

OPERATING AREA Conoco Norway Inc.  
6507/7-3

## TOTAL MATERIAL CONSUMPTION

<u>Material</u>	<u>Packaging</u>	<u>Quantity</u>
Aquagel	MT	41
Baroid	MT	375
Bicarbonate of Soda	50 kg sx	49
Borewell	25 kg sx	5
Caustic	25 kg sx	68
Con Det	55 gal dr	32
Dextrid	25 kg sx	387
Gypsum	40 kg sx	972
Lime	40 kg sx	12
Pac-R/Staflo R	25 kg sx	103
Pac-L/Staflo XL	25 kg sx	157
Polyzan	25 kg sx	110
XCD Polymer	25 kg sx	29
Wallnut	25 kg sx	15
Surflo B21	50 kg sx	20

OPERATING AREA      Conoco Norway Inc.  
6507/7-3

MATERIALS USED PER CASING INTERVAL

36" Section

<u>Material</u>	<u>Packaging</u>	<u>Quantity</u>
Baroid	metric ton	12
Aquagel	metric ton	15
Caustic	25 kg sack	4

26" Section

<u>Material</u>	<u>Packaging</u>	<u>Quantity</u>
Baroid	metric ton	23
Aquagel	metric ton	26
Caustic	25 kg sack	18
Wallnut F	25 kg sack	15
Q Broxin	25 kg sack	2

OPERATING AREA      Conoco Norway Inc.  
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## MATERIALS USED PER CASING INTERVAL

17 1/2" Section

<u>Material</u>	<u>Packaging</u>	<u>Quantity</u>
Baroid	MT	278
Gyp	40 kg sx	825
Dextrid	25 kg sx	305
Polyzan	25 kg sx	95
Staflo R	25 kg sx	50
Sodium Bicarb	50 kg sx	15
Caustic	25 kg sx	43
Staflo XLO	25 kg sx	40
Con Det	55 gal dr	32
Lime	40 kg sx	6
Surflo B-21	50 kg sx	12
Pac-L	25 kg sx	117
Pac-R	25 kg sx	5

OPERATING AREA      Conoco Norway Inc.  
6507/7-3

MATERIALS USED PER CASING INTERVAL

12 1/4" Section

<u>Material</u>	<u>Packaging</u>	<u>Quantity</u>
Baroid	MT	62
Dextrid	25 kg sx	82
Pac-R	25 kg sx	48
Polyzan	25 kg sx	15
Gypsum	40 kg sx	147
Sodium Bicarb	50 kg sx	34
XCD Polymer	25 kg sx	29
Lime	40 kg sx	6
Caustic	25 kg sx	3
Surflo B-21	50 kg sx	8
Borewell	25 kg sx	3

Operator Conoco Norway Inc.

Well 6507/7-3

Date 1985	Baroid MT	Caustic 25 kg	Pac-R 25 kg	XCD Polymer 25 kg	Surflo B-21 50 kg	Surflo W300 55 gal	Alum Sterate	Borrex 25 kg							Volume made	Volume used	Total volume	Cost		Test Section Remarks	
																		Daily	Cumulative		
	80.-	7.50	74.50	195.-	185.71	543.02	71.08	9.-									2288		This section	previous total 107408.50	
29.08	7	3						30							71		2359	852.50	852.50		
30.08	57	10			7	1		81							89	152	2296	6663.97	7516.47		
31.08		4						2									2296	48.00	7564.47		
01.09																	2300	0	7564.47		
02.09																	2300	0	7564.47		
03.09		1			2	2												378.92	7943.39		
04.09		1			4												2249	2299.40	10242.79		
05.09																	2184	0	10242.79		
06.09																	2166	0	10242.79		
07.09						1											2143	543.02	10785.81		
08.09																	2139	0	10785.81		
09.09																	2220	515.00	11300.81		
10.09																	2138	0	11300.81		
11.09																	2142	0	11300.81		
12.09						1											2134	543.02	11843.83		
13.09					1												2111	185.71	12029.54		
14.09																	2104	0	12029.54		
15.09																	2092	0	12029.54		
																				cost per bbl \$75.18	
																				Total mud cost drilling and testing	\$119438.04

54

# NOBSK PETROLEUM SERVICE A/S

# Daily Material Usage

Operator Conoco Norway Inc.

