS	SHRINK-AGE	OIL TEMP											
HOURS	64th IN.	PSIG	°F		PSIG	FACTOR	°F											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1125		<50 End of shut in period																
1220		Start acidizing																
1303		End acidizing																
1425		5015 - SI pressure																
1425	24/64	Open																
1430	32/64	Increase choke size																
1434		575	68															
1435		203	66											17000				
1440		80	66															
1441		<50	65															
1445		<50	64															
1450		<50	63															
1455		<50	62															

PERFORATED INTERVAL: 11320-11332, 11362-11372, 11388-11396, 11402-11412, 11426-11442

REVISED 5/78 Page 2 of 3

WELL NUMBER 2/7-15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 18 May 80  
 DST No. I

ENGR: ELB/AT			FLOWING CONDITIONS					SAMPLES								OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE MSCFD	METERED	GOR	
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP												BOPD
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	ppm	BOPD	MSCFD	BWPD	SCF/bbl	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1500	40/64		<50	62	(Divert to tank at 1505)							pH = 6½		19000					
1515			<50	62											0	0	780		
1530			<50	64								pH = 6½		17500			643		
1600			<50	66	(Switch to burner at 1614)							pH = 6					654		
1630			<50	65								pH=5		18500					
1700	64/64		<50	64			pH=5		1.2	>10%	0	0	Sed = 0	17500					
1730			<50	63			pH=3½			9	0	0	Sed = 0	19000					
1800			<50	61			pH=1			5	0	0	Sed = 3%	19000					
1815		Sample No. 1 from separator bypass																	
1820			72	66															
1830			107	60			pH=2			0.05%	0	0	Sed = <1%						
1845			182	60															
1900			230	62															
1908			205	64															
1910			Shut in at choke manifold																

PERFORATED INTERVAL: 11320-11332, 11362-11372, 11388-11396, 11402-11412, 11426-11442

REVISED 5/78 Page 3 of 3



# BJ SERVICE B.V.

NORSCO BASE - 4056 TANANGER - NORWAY

TELEPHONE (045) 96 533

TELEX 33245 bjser n

## JOB SUMMARY

Company: Phillips Petroleum Co. Norway date: 18.05.1980

Type of job: Spearhead Acid Control well no.: 2/7-15X

Stimulation Crew: \_\_\_\_\_

1. Treater .... : G. Thorarensen 2. Engineer ... : H. Warhaug

3. CSB operator : I. Berge 4. Pump operator: G. Want & B. Lilleland

5. Pump operator: K. Sandve 6. Helper ..... : A. Leschbrandt

Pumps used : 4 stk. V-16 Pacemaker Units

Formation broke at : 6000 psi to \_\_\_\_\_ psi

Pressure test to : 7500 psi

Max treating pressure : 6700 psi Min. treating pressure : 4800 psi

Max. injection rate : 10 bbls/min. Min injection rate: 2.5 bbls/min

Total fluid pumped : 740 bbls Fluid in formation: 570 bbls

Quantity and type fluids pumped: 267 bbls of SAC.

267 bbls of ACID EQH 205

26 bbls of DIVERTER

180 bbls of FLUSH

Average pressure increase on diverting stage: \_\_\_\_\_ psi

Maximum pressure increase on diverting stage: 400 psi

Minimum pressure increase on diverting stage: \_\_\_\_\_ psi

Instantaneous shut-in-pressure ..... : 5200 psi

Five minute shut-in-pressure ..... : 5150

Started treatment: 12:15 /pm Finished treatment: 13:58 am/pm

Remarks: Average pumping rate: 7,4 BPM

Stopped pumping 13:03 as diverter blocked our pumps.

Started pumping again at 13:06.

\_\_\_\_\_

\_\_\_\_\_



**BJ-HUGHES Inc.**  
A SUBSIDIARY OF HUGHES TOOL COMPANY

**TREATMENT LOG**

P.O. BOX 2250 LONG BEACH, CALIFORNIA 90801

Acid Stage No. \_\_\_\_\_

Date: 18.5.1980 District: Tananger F. O. No. \_\_\_\_\_  
 Company: Phillips Petroleum Co. Norway  
 Well No.: 15 X  
 Location: Continental Shelf State: Norway  
Haakon Magnus Field: 2/7  
 Casing: Size \_\_\_\_\_ Type & Wt. \_\_\_\_\_ Set at \_\_\_\_\_ ft.  
 Perf. From 11320 ft. to 11442 ft. No. of Perf. \_\_\_\_\_  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Perf. \_\_\_\_\_  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Perf. \_\_\_\_\_  
 Lining: Size \_\_\_\_\_ Type & Wt. \_\_\_\_\_ Top at \_\_\_\_\_ ft. Bottom at \_\_\_\_\_ ft.  
 Cemented: Yes/No. Perforated From \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 Tubing: Size \_\_\_\_\_ Swung at \_\_\_\_\_ ft.  
 Perforated From \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 Formation: Cretaceous  
 Open Hole Size \_\_\_\_\_ I.D. \_\_\_\_\_ ft. P.B. to \_\_\_\_\_ ft.

Type Treatment: Amt. \_\_\_\_\_ Type Fluid \_\_\_\_\_ Sls. Cement \_\_\_\_\_ Pound of Sand \_\_\_\_\_  
 Breakdown: 267 Bbl./Gal. SAC  
267 Bbl./Gal. EQH 205 Acid  
26 Bbl./Gal. Diverter  
 Flush: \_\_\_\_\_ Bbl./Gal. \_\_\_\_\_  
 Treated From 11320 ft. to 11442 ft. No. ft. 56  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. ft. \_\_\_\_\_  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. ft. \_\_\_\_\_  
 Calculated Volume to: Lead Hole 170 Bbl./Gal. Reach Form. \_\_\_\_\_ Bbl./Gal.  
 Actual Volume of Oil/Water to Lead Hole: \_\_\_\_\_ Bbl./Gal.  
 Pump Trucks Used: 4 stk V-16 Pacemaker Units  
 Auxiliary Equipment: CSB-20 Blender, Acid Pump  
 Packer: \_\_\_\_\_ Set at 11245 ft.  
 Auxiliary Tools: \_\_\_\_\_  
 Plugging or Sealing Materials: Type & Amt. Divert II Superflake  
 SOB (No & Type) \_\_\_\_\_

Company Representative: B. Custer / J. Brown Treater: G. Thoraransen

TIME M./P.M.	PRESSURES		FLUID PUMPED DATA GAL./BBL.				REMARKS
	TUBING	CASING	TOTAL FLUID PUMPED	FLUID IN FORMATION	PUMPED PER TIME PERIOD	PUMPED PER MIN.	
12:00							Pressure test
12:15							Start treatment, on SAC 1
12:36	6250		133		133	6.3	Off SAC 1 on Acid 1
12:41	6100		170		37	7.4	SAC 1 on formation
12:53	6000		267	97	97	8.1	Off Acid 1 on Div 1
13:02	5000		293	123	26	2.9	Off Div 1 on SAC 2
13:03	4800		295	125	2	2.0	Stop pumping, pumps blocked by diverter
13:06	4650						Pumps flushed, continue pumping
13:10	5150		203	133	8	2.0	Acid 1 on formation
13:25	6150		427	257	124	8.3	Off SAC 2 on Acid 2
13:26	6200		436	265	9	9.0	Div 1 on formation
13:29	6600		463	293	27	9.0	SAC 2 on formation
13:39	6200		560	390	97	9.7	Off Acid 2 on Displ.
13:43	6150		596	426	36	9.0	Acid 2 on formation
13:57	6600		730	560	134	9.6	Overflush on formation
13:58	6600		740	570	10	10.0	Finished
13:58	5200						I.S.I.P.
14:03	5150						5 min. S.I.P.
14:08	5150						10 min. S.I.P.
14:13	5100						15 min. S.I.P.



DST #2

9945-9960 feet RKB.

The well was flowed for 15 minutes on 48/64" choke and final bottomhole flowing pressure was 4594 psig at 9928 ft RKB. During the 2,4 hour shut in well built up to 5900 psig.

The acid-frac job broke the formation at 5200 psig. A total 71 bbls of EQH 205 acid was pumped of a maximum injection rate of 10.5 bbl/min.

The well was flowed for 5.07 hours on 36/64" choke and produced water with a maximum of 12% oil. Final bottomhole flowing pressure was 4347 psig and the last measured rate was 317 BWPD and 43 BOPD.

The pressure built up to 6645 psig during a 5.8 hours shut in period.



# Flow Test Data Summary

PLATFORM EAST ELDFISK  
HAARON MAGNUS WELL No. 2/7 15 X DATE 21 May 1980

1. Test No. 2 Test Engr. Willett/Woodson Test Co. Halliburton

2. Preacid Test , Postacid Test . Acid/Type EOH 205

3. Flow Commenced: Cleanup 18:10 Hrs.; Separator 0 Hrs.

4. Programmed Duration 4 Hrs. Flowing Duration 5:03 Hrs.

5.