Well 6507/7-3

Date 1985	Baroid MT	Dextrid 25 kg	Pac-R 25 kg	Polyzan 25 kg	Gyp 40 kg	Sod. Bicarb 50 kg	XCD Polymer	Lime 40 kg	Caustic 25 kg	Surflo B-21 50 kg	Borrewell 25 kg	Volume made	Volume used	Total volume	Cost		12 1/4" Hole Remarks		
															Daily	Cumulative			
	80.-	20.-	74.50	180.-	5.15	11.-	195.-	4.-	7.50	85,71	9.-			2237		This section	previous total 86187.27		
13.08	3	45	10	7	32							511		2748	3309.80	3309.80			
14.08	17	18	8	5	24	3						220	83	2831	3372.60	6682.40			
15.08	6		16	3	9	28						21	238	2668	2566.35	9248.75			
16.08	3		4		20	3	6					5	19	2654	1844.00	11092.75			
17.08	4	13	3		32		5					190	47	2797	1943.30	13036.05			
18.08	3				9		7					6	2	2801	1651.35	14687.05			
19.08	3				11		4					5	19	2787	1076.65	15763.70			
20.08	2						2	2							558.00	16321.70			
21.08	3	6	2		10			1				106	61	2826	564.50	16886.20			
22.08	5							3				7	112	2721	412.00	17298.20			
23.08	2		5									3	66	2658	727.50	18025.70			
24.08	2						4		2	8		6	88	2576	2440.68	20466.38			
25.08													11	2565	0	20466.38			
26.08														65	2500	27.00	20493.73		
27.08	3													50	2450	240.00	20733.73		
28.08	6								1					168	2282	487.50	21221.23		
Totals	62	82	48	15	147	34	29	6	3	8	3	1080				21221.23			
				Transferred from 17 1/2" hole										2237					
																	21221.23	6.40/bbl	
																	86187.27		
				Total mud cost to drill well														107408.50	
												transferred to test section		2288 bbl					

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NORSK PETROLEUM SERVICE A/S

Daily Material Usage

Operator Conoco Norway Inc.

Well 6507/7-3

Date 1985	Baroid MT	Sod. Bicarb 50 kg	Gyp 40 kg	Dextrid 25 kg	Caustic 25 kg	Polyzan 25 kg	Staflor 25 kg	Staflor XLO 25 kg	Con Det 55 gal	Pac-L 25 kg	Lime 40 kg	Surflo B-21 50 kg	Pac-R 25 kg	Volume made	Volume used	Total Volume	Cost		Remarks		
																	Daily	Cumulative			
	80.-	11.-	5.15	20.-	7.50	180.-	74.50	74.50	185.-	74.50	4.-	181.71	74.50						17 1/2" Hole		
																			Previous total 12045.50		
05.08		5	187	95	29	14	50	30						1818	0	1818	11615.55	11615.55			
06.08			No material used													203	0	2021	0	11615.55	
07.08	87	10	153	38	2	47		10	6	8				1204	370	2855	19542.95	31158.50			
08.08	61		138	38	8	22			10	12				798	442	3211	13114.70	44273.20			
09.08	90		164	89	3	3			14	75	6	10		773	665	3319	20445.70	64718.90			
10.08	23		108	18	1	5			2	15				250	74	3495	5151.20	69870.10			
11.08	17		75	27		4				7			5	175	206	3464	3900.25	73770.35			
12.08												2		0	316	3148	371.42	74141.77			
Totals	278	15	825	305	43	95	50	40	32	117	6	12	5	5221	2073			74141.77	Cost per bbl: \$14.20		
Volume mud and premix transferred to 12 1/4" section																		2237 bbl			
																				12045.50	
																				74141.77	
																		Total cost to date		86187.27	

# NORSK PETROLEUM SERVICE A/S

# Daily Material Usage

Operator Conoco Norway Inc.

Well 6507/7-3

Date 1985	Baroid MT	Aquagel MT	Caustic 25 kg	Lime 25 kg	Walnut F 25 kg	QBroxin 25 kg					Volume made	Volume used	Total volume	Cost		Remarks	
														Daily	Cumulative		
	80.-	215.-	7.50	4.00	13.-								561			26" Hole	
31.07		7									176	0	737	1505.00	1505.00	This section previous total 4215.-	
01.08	2	14	9		15						1818	382	2173	3432.50	4937.50		
02.08			1			2					0	67	2106	25.50	4963.00		
03.08	16	4	3								459	1363	1202	2162.50	7125.50		
04.08	5	1	5								0	1202	0	652.50	7778.00		
Totals	23	26	18		15	2					2453				7778.00		
			Volume transferred from 36" Section								561						
											Total	3014			7778.00	2.58/bbl	
											7 sx Caustic used in preflush for cement job				52.50		
															4215.00		
															7778.00		
											Total cost to date				12045.50		



3.5.4 Mud Property Recap

WELL NAME: 6507/7-3



MUD PROPERTY RECAP

DATE	DEPTH	DENSITY	VISCOSITY	FILTRATE	HT/HP fill		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC	OTHER						
		PPG/			Cake	°500psi		PV	YP	10"	10'	Cl	Ca	Pf	Mf	Pm	Oil	Water	Corr. Solids	PPB							
		metres	secs	ccs	1"/32mm	ccs		1"/32mm	cp	lbs/100ft <sup>2</sup> -gms/cm <sup>2</sup>	mg/litre	ppm					%	%	%	Bent. Eq.	Excess Gyp	Sand %	ASG				
1985																											
28.07			100+																								
29.07	405	8.9	100+																								
30.07	469	8.6	100+																								
31.07	469	8.6	100+																								
01.08	1030	9.6	56				9.0	7	49			Seawater/Bentonite															
02.08	1030	9.7	55				8.8	8	49			Seawater/Bentonite															
03.08	775	8.6	100+																						open 26" hole		
04.08	1030	8.6	100+																						open 26" hole		
05.08	1023	8.5	100+									Gyp/Polymer premix for use in 17 1/2" Section															
06.08	1127	9.1	48	6.4	2		11.9	24	22	2	4	3000		.2	.4		0	96	4			6.2			3.35		
07.08	1318	9.8	51	4.8	1		9.5	16	20	1	2	4500	2000	.1	.2		0	94	6			4.2	1 1/2		4.01		
07.08	1469	10.1	55	4.8	1		9.2	18	22	4	6	5000	2000	.1	.2		0	91	9			5.8			3.39		
07.08	1630	10.8	59	4.5	1		9.0	23	22	6	10	5000	2000	.1	.3		0	87	13			6.5	2		3.29		
08.08	1740	11.1	59	5.6	2		9.1	23	23	6	20	4800		.05	.3		0	86	14			8.3	2 1/4		3.39		
08.08	1800	11.3	56	5.8	2		9.1	22	22	6	23	4700		.05	.3		0	86	14	12		7.7	1 1/2		3.57		
08.08	1900	11.5	74	8.2	2		9.0	22	31	18	34	4900		.05	.3		0	83	17	15		7.1	1 1/2		3.25		
09.08	2044	11.5	59	7.0	2		9.4	22	21	8	28	4000		.05	.2		0	83	17	18		7.6	1		3.25		
09.08	2140	11.5	65	5.0	2		9.0	23	22	9	31	4200		.05	.2		0	83	17			6.2	1		3.25		
09.08	2230	11.5	68	5.5	2		9.9	27	29	16	36	4200		.1	.3		0	83	17	17 1/2		6.4	1		3.25		