OIL	GAS	WATER	CHOKE SIZE	Flowing TBG		GOR	BS & W
				Pressure	Temp		
43	Trace	317	36/64	172	60		88
BPD	MMCFPD	BPD	INCHES	PSIG	F	SCF/BBH	%

GRAVITY		SEPARATOR		DRAEGER TESTS			Total Water Chlorides	Water	
OIL	GAS	PRESS.	TEMP	H <sub>2</sub> S	CO <sub>2</sub>	MERCAPTAN		Resistivity	Temp
				0			35,000	0,141	55
API	S.G.	PSIG	°F	PPM	%	PPM	MG/LITER	OHM-M	°F

Shrinkage Factor:)

7. Remarks: Max recorded BHT = 217 °F

8. Perforated Interval: 9945 - 9960

### 9. Bottom Hole Pressures (Field Readings)

Bottom Hole Pressure Periods	Recorder <u>MRPG 0009</u>	Recorder <u>MRPG 0043</u>	Recorder _____	Recorder _____
	Depth <u>9938</u>	Depth <u>9928</u>	Depth _____	Depth _____
Initial Hydrostatic	7467	7570		
1st Flow	4582	4594		
1st Shut in	5555	5900		
2nd Flow	4322	4347		
2nd Shut in	6351	6645		
3rd Flow				
3rd Shut in				
4th Flow				
4th Shut in				
Final Hydrostatic	7379	7395		

10. Distribution: ORIGINAL \_\_\_\_\_, 1 Copy: R.J. Rundt, 1 Copy: G.R. Smith.

WELL NUMBER 2/7-15X  
 WELL NAME EAST ELDFISK

# Phillips Petroleum Company

DATE 22 May 1980  
 DST No. 2

ENGR: ELB/AT			FLOWING CONDITIONS					SAMPLES								OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPARATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAVITY	GAS GRAVITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLORIDES	METERED	SEPARATOR FLOW RATE	METERED	GOR	
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP												BOPD
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	mg/l	BOPD	MSCFD	BWPD	SCF/bbl	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1402																			
1418	48																		
1423			<50																
1428			<50																
1433			<50	55															
1445			<50	53															
1451			50																
1452			55																
1453			61																
1454			70																
1455			79																
1456			90																
1457			115																
1458			135																
1500			170	52															

PERFORATED INTERVAL: 9945-9960

WELL NUMBER 2/7 - 15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 22 May 1980  
 DST No. 2

ENGR: ELB/AT		FLOWING CONDITIONS						SAMPLES							OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE MSCFD	METERED	GOR
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP											
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	mg/l	BOPD	MSCFD	BWPD	SCF/bbl
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1502			210															
1504			235															
1506			267															
1508			312															
1510			340															
1515			413	50														
1520			480															
1525			530															
1530			590															
1540			707															
1550			812															
1600			910	58														
1615			1042															
1630			1150	62														
1633			1169	End Shut in														

PERFORATED INTERVAL: 9945-9960

REVISED 5/78 Page 2 of 6

WELL NUMBER 2/7 - 15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 22 May 1980  
 DST No. 2

ENGR:			FLOWING CONDITIONS					SAMPLES							OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE MSCFD	METERED	GOR
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP											
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	ppm	BOPD	MSCFD	BWPD	SCF/bbl
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1700																		
					Start Acid													
1748					Finish Acid													
1800			3650															
1810	20				Open well on 20/64" choke							pH=6	100	20000				
1811	28																	
1812	32		2350															
1814			1660	52														
1815	36																	
1816			810															
1818			415															
1820			277	54								pH=5½	100	20000				
1822			182															
1824			144									pH=6	100	21000				
1826			115	54														
1828			92															

PERFORATED INTERVAL: 9945 - 9960

REVISED 5/78 Page 3 of 6

WELL NUMBER 2/7 - 15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 22 May 1980  
 DST No. 2

ENGR:		FLOWING CONDITIONS						SAMPLES							OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE	METERED	SCF/bbl
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP								BOPD	MSCFD	BWPD	
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	ppm				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1830	36		73	55									100	18000				
1835			<50	56				SG <sub>w</sub> = 1.027 at 60°F					pH=6	100	22000			
1840			<50	57								6	100			2221		
1845			<50	58								6	100	19000				
1850			<50	59								6	100	22000				
1900			<50	61								6	100	19000				
1910			<50										pH=½	100		1325		
1915			<50	61														
1920													pH=½					
1930		Sample 1 from Separator Bypass												pH=3½				
1935														pH=4				
1945			<50	62										1940:4				
1948														1950:3			1116	
1955			56	63														
2000			94	64	First traces of mud.													

PERFORATED INTERVAL: 9945-9960

REVISED 5/78 Page 4 of 6

WELL NUMBER 2/7 - 15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 22 May 1980  
 DST No. 2

ENGR:		FLOWING CONDITIONS						SAMPLES							OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE MSCFD	METERED	GOR
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP											
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	ppm	BOPD	MSCFD	BWPD	SCF/bbl
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2005	36		95	64									97	(3% sed)				
2010			112	63	First traces oil								97	"				
2015			82	63	Sample No. 2 from Sep. Bypass							pH=2½	98	60000	trace			
2020			93	63														
2025			102	62														
2030			128	62														
2035			149	61														
2040			171	61								pH=2½	96	60000	trace			
2045			189	61													446	
2050			203	60														
2055			197	60														
2100			195	60								pH=3	97	53000	(1% oil)			
2115			178	60														
2120		Sample No. 3 From separator Bypass										pH=4½	96	48000	(2% oil)			
2130			159	60														

PERFORATED INTERVAL: 9945-9960

REVISED 6/78 Page 5 of 6

WELL NUMBER 2/7 - 15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

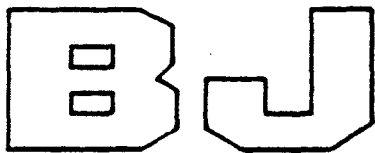
DATE 22 May 1980  
 DST No. 2

ENGR:			FLOWING CONDITIONS					SAMPLES							OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	CHLOR-IDES	BS ↓ W	METERED	SEPARATOR FLOW RATE MSCFD	METERED	GOR
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP											
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	PPM	%	BOPD	MSCFD	BWPD	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2145	36		179	60														
2150										>6%	0							
2200			201	60														
2210												pH=5	48000	97	trace			
2215			191	60														
2217																	432	
2230			179	60						>6%	0	pH=5	35000	97	(2% oil)			
2245			183	60														
2259		Samples No. 4 and 5 taken from separator bypass													36	(some)	324	
2300			180	60								pH=5½	35000	90	(10% oil)			
2313			172	60														

PERFORATED INTERVAL: 9945-9960

REVISED 5/78 Page 6 of 6





# BJ SERVICE B.V.

NORSCO BASE - 4056 TANANGER - NORWAY

TELEPHONE (045) 96 533

TELEX 33245 bjser n

## JOB SUMMARY

Company: Phillips Petroleum Co. Norway date: 22.05.80

Type of job: Stimulation well no.: 2/7-15x

Stimulation Crew: \_\_\_\_\_

1. Treater .... : 0 Stram 2. Engineer ... : G. Frantzen

3. CSB operator : A. Nilsen 4. Pump operator: Hilde

5. Pump operator: B. Jakobsen 6. Helper ..... : \_\_\_\_\_

Pumps used : 4 stk. V-16 Pacemaker pumps

Formation broke at : 5200 psi to 3800 psi

Pressure test to : 7500 psi

Max treating pressure : 5200 psi Min. treating pressure : 3800 psi

Max. injection rate : 10.5 bbls/min. Min injection rate: 3.5 bbls/min

Total fluid pumped : 327 bbls Fluid in formation: 153 bbls

Quantity and type fluids pumped: 71.5 bbls of SAC.

71.5 bbls of ACID EQH 205

+ bbls of DIVERTER

184 bbls of FLUSH

Average pressure increase on diverting stage: \_\_\_\_\_ psi

Maximum pressure increase on diverting stage: \_\_\_\_\_ psi

Minimum pressure increase on diverting stage: \_\_\_\_\_ psi

Instantaneous shut-in-pressure ..... : 3800 psi

Five minute shut-in-pressure ..... : 3680 psi

Started treatment: 16:58 am/pm Finished treatment: 17:48 am/pm

Remarks: 10 min. S.I.P. : 3600 psi 15 min. S.I.P. : 3590 psi

One pump not working properly in the beginning of the job

Repaired during the job.

\_\_\_\_\_

\_\_\_\_\_



**BJ-HUGHES Inc.**  
A SUBSIDIARY OF HUGHES TOOL COMPANY

P.O. BOX 2250 LONG BEACH, CALIFORNIA 90801

**TREATMENT LOG**

Acid Stage No. \_\_\_\_\_

Date 22.5.80 District Tananger F. O. No. \_\_\_\_\_  
 Company Phillips Petroleum Co. Norway  
 Well No. 15 x  
 County Continental Shelf State \_\_\_\_\_  
 Location 2/7 Field Elffisk  
 Casing: Size \_\_\_\_\_ Type & Wt. \_\_\_\_\_ Set at \_\_\_\_\_ ft.  
 Perf. From 9945 ft. to 9960 ft. No. of Perf. 30  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Perf. \_\_\_\_\_  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Perf. \_\_\_\_\_  
 Liner: Size \_\_\_\_\_ Type & Wt. \_\_\_\_\_ Top at \_\_\_\_\_ ft. Bottom at \_\_\_\_\_ ft.  
 Cemented: Yes/No. Perforated From \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 Tubing: Size \_\_\_\_\_ Strung at \_\_\_\_\_ ft.  
 Perforated From 9945 ft. to 9960 ft.  
 Formation: Cretaceous  
 Open Hole Size \_\_\_\_\_ T.D. \_\_\_\_\_ ft. P.B. to \_\_\_\_\_ ft.

Type Treatment: Amt. \_\_\_\_\_ Type Fluid \_\_\_\_\_ Sks. Cement \_\_\_\_\_ Pound of Sand \_\_\_\_\_  
 Breakdown 71.5 Bbl./Gal. SAC  
71.5 Bbl./Gal. EQH 205 Acid  
 \_\_\_\_\_ Bbl./Gal. \_\_\_\_\_  
 \_\_\_\_\_ Bbl./Gal. \_\_\_\_\_  
 Flush 18.4 Bbl./Gal. \_\_\_\_\_  
 Treated From 9945 ft. to 9960 ft. No. ft. 15  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. ft. \_\_\_\_\_  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. ft. \_\_\_\_\_  
 Calculated Volume to: Lead Hole 174 Bbl./Gal. Reach Form. \_\_\_\_\_ Bbl./Gal.  
 Actual Volume of Oil/Water to Lead Hole: \_\_\_\_\_ Bbl./Gal.  
 Pump Trucks Used: 4 stk. V-16 Pacemaker Units  
 Auxiliary Equipment: CSB-20 Blender, Acid pump, Acid tank  
 Packer: \_\_\_\_\_ Set at \_\_\_\_\_ ft.  
 Auxiliary Tools: \_\_\_\_\_  
 Plugging or Sealing Materials: Type & Amt. Divert II Regular  
 SOB (No & Type) \_\_\_\_\_

Company Representative \_\_\_\_\_ Treater \_\_\_\_\_

TIME P.M.	PRESSURES		FLUID PUMPED DATA GAL./BBL.				REMARKS
	TUBING	CASING	TOTAL FLUID PUMPED	FLUID IN FORMATION	PUMPED PER TIME PERIOD	PUMPED PER MIN.	
04:58	1200						Start treatment on SAC
05:15	4400		71.5		71.5	4.2	Off SAC on Acid
05:27	5000		143.0		71.5	6.0	Off Acid on Displacement
05:31	4750		174.0		31.0	7.8	SAC at formation
05:39	4650		246.0	72.0	72.0	9.0	Acid at formation
05:47	5100		317.0	143.0	71.0	8.9	Overflush at formation
05:48	5150		327.0	153.0	10.0	10.0	Stop pumping
05:48	3800						Instantaneous shut in pressure
05:53	3680						5 min. SIP
05:58	3600						10 min. SIP
06:03	3590						15 min. SIP
							NOTE: The readout on the pressure chart is 200 psi lower than the actual pressure was during the treatment.

DST \*3

9886-9916 and 9945-9960 feet RKB.

The Upper Cretaceous was commingled with the Danian for this test. The zone was immediately acidized and broke at 5650 psig. A total of 214 bbls of EQH 205 was pumped at a maximum injection rate of 13.7 bbl/min.

The well was flowed for 13.13 hours on 32/64" choke. Final bottomhole flowing pressure was 3934 psig at 9899 ft RKB. The final rate was 206 BWPD and 84 BOPD.

After 16 hours build up the bottomhole pressure was 6443 psig.



# Flow Test Data Summary

PLATFORM EAST ELDFISK  
HAARON MAGNUS WELL No. 2/7 15 X DATE 26 May 1980

1. Test No. 3 Test Engr. Woodson Test Co. Halliburton

2. Preacid Test , Postacid Test . Acid/Type EOH 205

3. Flow Commenced: Cleanup 10:51 - 24:06 Hrs.; Separator 0 Hrs.

4. Programmed Duration 8 hrs stabilized Hrs. Flowing Duration 13 Hrs.

OIL	GAS	WATER	CHOKE SIZE	Flowing TBG		GOR	BS & W
				Pressure	Temp		
84	Trace	206	32/64	<50	-		71
BPD	MMCFPD	BPD	INCHES	PSIG	F	SCF/BBH	%

GRAVITY		SEPARATOR		DRAEGER TESTS			Total Water Chlorides	Water	
OIL	GAS	PRESS.	TEMP	H <sub>2</sub> S	CO <sub>2</sub>	MERCAPTAN		Resistivity	Temp
				-	1%	-	29,000		
API	S.G.	PSIG	°F	PPM	%	PPM	MG/LITER	OHM-M	°F

Shrinkage Factor:)

7. Remarks: Max recorded BHT = 218°F

Commingled with DST 2 interval

8. Perforated Interval: 9886-9916, 9945-9960

### 9. Bottom Hole Pressures (Field Readings)

Bottom Hole Pressure Periods	Recorder <u>MRPG 0009</u>	Recorder <u>MRPG 0043</u>	Recorder _____	Recorder _____
	Depth <u>9899</u>	Depth <u>9889</u>	Depth _____	Depth _____
Initial Hydrostatic		7442		
1st Flow	3946	3934		
1st Shut in	6724	6443		
2nd Flow				
2nd Shut in				
3rd Flow				
3rd Shut in				
4th Flow				
4th Shut in				
Final Hydrostatic		7426		

10. Distribution: ORIGINAL \_\_\_\_\_, 1 Copy: R.J. Rundt, 1 Copy: G.R. Smith.

WELL NUMBER 2/7 - 15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 25 May 1980  
 DST No. 3

ENGR: AS		FLOWING CONDITIONS						SAMPLES							OIL	GAS	WATER	GOR	
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE	METERED	SCF/bbl	
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP								BOPD	MSCFD	BWPD		
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	mg/l					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1052	32 Fix																		
1055			2927																
1100			2680																
1105			2200'																
1107 - 1117			Flow through measuring tank until 1117. Rate=7315 BPD																
1110			1680																
1115			1070																
1119			First sign of acid water. pH=2.5 - Cum. Flow ≈ 160 Bbls.																
1120			900	Fixed choke was plugged by packer rubber piece.															
1125	0		2680																
1130	32 ADJ		2000	Opened well on 32/64" adjustable choke															
1135			2470	Possible blocking of adj. choke															
1136	46			Increase choke to get rid of blocking.															
1140	32 FIX		980	Changed to 32/64" fixed choke															
1145			700																

PERFORATED INTERVAL: 9945-9960 and 9886-9910

WELL NUMBER 2/7 - 15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 25 May 1980  
 DST No. 3

ENGR: AS		FLOWING CONDITIONS						SAMPLES							OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE MSCFD	METERED	GOR
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP											
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	mg/l	BOPD	MSCFD	BWPD	SCF/bbl
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1150			590															
1155			510								pH=2½							
1200			460															
1215			360	Rate measured in tank							1966 BPD							
1230			310	Trace of oil							pH=4							
1245			269															
1300			232								pH=4½		94					
1315			200															
1330			210	Gas present with CO <sub>2</sub> > 6% pH=5														
1345			179															
1400			180								pH=5							
1415			159										90					
1430			139															
1445			125															
1500			133															

PERFORATED INTERVAL: 9945-9960 9886-9910

REVISED 5/78 Page 2 of 3

WELL NUMBER 2/7-15X  
 WELL NAME East Eldfisk

# Phillips Petroleum Company

DATE 25 May 1980  
 DST No. 3

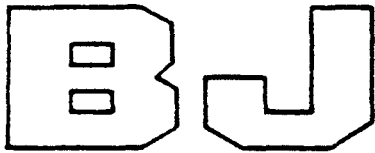
ENGR: AS			FLOWING CONDITIONS					SAMPLES							OIL	GAS	WATER	GOR
TIME	CHOKE SIZE	SEPA-RATOR SAMPLES	WELLHEAD		SEPARATOR			OIL GRAV-ITY	GAS GRAV-ITY	CO <sub>2</sub>	H <sub>2</sub> S	MER-CAP-TANS	BS & W	CHLOR-IDES	METERED	SEPARATOR FLOW RATE	METERED	SCF/bbl
			PRESS	TEMP	PRESS	SHRINK-AGE	OIL TEMP								BOPD	MSCFD	BWPD	
HOURS	64th IN.	TYPE	PSIG	°F	PSIG	FACTOR	°F	°API	S.G.	%	PPM	PPM	%	PPM	BOPD	MSCFD	BWPD	19
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1530	32 FIX		111	Tank	metered			869	BPD		pH=5½		90	41000				
1600			103															
1630			88															
1700			79	Tank	metered			549	BPD		pH=5½		83	42000				
1730			73															
1800			68								pH=6		80	33000				
1830			65															
1900			65								pH=6		82	32000				
1930			60															
2000			55								pH=6		81	32000				
2030			52															
2100			<50	Tank	metered			442	BPD		pH=6		76	32000				
2200			<50	"	"			442	BPD		pH=6		78	30000				
2300			<50	"	"			404	BPD	4%	pH=6½		75	27000				
0000			<50	"	"			290	BPD		pH=7		71	29000				

PERFORATED INTERVAL:

REVISED 6/78 Page 3 of 3

0008

CLOSE APR-N. END OF FLOW



**BJ SERVICE B.V.**

NORSCO BASE - 4056 TANANGER - NORWAY

TELEPHONE (045) 96 533

TELEX 33245 bjsær n

JOB SUMMARY

Company: Phillips Petroleum Co. Norway date: 25.05.80

Type of job: Stimulation well no.: 2/7-15x

Stimulation Crew: \_\_\_\_\_

1. Treater .... : O. Strøm 2. Engineer ... : G. Frantzen

3. CSB operator : A. Nilsen 4. Pump operator: Hilde

5. Pump operator: B. Jakobsen 6. Helper ..... : \_\_\_\_\_

Pumps used : 4 stk. V-16 Pacemaker pumps

Formation broke at : 5650 psi to 5080 psi

Pressure test to : 7870 psi

Max treating pressure : 5940 psi Min. treating pressure : 4090 psi

Max. injection rate : 13.7 bbls/min. Min injection rate: 5.5 bbls/min

Total fluid pumped : 633.0 bbls Fluid in formation: 453 bbls

Quantity and type fluids pumped: 214.3 bbls of SAC.