59

WELL NAME: 6507/7-3



MUD PROPERTY RECAP

DATE	DEPTH	DENSITY PPG/ secs	VISC. OSITY secs	FILTRATE		HY/HP filt		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC PPB	OTHER																		
				Cake 1"/32	° 500psi ccs	1"/32	PV cp		YP lbs/100ft <sup>2</sup>	10" gms/cm <sup>2</sup>	10' cm <sup>2</sup>	Cl mg/litre	Ca ppm	Pl	Mf	Pm	Oil %	Water %	Corr. Solids %	Bent. Eq.		Excess Gyp	Sand %	ASG																
																									ccs	ccs														
1985	metres																																							
10.08	2307	11.5	60	4.2	2			9.1	23	21	5	23	4200	1840	.1	.2					0	84	16	17			7.6	1%	3.4											
11.08	2307	11.6	62	4.6	2			9.0	26	22	8	34	4200	2160	.1	.2					0	85	15	18			8.4	3/4%	3.6											
12.08	2307	11.5	67	4.5	2			9.1	25	20	8	35	4200	2120	.05	.2					0	85	15	21			8.1	3/4%	3.6											
13.08	2307	10.5	56	6.2	2			10.8	15	14	4	12	3600		.2	.5					0	89	11	12			6.8	1/2%	3.4											
14.08	2307	10.5	48	4.0	1			11.2	16	13	3	10	3400	1680	.3	.4					0	89	11	12			7.6	1/2	3.4											
15.08	2360	10.5	51	3.9	1			9.8	17	14	4	10	2800	1480	.1	.3					0	89	11	12			6.8	1/2	3.4											
16.08	2381	10.5	57	4.1	1			9.8	17	15	4	10	3000	1680	.1	.3					0	89	11	13			6.9	1/4	3.4											
17.08	pit	10.5	65	4.0	1			9.7	20	19	5	12	2900		.1	.2					0	89	11	12			5.8	1/4	3.4											
17.08	2408	10.5	59	4.3	1			9.6	17	17	5	11	3000		.1	.2					0	89	11				7.0	1/4	3.4											
17.08	2417	10.5	56	4.2	1			9.7	16	16	4	10	3000	1720	.1	.3					0	89	11	11			7.9	1/4	3.4											
18.08	pit	10.5	61	4.2	1			9.7	20	20	5	11	3000		.1	.2					0	89	11	12			6.1	1/4	3.4											
18.08	2461	10.5	58	4.2	1			9.6	19	18	5	13	2900		.1	.2					0	89	11	12			6.6	1/4	3.4											
18.08	2470	10.4	57	4.3	1			9.5	19	20	5	14	2900		.1	.3					0	89	11	12			7.0	1/4	3.4											
19.08	2493	10.5	58	4.2	1			9.5	19	24	6	17	2900		.1	.2					0	89	11	12			7.7	1/4	3.4											
19.08	2500	10.5	57	4.1	1			9.3	18	25	6	17	3000		.1	.2					0	89	11				7.6	1/4	3.4											
19.08	2504	10.5	58	4.3	1			9.3	18	24	5	18	2900		.1	.2					0	89	11	11			7.5	1/4	3.4											
20.08	2566	10.5	60	4.3	1			9.1	18	23	6	17	3000		.1	.2					0	89	11	11			7.3	1/4	3.4											
21.08	2588	10.5	58	4.1	1			9.6	19	23	5	16	2900		.1	.2					0	89	11	11			7.5	1/4	3.4											
22.08	2615	10.5	59	4.0	1			10.1	18	23	6	23	2800	1480	.1	.2					0	89	11	11			7.4	1/4	3.4											