214.3 bbls of ACID 92-8

14.3 bbls of DIVERTER

190.1 bbls of FLUSH

Average pressure increase on diverting stage: 470 psi

Maximum pressure increase on diverting stage: \_\_\_\_\_ psi

Minimum pressure increase on diverting stage: \_\_\_\_\_ psi

Instantaneous shut-in-pressure ..... : 4030 psi

Five minute shut-in-pressure ..... : 3940

Started treatment: 0938 am/pm Finished treatment: 1032 am/pm

Remarks: Average pumping rate; 11,7 BPM

10 min. S.I.P.: 3910 psi 15 min. S.I.P.: 3910 psi

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





**BJ-HUGHES Inc.**  
A SUBSIDIARY OF HUGHES TOOL COMPANY

P.O. BOX 2250 LONG BEACH, CALIFORNIA 90801

**TREATMENT LOG**

Acid Stage No. \_\_\_\_\_

Date: 25.05.80 District: Tanager F. O. No. \_\_\_\_\_  
 Company: Phillips Petroleum Co. Norway  
 Well No.: 15x  
 County: Continental Shelf State: Norway  
 Location: \_\_\_\_\_ Field: Fldfisk

Type Treatment: Amt. Type Fluid Sls. Cement Pound of Sand  
 Bkdown 214.3 Bbl./Gal. SAC  
214.3 Bbl./Gal. Acid EQH 205  
14.3 Bbl./Gal. Diverter  
 Flush 190.1 Bbl./Gal. \_\_\_\_\_  
 Treated From 9886 ft. to 9916 ft. No. ft. 30  
 From 9945 ft. to 9960 ft. No. ft. 15  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. ft. \_\_\_\_\_

Casing: Size \_\_\_\_\_ Type & Wt. \_\_\_\_\_ Set at \_\_\_\_\_ ft.  
 Perf. From 9886 ft. to 9916 ft. No. of Perf. 60  
 From 9945 ft. to 9960 ft. No. of Perf. 30  
 From \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Perf. \_\_\_\_\_  
 Liner: Size \_\_\_\_\_ Type & Wt. \_\_\_\_\_ Top at \_\_\_\_\_ ft. Bottom at \_\_\_\_\_ ft.  
 Cemented: Yes/No. Perforated From \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 Tubing: Size \_\_\_\_\_ Setting at \_\_\_\_\_ ft.  
 Perforated From 9886-9916 & ft. to 9945-9960 ft.  
 Formation: Upper cretaceous  
 Open Hole Size \_\_\_\_\_ T.D. \_\_\_\_\_ ft. P.B. to \_\_\_\_\_ ft.

Calculated Volume to Load Hole: 180 Bbl./Gal. Reach Form. \_\_\_\_\_ Bbl./Gal.  
 Actual Volume of Oil/Water to Load Hole: \_\_\_\_\_ Bbl./Gal.  
 Pump Trucks Used: 4 stk. V-16 Pacemaker Units  
 Auxiliary Equipment: CSB 20 Blender, Acid pump, Acid tank  
 Packer: \_\_\_\_\_ Set at 9824 ft.  
 Auxiliary Tools: \_\_\_\_\_  
 Plugging or Sealing Materials: Type & Amt. Divert II + Superflake  
 SOB (No & Type) \_\_\_\_\_

Company Representative \_\_\_\_\_ Treater \_\_\_\_\_

TIME A.M./P.M.	PRESSURES		FLUID PUMPED DATA GAL./BBL.				REMARKS
	TUBING	CASING	TOTAL FLUID PUMPED	FLUID IN FORMATION	PUMPED PER TIME PERIOD	PUMPED PER MIN.	
09:09	7870						Start pressure test
09:20	7870						Pressure up Halliburton unit & opens hammer valve between Halliburton and BJ unit.
09:21	0						Stop pressure test
09:32	0						Pressurize to open bottom valve
09:38	1200		0				Start treatment on SAC 1
09:45	5200		71.5		71.5	10.2	Off SAC 1 on Acid 1
09:52	5150		143.0		71.5	10.2	Off Acid 1 on Divert
09:54	4300		157.3	0	14.3	7.1	Off Divert on SAC 2
09:58	4500		180.0	0	22.7	5.7	SAC 1 at formation
10:04	5150		251.5	71.5	71.5	11.9	Acid 1 at formation
10:08	5250		300.3	120.3	48.8	12.2	Off SAC 2 on Acid 2
10:10	5250		323.0	143.0	22.7	11.4	Diverter at formation
10:11	5600		337.0	157.0	14.0	18.0	SAC 2 at formation
10:19	5250		443.0	263.0	106.0	13.3	Off SAC 2 on displacement
10:21	5100		468.0	288.0	25.0	12.5	Pressure increases at the end of SAC 2 stage in the formation. It is likely to believe that this is caused by partial blocking of the tight formation by the SAC.
10:22	5800		480.0	300.0	12.0	12.0	Acid 2 at formation
10:33	5550		633.0	453.0	153.0	13.9	Stop treatment
10:33	4030						Instantaneous shut in pressure
10:38	3940						5 min. SIP
10:43	3910						10 min. SIP
10:48	3910						15 min. SIP

# OILFIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(TOTAL WELL)

OPERATOR: Phillips Petroleum Company Norway WELL: Ekofisk 2/7-15X T.D. 14,510 Ft. (RKB)  
 DATE OF SPUD: January 29, 1980, DATE OF T.D. May 2, 1980, DATE RIG REL: May 29, 1980  
 DAYS (SPUD TO T.D.): 95, TOTAL DAYS (SPUD TO RREL): 122  
 RKB TO SEABED: 309 Ft., WATER DEPTH: 227 Ft., TOTAL DRILLED Ft.: 14,201 Ft.  
 TOTAL ROTATING HOURS (DRLG + REAMING): 649, TOTAL BIT RUNS: 27

CASING SIZE:	30"	20"	13½"	9½"	7"
CASING DEPTH (RKB):	503 Ft.	1,604 Ft.	4,485 Ft.	10,416 Ft.	12,108 Ft.
HOLE SIZE:	36"	26"	17½"	12½"	8½"
HOLE DEPTH (RKB):	503 Ft.	1,650 Ft.	4,550 Ft.	10,450 Ft.	12,135 Ft.

### MUD PRODUCTS USED

PRODUCT	UNIT SIZE	UNIT COST	TOTAL UNITS	TOTAL COST (\$)	% OF TOTAL COST
Barite	100 lb	5.25	48,245	253,286	68
Drispac S/L	50 lb	140.00	166	23,240	6
Soltex	50 lb	45.00	459	20,655	5
Lignosulfonate	25 kg	15.00	1,274	19,110	5
Drispac Regular	50 lb	130.00	132	17,160	5
Bentonite	50 kg	12.50	1,156	14,450	4
DESCO	50 lb	26.00	348	9,048	3
Caustic	25 kg	10.50	529	5,554	1.49
Mica	25 kg	11.97	289	3,459	.93
Flosal	50 lb	16.55	113	1,870	.50
Diaceal D	50 lb	23.30	64	1,491	.40
Chrome Lignite	25 kg	20.00	61	1,220	.37
Nut Plug	25 kg	12.64	91	1,150	.31
Thin	50 lb	20.00	6	120	.03
Lime	25 kg	4.25	9	38	.01
Bicarbonate Soda	50 kg	16.50	4	66	.01

TOTAL MUD COST: (\$) 371,919

TOTAL MUD, COST/Ft (\$) 25.63 TOTAL MUD, COST/DAY (\$) 3,074

REMARKS:

# OILFIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(BY INTERVAL)

OPERATOR: Phillips Petroleum Company Norway WELL: Ekofisk 2/7-15X  
 INTERVAL: From: Sea Bed To: 503 Ft. (RKB)  
 TOTAL INTERVAL Ft: 503, TOTAL DRILLED Ft: 194, TOTAL BIT RUNS: 1  
 TOTAL ROTATING HOURS (DRLG + REAMING): 10.5, TOTAL BIT RUNS: 1  
 CSG. SIZE: 30" & DEPTH 503 Ft. (RKB), HOLE SIZE: 36" & DEPTH: 503 Ft. (RKB)

### MUD PRODUCTS USED

<u>PRODUCT</u>	<u>UNIT SIZE</u>	<u>UNIT COST</u>	<u>TOTAL UNITS</u>	<u>TOTAL COST (\$)</u>	<u>% OF TOTAL COST</u>
Bentonite	50 kg	12.50	180	2250	74
Flosal	50 lb	16.55	45	744	24
Caustic	25 kg	10.50	6	63	2

INTERVAL MUD COST: (\$) 3,058

INTERVAL MUD, COST/Ft: (\$) 6.08 INTERVAL MUD, COST/DAY: (\$) 3,058

REMARKS: Drilled with 26" bit and 36" H.O. in seawater spotting gel slugs.  
Spotted 250 bbls mud. Pull up and take survey (1<sup>0</sup>). Flushed hole with  
450 bbls mud. Run 30" casing. Had to wash 30" casing to bottom.

# OILFIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(BY INTERVAL)

OPERATOR: Phillips Petroleum Company Norway WELL: Ekofisk 2/7-15X  
 INTERVAL: From: 503 Ft. To: 1,650 Ft. (RKB)  
 TOTAL INTERVAL Ft: 1,147 , TOTAL DRILLED Ft: 1,147 , TOTAL BIT RUNS: 2  
 TOTAL ROTATING HOURS (DRLG + REAMING): 20.5 , TOTAL BIT RUNS: 2  
 CSG. SIZE: 20" & DEPTH 1,604 Ft. (RKB), HOLE SIZE: 26" & DEPTH: 1,650 Ft. (RKB)

### MUD PRODUCTS USED

<u>PRODUCT</u>	<u>UNIT SIZE</u>	<u>UNIT COST</u>	<u>TOTAL UNITS</u>	<u>TOTAL COST (\$)</u>	<u>% OF TOTAL COST</u>
Bentonite	50 kg	12.50	220	2,750	73
Flosal	50 lb	16.55	55	910	24
Caustic	25 kg	10.50	8	84	2
Lime	25 kg	4.25	5	21	1

INTERVAL MUD COST: (\$) 3,766

INTERVAL MUD, COST/Ft: (\$) 3.28 INTERVAL MUD, COST/DAY: (\$) 1,255

REMARKS: Drill 17 1/2" pilot hole with native seawater, spotting mud when needed.  
Spotted 200 bbls. Opened hole up to 26" and spotted 850 bbls. Run and  
cemented 20" casing. Days on interval -3.

**OILFIELD CONSULTANTS INTERNATIONAL**  
**DRILLING MUD RECAP**

(BY INTERVAL)

OPERATOR: Phillips Petroleum Company Norway WELL: Ekofisk 2/7-15X  
 INTERVAL: From: 1,650 Ft. To: 4,550 Ft. (RKB)  
 TOTAL INTERVAL Ft: 2,900 , TOTAL DRILLED Ft: 2,900 , TOTAL BIT RUNS: 2  
 TOTAL ROTATING HOURS (DRLG + REAMING): 31.0 , TOTAL BIT RUNS: 2  
 CSG. SIZE: 13 3/8" & DEPTH 4,485 Ft. (RKB), HOLE SIZE: 17 1/2" & DEPTH: 4,550 Ft. (RKB)

MUD PRODUCTS USED

<u>PRODUCT</u>	<u>UNIT SIZE</u>	<u>UNIT COST</u>	<u>TOTAL UNITS</u>	<u>TOTAL COST (\$)</u>	<u>% OF TOTAL COST</u>
Drispac Regular	50 lb	130.00	7	910	55
DESCO	50 lb	26.00	13	338	20
Flosal	50 lb	16.55	13	215	13
Caustic	25 kg	10.50	12	126	7
Nut Plug	25 kg	12.64	5	63	5

INTERVAL MUD COST: (\$) 1,652

INTERVAL MUD, COST/Ft: (\$) 0.57 INTERVAL MUD, COST/DAY: (\$) 236

REMARKS: Drilled with seawater. Added Flosal for viscosity when needed. Drispac Regular and Caustic put into system when popoff valve blew. Days on interval - 7 days.

# OILFIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(BY INTERVAL)

OPERATOR: Phillips Petroleum Company Norway WELL: Ekofisk 2/7-15X  
 INTERVAL: From: 4,550 Ft. To: 10,450 Ft. (RKB)  
 TOTAL INTERVAL Ft: 5,900 , TOTAL DRILLED Ft: 5,900 , TOTAL BIT RUNS: 4  
 TOTAL ROTATING HOURS (DRLG + REAMING): 154.5 , TOTAL BIT RUNS: 4  
 CSG. SIZE: 9½" & DEPTH 10,416 Ft. (RKB), HOLE SIZE: 12½" & DEPTH: 10,450 Ft. (RKB)

### MUD PRODUCTS USED

PRODUCT	UNIT SIZE	UNIT COST	TOTAL UNITS	TOTAL COST (\$)	% OF TOTAL COST
Barite	100 lb	5.25	16,566	86,971	63
Soltex	50 lb	45.00	296	13,320	9
Lignosulfonate	25 kg	15.00	779	11,685	8
Drispac S/L	50 lb	140.00	68	9,520	7
Drispac Regular	50 lb	130.00	50	6,500	5
DESCO	50 lb	26.00	221	5,746	4
Caustic	25 kg	10.50	292	3,066	2
Bentonite	50 kg	12.50	117	1,462	1
Mica	25 kg	11.97	21	251	-
Thin	50 lb	20.00	6	120	-
Bicarbonate Soda	50 kg	16.50	4	66	-

INTERVAL MUD COST: (\$) 138,708

INTERVAL MUD, COST/Ft: (\$) 23.50 INTERVAL MUD, COST/DAY: (\$) 6,935

REMARKS: Drilled 12½" hole. Ran 9½" casing - time on interval - 20 days.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# OILFIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(BY INTERVAL)

OPERATOR: Phillips Petroleum Company Norway WELL: Ekofisk 2/7-15X  
 INTERVAL: From: 10,450 Ft. To: 12,135 Ft. (RKB)  
 TOTAL INTERVAL Ft: 1,685 , TOTAL DRILLED Ft: 1,685 , TOTAL BIT RUNS: 8  
 TOTAL ROTATING HOURS (DRLG + REAMING): 121 , TOTAL BIT RUNS: 8  
 CSG. SIZE: 7" & DEPTH 12,108 Ft. (RKB), HOLE SIZE: 8½" & DEPTH: 12,135 Ft. (RKB)

### MUD PRODUCTS USED

<u>PRODUCT</u>	<u>UNIT SIZE</u>	<u>UNIT COST</u>	<u>TOTAL UNITS</u>	<u>TOTAL COST (\$)</u>	<u>% OF TOTAL COST</u>
Barite	100 lb	5.25	19,504	102,396	76
Drispac Regular	50 lb	130.00	61	7,930	6
Soltex	50 lb	45.00	134	6,030	4
Drispac S/L	50 lb	140.00	40	5,600	4
Bentonite	50 kg	12.50	260	3,250	2
Mica	25 kg	11.97	263	3,148	2
Lignosulfonate	25 kg	15.00	171	2,565	2
Diaceal D	50 lb	23.30	64	1,491	1
Nut Plug	25 kg	12.64	76	960	1
Caustic	25 kg	10.50	85	892	1
DESCO	50 lb	26.00	30	780	1
Chrome Lignite	50 lb	20.00	5	100	-
Lime	25 kg	4.25	4	17	-

INTERVAL MUD COST: (\$) 135,160

INTERVAL MUD. COST/Ft: (\$) 80.21 INTERVAL MUD. COST/DAY: (\$) 4,224

REMARKS: Drilled 8½" hole. Took kick at 12,030 Ft. Raised weight to 16.2 and lost circulation. Got circulation back and controlled well. Maintained 16.2 until 7" liner set. Time on interval - 32 days.

# OILFIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(BY INTERVAL)

OPERATOR: Phillips Petroleum Company Norway WELL: Ekofisk 2/7-15X  
 INTERVAL: From: 12,135 Ft. To: 14,510 Ft. (RKB)  
 TOTAL INTERVAL Ft: 2,375 , TOTAL DRILLED Ft: 2,375 , TOTAL BIT RUNS: 8  
 TOTAL ROTATING HOURS (DRLG + REAMING): 211.5 , TOTAL BIT RUNS: 8  
 CSG. SIZE: None & DEPTH - (RKB), HOLE SIZE: 5 7/8" & DEPTH: 14,510 Ft. (RKB)

### MUD PRODUCTS USED

<u>PRODUCT</u>	<u>UNIT SIZE</u>	<u>UNIT COST</u>	<u>TOTAL UNITS</u>	<u>TOTAL COST (\$)</u>	<u>% OF TOTAL COST</u>
Barite	100 lb	5.25	8,869	46,562	77
Drispac S/L	50 lb	140.00	30	4,200	7
Lignosulfonate	25 kg	15.00	243	3,645	7
Drispac Regular	50 lb	130.00	12	1,560	3
Bentonite	50 kg	12.50	121	1,512	3
DESCO	50 lb	26.00	84	2,184	3
Caustic	25 kg	10.50	54	567	-

INTERVAL MUD COST: (\$) 60,231

INTERVAL MUD, COST/Ft: (\$) 25.36 INTERVAL MUD, COST/DAY: (\$) 1,825

REMARKS: After milling junk - drilled 5 7/8" hole. Ran turbine and diamond bit.  
Maintain mud weight from 15.9 - 16.1. No casing set here. Interval  
took 33 days.



# OILFIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(BY INTERVAL)

OPERATOR: Phillips Petroleum Company Norway WELL: Ekofisk 2/7-15X  
 INTERVAL: From: Logging To: Testing (RKB)  
 TOTAL INTERVAL Ft: -, TOTAL DRILLED Ft: -, TOTAL BIT RUNS: 2  
 TOTAL ROTATING HOURS (DRLG + REAMING): -, TOTAL BIT RUNS: 2  
 CSG. SIZE: - & DEPTH - (RKB), HOLE SIZE: - & DEPTH: - (RKB)

### MUD PRODUCTS USED

<u>PRODUCT</u>	<u>UNIT SIZE</u>	<u>UNIT COST</u>	<u>TOTAL UNITS</u>	<u>TOTAL COST (\$)</u>	<u>% OF TOTAL COST</u>
Barite	100 lb	5.25	3,306	17,356	60
Drispac S/L	50 lb	140.00	28	3,920	13
Bentonite	50 kg	12.50	258	3,225	11
Chrome Lignite	50 lb	20.00	56	1,120	4
Lignosulfonate	25 kg	15.00	81	1,215	4
Soltex	50 lb	45.00	29	1,305	4
Caustic	25 kg	10.50	72	756	3
Drispac Regular	50 lb	130.00	2	260	-
Nut Plug	25 kg	12.64	10	126	-
Mica	25 kg	11.97	5	60	-

INTERVAL MUD COST: (\$) 29,344

INTERVAL MUD, COST/Ft: (\$) N/A INTERVAL MUD, COST/DAY: (\$) 1,129

REMARKS: Logging and Testing.

Days on interval - 26 days.

# OILFIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(MUD PROPERTIES)

OPERATOR: Phillips Petroleum Company Norway CONTRACTOR: DOLPHIN SERVICES RIG NO: HARKONMAGNUS WELL NAME: 2/7-15X  
 LOCATION: EAST ELDFISK LEGAL DESCRIPTION: \_\_\_\_\_

DATE (1980)	TIME	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY (Sec/Oil)		PLASTIC VISCOSITY		YIELD POINT (lb/100 ft <sup>3</sup> )	GELS (lb/100 ft <sup>3</sup> )	pH	FILTRATE (ml/30 min)			Coke (32nd in)	Alkalinity		Chloride (ppm)	Total Hardness (ppm)	Calcium (ppm)	Magnesium (ppm)	Sand (% by Vol.)	Solids (% by Vol.)	OH (% by Vol.)	MBT (me/ml mud)	BS/OS Ratio	Circ. Volume (bbls)	REMARKS
				API#	°F	cp	°F				API	HPHT	°F		P <sub>m</sub>	P <sub>f</sub> /M <sub>f</sub>											
JAN 28	2330		8.5	100 <sup>+</sup>																					900	MIXED SPUD MUD	
JAN 29	2330	503	8.5	100 <sup>+</sup>																					900	SPUD WELL	
JAN 30	2200	755	8.5	100 <sup>+</sup>																					605	Jet 1st. CMT. DRILL	
JAN 31	2330	1650	8.5	100 <sup>+</sup>																					630	DRILL	
FEB 1	1200	1650	8.5	100 <sup>+</sup>																					903	RUN 20"	
2		1650	NONE																						570	RUN 50 P.S.	
3		1650	8.5	SEAWATER				NATIVE																	675	DRILL CMT.	
4	1600	3325	10	40	3	11	3/10																		1471	DRILL 17 1/2"	
5	0300	4130	10.2	42	7	38	8/15																		1704	" "	
6	1900	4550	10.3	43	8	38	9/20																		1811	" "	
7	2400	4550	10.3	40	8	36	8/17										18,000								1811	Logging	
8	1800	4550	10.3	40	8	36	8/17										18,000								1851	" "	
9	0600	4550	10.3	40	8	36	8/17										18,000								1851	RUN 13 3/4"	
10	1100	4550	12.5	74	54	31	6/11	11.0	5.2	17.6	250	1	3.1	1 1/2	15,000		160				24			1115	Cement		
11	0510	4550	12.5	63	40	22	6/9	11.0	5.0	17.6	250	1	3.2	1 1/2	15,000		120				24			1212	SUCCESS		
12	0300	4945	14.5	58	45	28	3/7	11.5	6.4	12.2	250	2	3.2	1 1/2	15,000		Nil				1/4	27			1322	Leak along Dalg. Ann.	
13	2210	5810	14.6	54	33	22	3/18	11.5	6.2	-	-	2	3.0	1 1/2	15,000		Nil				2	28			1310	DRILL 12 1/4"	
14	2400	6857	14.7	54	34	18	4/30	10.5	6.8	-	-	2	-	1 1/2	16,000		400				2	28			1421	" "	
15	1100	7310	15.0	60	36	27	9/48	10.0	6.2	-	-	2	1.2	1 1/2	15,000		440				2	29			1656	" "	
16	1350	7990	14.7	70	36	29	12/60	9.0	6.1	-	-	2	1.2	1 1/2	15,000		700				2 1/2	28			1866	" "	
17	0330	9100	14.5	59	34	32	8/36	10.5	6.0	-	-	2	1.6	1 1/2	17,000		200				1 1/2	28			1924	" "	

O.C.I. CONSULTANT REPRESENTATIVES Jim SAXON / Jim GRAY

FIELD CONSULTANTS INTERNATIONAL

DRILLING MUD RECAP

(MUD PROPERTIES)

OPERATOR: Phillips Petroleum Company Norway CONTRACTOR: Dolphin Services RIG NO.: HAARON MAGNUS WELL NAME: 2/7-15x  
 LOCATION: East Eldfisk LEGAL DESCRIPTION: \_\_\_\_\_

DATE (1980)	TIME	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY (Sec/Oil)		PLASTIC VISCOSITY		YIELD POINT (lb/100 ft <sup>2</sup> )	GELS (lb/100 ft <sup>3</sup> ) 0/10	pH	FILTRATE (ml/30 min)			Coke (32nd In)	Alkalinity		Chloride (ppm)	Total Hardness (ppm)	Calcium (ppm)	Magnesium (ppm)	Sand (% by Vol.)	Solids (% by Vol.)	OH (% by Vol.)	MBT (me/ml mud)	BS/OS Ratio	Circ. Volume (bbbls)	REMARKS
				API <sup>6</sup>	°F	CP	°F				API	HPHT	°F		P <sub>m</sub>	P <sub>f</sub> /M <sub>f</sub>											
Feb. 18	1300	9350	14.3	72		44	150	30	8/35	10.5	5.8	-	-	1	2.9	1.3/5.8	16,000	-	150	-	1 1/2	26	-	-	-	1767	Daly. 12 1/4"
19	0200	9505	14.3	66		42	"	28	10/42	10.5	4.8	-	-	1	2.8	1.2/5.4	16,000	-	150	-	1	26	-	-	-	1997	Fishing
20	2230	9505	14.3	68		42	"	30	9/42	10.5	5.0	-	-	1	2.6	1.1/3.2	16,000	-	120	-	1	26	-	-	-	2087	Test Stack
21	2400	9863	14.3	58		40	"	24	6/32	11.0	5.2	-	-	1	2.0	1.0/3.1	16,000	-	200	-	1	27	-	25 <sup>th</sup>	-	1999	Daly. 12 1/4"
22	2100	10,222	14.3	56		35	"	29	6/21	10.5	4.0	10.5	250	1	2.1	1.1/3.7	16,000	-	150	-	2	26	-	25	-	2002	" "
23	2130	10,400	14.3	54		32	"	26	6/22	10.6	4.6	17.2	"	1	2.4	1.1/3.6	14,500	-	150	-	1 1/2	26	-	25	-	1992	" "
24	1100	10,450	14.3	56		33	"	24	5/20	10.5	4.6	18.0	"	1	2.2	1.1/3.2	14,500	-	150	-	1	27	-	25	-	1935	R.O.N. to Log
25	2000	10,450	14.3	58		27	"	19	5/17	10.0	5.0	18.0	"	1	2.0	1.1/3.5	16,000	-	180	-	1	27	-	25	-	1895	Logging
26	2200	10,450	14.3	52		28	"	16	4/16	10.0	5.0	18.6	"	1	2.0	1.1/3.0	16,000	-	200	-	1	27	-	25	-	1945	Logging
27	2100	10,450	14.3	52		28	"	15	4/16	10.0	5.0	18.6	"	1	1.9	1.1/2.8	16,000	-	200	-	1	27	-	25	-	2005	Rig Up 9 3/4" R.O.N. Cement 9 5/8" Csg.
28	1200	10,450	14.3	48		28	"	19	4/13	10.0	4.6	18.6	"	1	2.0	1.1/2.8	16,000	-	200	-	1/2	27	-	25	-	1355	Stack Run Tool
29	0200	10,450	14.3	62		30	"	22	6/20	10.0	4.6	18.6	"	1	2.0	1.1/2.8	16,000	-	200	-	1/2	27	-	25	-	1355	Stack Run Tool
MAR. 1	2900	10,450	14.3	62		30	"	22	6/20	10.0	4.6	18.6	"	1	2.0	1.1/2.8	16,000	-	200	-	1/2	27	-	25	-	1293	Fishing
2	0900	10,450	14.3	44		18	"	12	3/12	10.5	4.9	17.0	"	1	2.6	1.1/3.0	16,000	-	280	-	1/4	27	-	20	-	1145	Fishing
3	1500	10,570	14.3	47		24	"	16	3/13	10.5	4.4	17	"	1	2.4	1.1/2.7	16,000	-	280	-	1/4	27	-	20	-	1165	Run Junk BRACKET
4	1330	10,450	14.5	46		30	"	15	3/12	10.3	4.6	17.5	"	1	2.1	1.1/2.7	16,000	-	250	-	1/4	28	-	20	-	1167	Drill
5	0300	10,575	14.5	56		27	"	10	3/18	10.8	5.2	17	"	1.5	2.5	1.1/2.5	18,000	-	225	-	TR	27	-	22	-	1175	DRLG
6	1500	10,823	14.3	50		23	"	11	3/14	10.5	5.2	17.3	"	1	2.6	1.1/2.2	18,000	-	250	-	TR	22	-	20	-	1222	DRLG
7	2000	11,135	14.0	54		22	"	11	3 1/4	10.5	5.6	17.5	"	1.5	2.5	1.1/2.5	18,500	-	210	-	TR	24	-	22	-	1269	DRLG
8	2300	11,254	14.0	56		22	"	12	2 1/2	10.3	5.6	17.2	"	1	2.3	1.1/2.2	18,000	-	200	-	TR	25	-	24	-	1277	DRLG
9	1430	11,425	14.0	47		20	"	14	2 1/2	10	6	17.5	"	1	2.4	1.1/2.8	17,500	-	175	-	TR	24	-	20	-	1314	DRLG

O.C.I. CONSULTANT REPRESENTATIVES Jim Saxon / Jim Bray

C FIELD CONSULTANTS INTERNATIONAL

DRILLING MUD RECAP

(MUD PROPERTIES)

OPERATOR: Phillips Petroleum Company Norway CONTRACTOR: Dolphin Services RIG NO.: Harmon Magnus WELL NAME: 2/7-15X  
 LOCATION: EAST ELOFISK LEGAL DESCRIPTION: \_\_\_\_\_

DATE (1989) MAR	TIME	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY (Sec/Oil)		PLASTIC VISCOSITY		YIELD POINT (lb/ 100 ft <sup>3</sup> )	GELS (lb/ 100 ft <sup>3</sup> ) 0/10	DH	FILTRATE (ml/30 min)			Cake (32nd in)	Alkalinity		Chloride (ppm) X1000	Total Hardness (ppm)	Calcium (ppm)	Drill Magnesium (ppm) ppm	Sand (% by Vol.)	Solids (% by Vol.)	OH (% by Vol.)	MBT (me/ml mud)	BS/OS Ratio /	Circ. Volume (bbls)	REMARKS
				API	°F	cp	°F				API	HPHT	°F		P <sub>m</sub>	P <sub>10</sub>											
10	1700	11459	14.4	55	23	150	12	3/14	10.8	5.4	12.6	250	1	2.8	1.5	17	150	2+	TR	27	-	20	-	1117	CORE		
11	1600	11471	14.4	51	112	23	11	3/14	10.5	5.4	12.8	"	1	2.5	1.5	16	150	2+	TR	27.5	-	22	-	1178	CORE		
12	1100	11514	14.4	52	102	21	10	3/12	10	5.4	12.2	"	1	2.3	1.5	16	125	2+	TR	26	-	20	-	1322	CORE		
13	1100	11562	14.6	54	88	24	10	3/16	10.6	5.2	12.2	"	1	2.7	1.5	16	125	2+	TR	27	-	22	-	1326	CORE		
14	1030	11602	14.6	56	90	23	12	3/18	10.5	5.4	12.5	"	1	2.5	1.5	16	125	2+	TR	27	-	20	-	1330	REAM OUT CORE AREA		
15	1300	11663	14.6	50	102	22	10	3/12	10.8	4.8	17	"	1	2.8	1.5	16	125	2+	TR	26	-	20	-	1384	CORE		
16	2330	11837	14.8	58	115	26	12	3/16	10.8	5.2	12.2	4	1	3	1.5	15.5	125	2+	TR	28	-	22	-	1398	DRLG		
17	0300	12033	14.8	55	117	24	12	3/18	10.8	5	12.6	"	1	2.9	1.5	15.5	125	2+	TR	28	-	20	-	1462	DRLG (KICK)		
18	0300	12037																								KILL	
19	0300	12033	16.2																							KILL	
20	2330	12033	16.2	57	67	25	10	3/20	9	6	18.5	4	2	1.8	1.5	12	80	2+	TR	28	-	22		1312	KILL WELL		
21	0200	12033	16.2	54	-	24	10	3/16	9.2	5.8	18.2	4	2	2.0	1.5	12	80	2+	TR	27		22		1312	CIRCULATE		
22	1100	12083	16.2	54	-	23	11	3/14	10.8	5.4	17.5	4	2	2.8	1.5	11.5	80	2+	TR	27		20		1316	DRLG		
23	1830	12083	16.2	54	-	25	10	3/16	10.5	5.6	17.2	"	1	2.8	1.5	12	80	2+	TR	28		20		1316	LOG		
24	1500	12083	16.2	52	-	24	11	3/16	10.5	5.6	17.5	"	1	2.8	1.5	12	80	2+	TR	28		20		1316	LOG		
25	0600	12085	16.2	55			10	3/17	10.5	5.2	17.5	"	1	2.8	1.5	12	80	2+	TR	28		20		1316	DRLG PLUS NODDLES		
26	2200	12135	16.2	57	85	24	12	3/18	10.5	5	17	"	1	2.8	1.5	11.5	80	2+	TR	28		22		1320	DRLG		
27	0200	12135	16.2	58	-	25	12	3/18	10.5	4.8	17	"	1	2.8	1.5	12	80	2+	TR	28		24		1320	LOG		
28	1800	12135	16.2	60	-	30	15	4/22	10.5	4.8	17.8	"	1	2.8	1.5	11.5	80	2+	TR	29		24		1320	FISHING		
29	2000	12135	16.2	60	-	28	13	3/18	10.5	4.8	17.7	"	1	2.8	1.5	12	80	2+	TR	29		24		1320	LOG		
30	1300	12135	16.2	59	-	23	12	3/16	10	6	18	"	2	2.4	1.5	12	80	2+	TR	26		20		1320	CIRCULATE TO FWD 7H		

O.C.I. CONSULTANT REPRESENTATIVES Jim Saxon / Jim Brady

# OILFIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(MUD PROPERTIES)

OPERATOR: Phillips Petroleum Company Norway CONTRACTOR: Dolphin Services RIG NO.: Haakon Magnus WELL NAME: 2/7-15x  
 LOCATION: East Eldfisk LEGAL DESCRIPTION: \_\_\_\_\_

DATE (198 <sup>r</sup> )	TIME	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY (Sec/Oil)		PLASTIC VISCOSITY		YIELD POINT (lb/100 ft <sup>3</sup> )	GELS (lb/100 ft <sup>3</sup> )	PH	FILTRATE (ml/30 min)			Cake (32nd in)	Alkalinity		Chloride (ppm)	Total Hardness (ppm)	Calcium (ppm)	Magnesium (ppm)	Sand (% by Vol.)	Solids (% by Vol.)	Oil (% by Vol.)	MBT (me/ml mud)	BS/OS Ratio /	Circ. Volume (bbbls)	REMARKS
				API#	°F	CP	°F				API	HPHT	°F		P <sub>m</sub>	P <sub>1/M</sub>											
MAR 31	1500	12135	16.2	54		23		11	3/15	10.0	5.8	17.8	250	2	2.4	3/1.6	12,000		80		1/4	22	6	20		1297	Run 7'
APR 1	2400	12135	16.2	54		23		11	3/15	10.0	5.8	17.8	"	2	2.4	3/1.6	12,000		80		1/4	22	6	20		1297	Cement
2	1500	12135	16.2	54		24		12	4/16	10.5	5.6	18.0	"	2	2.4	4/1.6	12,000		80		1/4	28	6	20		1526	Dalg. Cmt.
3	1900	12135	16.2	58		26		13	4/17	10.5	6.0	18.0	"	2	2.8	6/1.8	12,000		200		1/2	29	6	20		1526	Test Csq.
4	1300	12135	16.2	58		26		13	4/17	10.5	6.0	18.0	"	2	2.8	6/1.8	12,000		200		1/2	29	6	20		1526	Avak on B.O.P.
5	1800	12160	16.2	56		32		14	4/18	10.0	6.4	18.4	"	2	2.4	3/1.4	11,000		240		1/2	30	5	20		1526	Leakoff 18.3
6	2100	12179	16.2	52		30		14	4/15	10.0	5.6	17.6	"	2	2.4	4/1.6	10,000		280		1/4	30	5	20		1579	Dalg. 5 3/8"
7	0700	12240	16.2	56		31		15	4/15	10.5	5.2	17.6	"	2	2.5	4/1.6	11,000		280		1/4	30	5	20		1555	Dalg.
8	0400	12,353	16.2	70		32		18	4/15	11.5	4.0	17.6	"	2	3.2	8/2.0	10,000		200		1/4	30	5	22 1/2		1554	Mill on Junk
9	2130	12,355	16.2	62		34		16	4/16	11.5	4.4	17.2	"	2	3.0	7/1.9	11,000		200		1/4	30	5	22 1/2		1554	" "
10	2130	12,355	16.2	64		34		18	4/16	11.5	4.4	17.2	"	2	2.8	7/1.9	11,000		200		1/4	30	5	22 1/2		1554	Test B.O.P.'s
11	1600	12,374	16.2	59		32		16	4/15	11.5	4.8	18.0	"	2	2.6	6/1.7	11,000		200		1/4	30	5	22 1/2		1554	Dalg. on Junk
12	2100	12,400	16.2	48		30		12	4/14	11.5	4.0	18.0	"	2	2.8	8/1.9	15,000		240		1/4	30	5	25		1556	Dalg. 5 3/8"
13	2200	12,578	16.2	58		34		18	4/17	10.5	4.0	18.8	"	2	2.4	6/1.7	11,000		160		1/4	30	5	25		1561	" "
14	1200	12,664	16.2	52		34		16	4/15	10.5	4.2	16.8	"	2	2.4	6/1.7	11,000		160		1/4	30	5	25		1563	" "
15	2400	12,797	16.2	58		36		18	4/16	10.5	4.4	16.8	"	2	2.2	8/1.5	11,000		240		1/4	30	5	25		1596	" "
16	2400	12,974	16.2	53		34		18	4/17	11.5	4.0	16.4	"	2	2.5	7/1.9	10,500		240		Ta	29	5	25		1602	" "
17	1600	13,100	16.2	58		38		20	4/16	11.5	4.0	16.2	"	2	2.4	7/1.8	10,000		200		Ta	29	5	25		1605	" "
18	2400	13,213	16.3	62		40		24	4/14	11.5	4.4	17.2	"	2	2.8	8/2.0	10,000		200		Ta	30	5	25		1519	" "
19	0900	13,214	16.3	62		40		24	4/14	11.5	4.4	17.2	"	2	2.7	8/2.0	10,000		200		Ta	30	5	25		1519	W.O.W.
20	2300	13,214	16.2	62		42		26	4/14	11.5	4.4	17.2	"	2	2.6	8/1.9	10,000		200		Ta	30	5	25		1379	W.O.W.