WELL NAME: 6507/7-3

MUD PROPERTY RECAP



DATE	DEPTH	DENSITY	VISC- OSITY	FILTRATE		HT/HP fill		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC	OTHER				
		PPG/		secs	ccs	Cake	°500psi		PV	YP	10"	10'	Cl	Ca	Pf	MI	Pm	Oil	Water	Corr. Solids	PPB	Sand %	ASG			
		metres			1"/32"	ccs	1"/32"	cp	lbs/100ft <sup>2</sup>	gms/100 cm <sup>2</sup>	mg/litre	ppm				%	%	%	Bent. Eq.	Excess GYP						
1985																										
22.08	2642	10.6	56	4.4	1			9.4	21	26	9	21	2800	1480	.03	.08		0	89	11			8.7	1/4	3.5	
23.08	pit	10.5	62	4.2	1			10.1	18	24	7	25	2800		.1	.2		0	89	11			7.5	1/4	3.4	
23.08	2777	10.6	61	4.4	1			9.5	19	24	8	26	2700		.1	.2		0	89	11			7.9	1/4	3.46	
24.08	2850	10.5+	55	4.4	1			10.0	19	23	7	21	2800	1400	.1	.2		0	89	11			7.0	tr	3.43	
25.08	pit 2850	10.6	50	4.7	1			10.0	16	22	7	22	2800		.1	.2		0	89	11			7.0	tr	3.46	
26.08	pit	10.6	50	4.7	1			9.5	16	20	7	21	2800		.1	.2		0	89	11			7.0	tr		
27.08	2850	10.6+	56	4.7	1			9.3	18	22	7	21	2800		.1	.2		0	89	11			7.4	1/4	3.55	
28.08	pit	10.6+	55	4.7	1			9.2	18	20	7	20	2700		.1	.2		0	89	11			7.0	tr	3.55	
29.08	2832	10.5	49	4.4	1			9.8	17	15	4	9	3100		.15	.4		0	90	10			7.3	tr	3.62	
30.08	circ. riser	10.5	45	4.6	1			10.0	15	13	4	8	3200		.15	.4							7.3			
31.08	pit	10.6	47	4.6	1			9.8	15	14	4	9	3200		.15	.4		0	90	10			7.3	tr		
01.09	pit	10.6	47	4.6	1			9.6	15	14	4	9	3200		.15	.2		0	90	10			7.0	tr		
02.09	pit	10.6	47	4.6	1			9.6	15	14	4	9	3200		.1	.2		0	90	10			7.0	tr		
03.09	circ. shakers pit	10.6	43	4.6	1			9.8	15	12	4	6	3200		.1	.3		0	90	10			7.0	tr		
04.09	pit	10.6	47	4.6	1			10.0	15	12	4	6	3200		.1	.3		0	90	10			7.0	tr		
05.09	pit	10.5	44	4.6	1			10.2	15	11	4	6	3200		.15	.4		0	90	10			7.0	tr		
06.09	pit	10.6	44	4.8	1			10.2	14	11	4	6	3200		.15	.4		0	90	10			7.0	tr		
07.09	pit	10.6	44	4.8	1			10.2	14	11	4	6	3200		.15	.4		0	90	10			7.0	tr		
08.09	pit	10.6	44	4.8	1			10.2	14	11	4	6	3200		.15	.4		0	90	10			7.0	tr		

WELL NAME: 6507/7-3



MUD PROPERTY RECAP

DATE	DEPTH	DENSITY	VISCOSITY	FILTRATE			pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC	OTHER															
				PPG/	secs	ccs		Cake	° 500psi	PV	YP	10"	10'	Cl	Ca	Pf	Mf	Pm	Oil		Water	Corr. Solids	PPB	Bent. Eq.	Excess Gyp	Sand %	ASG									
																												1"/32"	1"/32"	cp	lbs/100ft <sup>2</sup> -gms/100cm <sup>2</sup>	mg/litre	ppm	%	%	%
1985	metres																																			
09.09	pit	10.5	42	5.0	1		10.0	13	10	4	5	3500		.1	.3		0	90	10		6.5	tr														
10.09	pit	10.5	42	5.0	1		10.0	13	10	4	5	3500		.1	.3		0	90	10		6.5	tr														
11.09	pit	10.6	43	5.0	1		10.0	13	10	4	5	3500		.1	.3		0	90	10		6.5	tr														
12.09	pit	10.6	42	5.0	1		10.0	13	10	4	5	3500		.1	.3		0	90	10		6.5	tr														
13.09	pit	10.6	43	5.0	1		10.0	13	10	4	5	3500		.1	.3		0	90	10		6.5	tr														
14.09	pit	10.6	43	5.0	1		10.0	13	10	4	5	3500		.1	.3		0	90	10		6.5	tr														
15.09	pit	10.6	43	5.0	1		10.0	13	10	4	5	3500		.1	.3		0	90	10		6.5	tr														

Table 4.8

RFT pressures with pressure gradients calculated from mss (-25m RKB).

<u>DEPTH</u> <u>m (RKB)</u>	<u>FORMATION</u> <u>PRESSURE</u> <u>PSI</u>	<u>PRESSURE</u> <u>GRADIENT</u> <u>ppg</u>	*	<u>MEASURED</u> <u>DEPTH</u> <u>m (RKB)</u>	<u>FORMATION</u> <u>PRESSURE</u> <u>PSI</u>	<u>PRESSURE</u> <u>GRADIENT</u> <u>ppg</u>
2369	3629.1	9.09	*	2424.5	3687.9	9.03
2373	3633.4	9.09	*	2428	3691.5	9.02
2376	3636.4	9.08	*	2432	3696.9	9.02
2377.9	3638.5	9.08	*	2438	3718.5	9.05
2386	3647.1	9.07	*	2438.5	3712	9.03
2389.9	3651.4	9.07	*	2443	tight	-
2392.9	3655.0	9.07	*	2444.5	3733	9.06
2397	3658.9	9.06	*	2451.5	tight	-
2402	3666.4	9.06	*	2500.5	tight	-
2405.5	3667.6	9.05	*	2510	3785.2	8.95
2410	3672.9	9.04	*	2533	3818.2	8.94
2412	tight	-	*	2554.5	3849.4	8.94
2417	3680.1	9.04	*	2575	3879.5	8.93
2421	3684.2	9.03	*	2601	3917.2	8.93

Initial formation pressures from DSTs are as follows:

<u>DST No.</u>	<u>Mid-Perfs Depth</u>	<u>Pressure</u>	<u>Pressure Gradient (to mss)</u>
1	2421.5m	3680 psi	9.02ppg
2	2392.5m	3647 psi	9.05ppg
3	2374.0m	3631 psi	9.08ppg

5.4 RFT Analysis

Two RFT runs were made in 12 1/4" hole, the second of these was run predominantly to obtain a fluid sample.

The lowest observed oil in the well was at 2442m, however it is believed that this reflects the lithology (silty shale) and does not represent the true oil/water contact. From RFT pressure data excellent gradients have been constructed for oil and water, these intersect at 2491m (-2466 mss).

Table 5.4

RFT Pressure ResultsRun 1

Depth	Mud Hydrostatic (psia)	Formation (psia)	Permeability	Remarks
2369	4396.0	3269.1	v. good	
2373	4402.1	3633.4	v. good	
2376	4408.3	3636.4	v. good	
2377.9	4411.9	3638.5	v. good	
2386	4426.6	3647.1	v. good	
2389.9	4434.0	3651.4	v. good	
2392.9	4439.5	3655.0	good	
2397	4447.1	3658.9	v. good	
2402	4455.9	3666.4	v. good	
2405.5	4462.5	3667.6	good	
2410	4470.8	3672.9	good	
2410	2 3/4 gal would not open, one gal seal failure			
2412	4474.5	tight	-	
2417	4483.7	3680.1	v. good	
2417	2 3/4 gal would not open, filled 1 gal, at 3679.5 psia, v. good perm.			
2421	4491	3684.2	v. good	
2424.5	4497.4	3687.9	v. good	
2428	4503.5	3691.5	v. good	
2432	4510.9	3696.9	v. good	
2438	4522.2	3718.5	low	supercharged
2443	4531.1	tight	-	
2444.5	4534.0	3733.0	low	not stable, supercharged
2438.5	4522.7	3712.0	low	not stable, supercharged
2451.5	4546.7	tight	-	
2500.5	4636.8	tight	-	
2510	4654.0	3785.2	v. good	
2533	4696.2	3818.2	v. good	
2554.5	4736.1	3849.4	v. good	
2575	4774.4	3879.5	moderate	
2601	4823.2	3917.2	v. good	

Water leg gradient: 1.03 g/cc, (0.447 psi/ft)  
 Oil leg gradient: 0.75 g/cc, (0.325)  
 Intersection at 2491m (mdrkb), (-2466m)