O.C.I. CONSULTANT REPRESENTATIVES JIM SEXON / JIM BRAY

# OIL FIELD CONSULTANTS INTERNATIONAL

## DRILLING MUD RECAP

(MUD PROPERTIES)

OPERATOR: Phillips Petroleum Company Norway CONTRACTOR: Dolphin Services RIG NO.: Arakon MAGNUS WELL NAME: 2/7-15X  
 LOCATION: East Eldfisk LEGAL DESCRIPTION: \_\_\_\_\_

DATE (1986)	TIME	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY (Sec/Oil)		PLASTIC VISCOSITY		YIELD POINT (lb/100 ft <sup>2</sup> )	GELS (lb/100 ft <sup>3</sup> ) 0/10	pH	FILTRATE (ml/30 min)			Cake (32nd in)	Alkalinity		Chloride (ppm)	Total Hardness (ppm)	Calcium (ppm)	Magnesium (ppm)	Sand (% by Vol.)	Solids (% by Vol.)	OR (% by Vol.)	MBT (me/ml mud)	BS/DS Ratio	Circ. Volume (bbls)	REMARKS
				API	°F	cp	°F				API	HPHT	°F		P <sub>m</sub>	P <sub>f</sub> /M <sub>f</sub>											
21	1630	13,214	16.2	70	44	150	26	4/15	11.5	4.0	17.2	250	2	2.6	8/1.7	10,000	240	240		Ta	30	5	25		1505	Core	
22	1930	13,253	16.2	60	42	"	22	4/14	11.5	4.0	17.2	"	2	2.4	7/1.6	10,000	240	240		Ta	30	5	25		1313	Full Riser	
23	2100	13,257	16.2	60	42	"	22	4/14	11.5	4.0	17.2	"	2	2.4	7/1.6	10,000	-	240		Ta	30	5	25		1313	Repsin Riser	
24	2200	13,270	16.2	58	46	"	24	4/14	11.5	4.2	16.4	"	2	2.3	7/1.5	10,000	-	240		Ta	30	4	25		1505	Trlg. 5 3/8"	
25	1000	13,350	16.1	68	49	"	24	4/15	11.0	5.2	16.8	"	2	2.4	7/1.6	10,000	-	200		Ta	30	4	25		1510	" "	
26	1400	13,645	15.9	51	34	"	24	4/12	11.0	4.2	16.8	"	2	2.4	7/1.6	10,000	-	200		Ta	30	3	25		1521	" "	
27	1600	13,741	16.0	50	36	"	20	4/12	11.0	4.6	16.8	"	2	2.2	6/1.4	10,000	-	200		Ta	30	3	22 1/2		1518	" "	
28	1200	13,902	16.1	50	34	"	22	4/12	11.0	5.0	17.2	"	2	2.2	5/1.1	10,000	-	340		Ta	30	3	22 1/2		1521	" "	
29	1900	14,235	16.1	55	26	"	12	3.5/1.5	11	5.2	17.2	"	2	2.6	7/1	10,000	-	340		Ta	28	3	22 1/2		1551	" "	
30	0200	14,253	16.1	54	27	"	10	3/1.3	11	5.2	17.5	"	1	2.8	7/1	10,500	-	200		Ta	28	3	22 1/2		1551	" "	
MAY 1	1500	14,350	16.1	54	28	"	8	3/1.1	9.5	6.5	17.8	"	2	2.2	4/1.1	13,500	-	200		Ta	24	3	20		1560	" "	
2	1400	14,510	16.1	60	25	"	10	3.5/1.6	11	5	17.5	"	2	3	17/1.7	14,000	-	180		Ta	29	2	20		1568	" "	
3	0200	14,510	16.1	60	25	"	10	3.5/1.6	11	5	17.5	"	2	3	17/1.7	14,000	-	180		Ta	29	2	20		1568	" "	
4	0300	14,510	16.1	62	27	"	11	3/1.5	10.8	5.4	17.5	"	15	2.9	18/1.8	11,500	-	180		Ta	29	2	20		1568	" "	
5	0800	14,510	16.1	56	25	"	10	3/1.4	10.5	4.8	17.2	"	1	2.5	11/1.8	14,000	-	180		Ta	28	2	20		1568	" "	
6	0300	14,510	16.1	56	25	"	10	3/1.4	10.5	4.8	17.2	"	1	2.5	11/1.8	14,000	-	180		Ta	28	2	20		1568	" "	
7	1300	14,510	16.1	57	27	"	10	3/1.4	10.8	5.2	17.5	"	1	2.9	18/1.8	14,500	-	180		Ta	29	2	20		1568	" "	
8	1700	14,510	16.1	60	26	"	11	4/1.6	10.8	5	17.8	"	1	2.8	14/1.8	11,000	-	180		Ta	28	2	20		1568	" "	
9	0300	14,510	16.1	60	27	"	12	4/1.8	10.8	5.2	17.8	"	1	2.8	16/1.8	10,500	-	180		Ta	28	2	20		1468	" "	
10	0900	11,803	16.1	62	28	"	10	3.5/1.8	10.8	5.4	17.8	"	1	2.8	16/1.8	10,500	-	180		Ta	28	3	20		1468	Testing	
11	1230	11,803	14.4	76	30	"	20	6/2.5	11	4	17.2	"	1	3	19/1.9	10,000	-	100		Ta	25	2	24		1350	" "	

O.C.I. CONSULTANT REPRESENTATIVES Jim Saxon / Jim Bray

OILF. LD CONSULTANTS INTERNATIONAL

DRILLING MUD RECAP

(MUD PROPERTIES)

OPERATOR: Phillips Petroleum Company Norway CONTRACTOR: Dolphin Services RIG NO.: HARKEN 123005 WELL NAME: 2-7/15X  
 LOCATION: POST ELD FISK LEGAL DESCRIPTION: \_\_\_\_\_

DATE (1980)	TIME	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY (Sec/Qt)		PLASTIC VISCOSITY		YIELD POINT (lb/100 ft <sup>2</sup> )	GELS (lb/100 ft <sup>3</sup> ) 0/10	pH	FILTRATE (ml/30 min)			Coke (32nd in)	Alkalinity		Chloride (ppm)	Total Hardness (ppm)	Calcium (ppm)	Magnesium (ppm)	Sand (% by Vol.)	Solids (% by Vol.)	ON (% by Vol.)	MBT (me/ml mud)	BS/DS Ratio	Circ. Volume (bbls)	REMARKS
				API <sup>6</sup>	°F	cp	°F				API	HPHT	°F		P <sub>m</sub>	P/M <sub>1</sub>											
12	0300	11803	14.4	75	30	150	20	6/35	11	4	172	250	1	3	1.9	10,000	-	100	-	TR	25	2	24	-	1350	TESTING	
13	0300	11803	14.4	75	30	150	20	6/35	11	4	172	250	1	3	1.9	10,000	-	100	-	TR	25	2	24	-	1360	"	
14	1000	11803	14.5	78	30	"	22	7/40	10.8	5.1	178	"	1	3	1.9	10,000	-	100	-	TR	26	2	24	-	1350	"	
15	2300	11803	14.4	68	30	"	18	6/35	10.5	6.2	18	"	2	2.8	1.9	10,000	-	100	-	TR	26	2	22	-	1350	"	
16	0300	11803	14.4	68	30	"	18	6/35	10.5	6.2	18	"	2	2.8	1.9	10,000	-	100	-	TR	26	2	22	-	1350	"	
17	0300	11803	14.4	68	30	"	18	6/35	10.5	6.2	18	"	2	2.8	1.9	10,000	-	100	-	TR	26	2	22	-	1350	"	
18	1500	11803	14.4	66	28	"	19	6.5/36	10.5	7	186	"	2	2.5	1.9	10,000	-	100	-	TR	26	2	24	-	1350	"	
19	2100	11803	14.4	66	28	"	18	7/40	10.5	6.5	184	"	2	2.5	1.9	10,000	-	100	-	TR	25	2	24	-	1350	"	
20	2030	10145	14.4	70	30	"	20	7/42	10.8	5.8	19	"	2	2	1.7	11,500	-	150	-	TR	25	1	24	-	1085	"	
21	0300	10145	14.4	70	30	"	20	7/42	10.5	5.8	19	"	2	2	1.7	11,500	-	150	-	TR	25	1	24	-	1085	"	
22	0300	10145	14.4	70	30	"	20	7/42	10.8	5.8	19	"	2	2	1.7	11,500	-	150	-	TR	25	1	24	-	1085	"	
23	0300	10145	14.4	65	29	"	19	7/38	10.5	5.5	-	"	1	2.3	1.7	11,000	-	150	-	TR	25	2	22	-	1085	"	
24	0300	10145	14.4	65	29	"	19	7/38	10.5	5.5	-	"	1	2.3	1.7	11,000	-	150	-	TR	25	2	22	-	1085	"	
25	0300	10145	14.4	65	29	"	19	7/38	10.5	5.5	-	"	1	2.3	1.7	11,000	-	150	-	TR	25	2	22	-	1085	"	
26	1800	10145	14.4	58	26	"	14	4/32	10	5.0	-	"	1	2	1.7	13,000	-	200	-	TR	26	1	20	-	1138	"	
27	2200	9793	14.4	60	25	"	11	4/22	10	6.2	-	"	2	2.3	1.7	13,500	-	200	-	TR	26	1	20	-	1078	"	
28	0300	4303	14.4	60	25	"	11	4/22	10	6.2	-	"	2	2.3	1.7	13,500	-	200	-	TR	26	1	20	-	1078	"	
29	0300	4303	14.4	60	25	"	11	4/22	10	6.2	-	"	2	2.3	1.7	13,500	-	200	-	TR	26	1	20	-	1078	"	

O.C.I. CONSULTANT REPRESENTATIVES Jim Saxon / Jim Bray