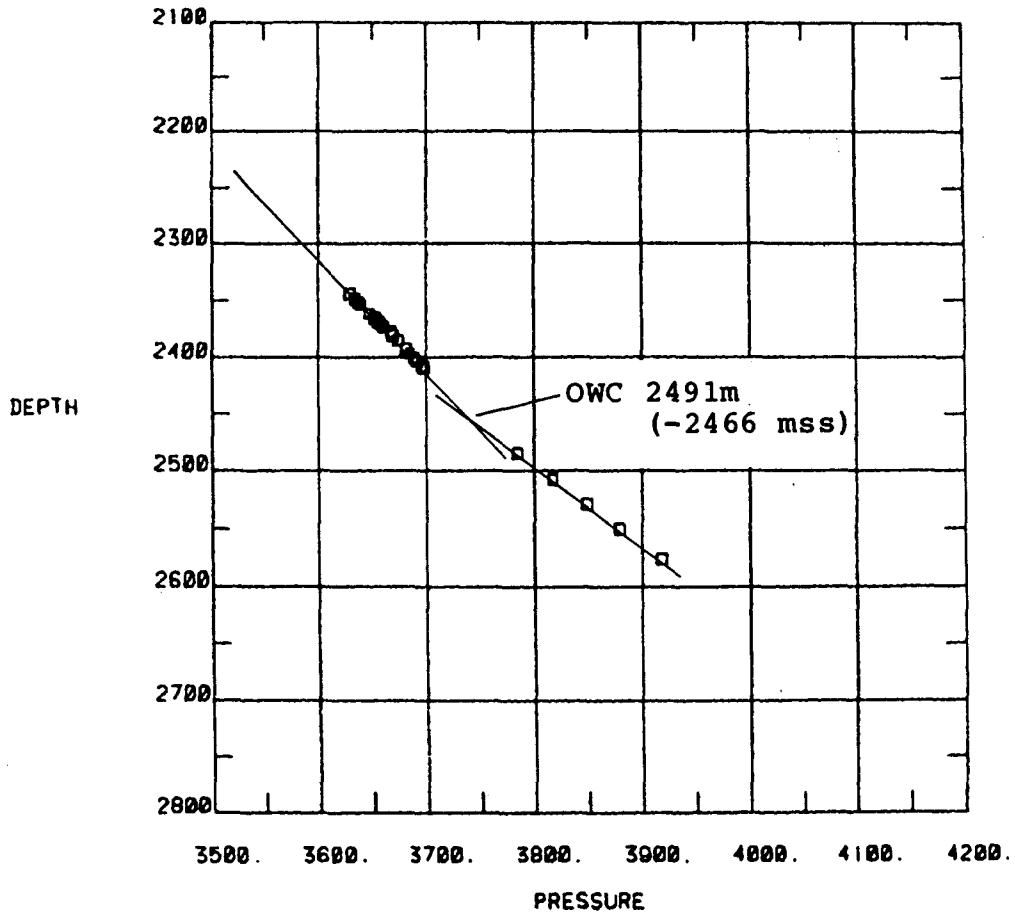
Run 2: (for sample)

Depth	Mud Hydrostatic (psia)	Formation (psia)	Permeability	Remarks
2390	4433	3651.8	v. good	2 3/4 gal would not open, 1 gal plugged.
2395	4441.5	3656.5	v. good	2 3/4 gal would not open, seal failure on 1 gallon.
2432	4509.3	3695.5	v. good	1 gal plugged
2433.5	4512.6	3697.1	v. good	1 gal plugged
2444.5	4832.5	tight	-	-
2393	4437.5	3653.8	v. good	1 gal plugged

Samples attempted at 2438 or 2451.5m, too tight.



## RFT ANALYSIS 6507/7-3



DEPTH RANGE: 0.0 TO 50.0  
26 POINTS PLOTTED OUT OF 51 FOR WELL: 0953  
25 NIL POINTS

## 5.5 DST Data

Between the 31st of August and the 12th of September 1985 three drillstem tests were performed in Middle Jurassic, oil bearing, sands.

The following intervals were perforated:

<u>DST No.</u>	<u>Interval</u>	<u>Zone</u>	<u>Formation</u>
1	2430 - 2413m	Oil	Tomma Formation
2	2400 - 2385m	Oil	Tomma Formation
3	2380 - 2368m	Oil	Tomma Formation

The general approach to the testing of zones 1, 2 and 3 was dictated by three major concerns:

- I) The possibilities of sand production.
- II) Obtaining representative fluid samples.
- III) Obtaining sufficient drawdown to produce a reasonable pressure build-up in the reservoir.

Full details may be found in the "Drillstem Test Report" to be found as Enclosure II of this report. Additional reports were prepared by OTIS, Sperry-Sun and Flopetrol, as listed in Section 4.4.

### Table 5.5 Summary of Test Results

DST No. 1 2413-2430m (RKB)

4853 BOPD  
 29 API  
 3.038 MMCF gas p/o  
 0.68 at 60°F  
 624ft<sup>3</sup>/BBL GOR  
 52/64 inch choke

DST No. 2 2385-2400m (RKB)

5465 BOPD  
 29 API  
 3.285 MMCF gas p/o  
 0.69 at 60°F  
 601ft<sup>3</sup>/BBL GOR  
 60/64 inch choke

DST No. 3 2368-2380m (RKB)

5173 BOPD  
 29 API  
 3.161 MMCF gas p/o  
 0.67 at 60°F  
 611ft<sup>3</sup>/BBL GOR  
 56/64 inch choke

## 5.6 Fluid Analysis

Fluid samples were collected from both RFTs and DSTs performed in the Middle Jurassic sands.

### 5.6.1 DST Samples

Analysis of crude oil samples recovered from drillstem tests was performed by Core Laboratories and EXPRO. A summary of results is included in table 5.6.1.

Table 5.6.1. Fluid Analysis

	DST 1	DST 2	DST 3
Relative Density at 60/60 <sup>o</sup> F	0.8780	0.8802	0.8870
API Gravity (conversion)	29.7	29.3	28.0
Sulphur Content, % wt	0.4715	0.4757	0.4779
Pour Point, <sup>o</sup> C	-55	-55	-44
Asphaltnines, % wt	0.36	0.23	0.67
Kinematic Viscosity			
i) Centistokes at 50 <sup>o</sup> C	6.68	6.31	6.25
ii) Centistokes at 25 <sup>o</sup> C	14.56	13.20	13.07
Salt Content, lbs/1000bbl	0.9	L 0.5	L 0.5
Ash Content, % wt	L 0.01	L 0.01	L 0.01
Wax Content, (precipitated at -30 <sup>o</sup> C) % wt	3.1	3.0	2.2

### 5.6.2 RFT Samples

The RFT sample chamber, containing fluids sampled at 2410m, was sent to GECO for analysis. The chamber contained 3.5 liters (92%) water and 0.3 liters (8%) oil of 26.4 API gravity.

Analysis of oil and water from RFT-tool

#### Oil phase:

Kinematic Viscosity at 40<sup>o</sup>C (ASTM 445-74) : 10cst  
 Density of dead oil at 15<sup>o</sup>C (Anton Paar) : 0.896 g/cc  
 Water content (Karl Fisher titration) : 0.093 w%

#### Water phase:

Sulphate content in water phase  
 (Spectrophotometric) Hach DR 2, : 3400 mg/l  
 Calcium content in water phase  
 (Atomic-Abs) : 630 mg/l

Because of the sulphate concentration, the water phase was considered to be mud-filtrate.

# DST # 1

## Summary of Test Results

Date of Test : 1 September, 1985  
 Formation Type : Middle Jurassic Sands  
 Perforated Interval : 2430 - 2413 m  
 Mid. Perfs. : 2421.5 m  
 Initial Flow Period : 13 mins.  
 Initial Build-Up : 77 mins.  
 Second Flow Period : 11 Hrs. 49 mins.  
 Second Build-Up : 24 Hrs.  
 Final Flow Period : 12 Hrs.  
 Final Build-Up : 24 Hrs.

Flow Period Results	Second Flow	Final Flow
Oil Flowrate	: 1053 BOPD	4853 BOPD
Gas Flowrate (total)	: 0.626 MMSCF/D	3.038 MMSCF/D
G.O.R. (total)	: 594 SCF/BBL	624 SCF/BBL
Choke Size	: 20/64"	52/64"
Av. Flowing BHP (at gauge depth)	: 3622 psia	3572 psia
FFBHP (at gauge depth)	: 3622 psia	3568 psia
Gauge Depth	: 2397.94 m	2397.94 m
Av. Flowing WHP	: 1051 psig	725 psig
FFWHP	: 991 psig	731 psig
Oil Gravity	: 29° API	29° API
Gas Gravity	: 0.67	0.68
H <sub>2</sub> S Content	: 0	0
CO <sub>2</sub> Content	: 2%	1.5%

## Buildup Analysis Results

Initial Formation Pressure : 3680 psia. (RFT 3684 psia) (mid-perfs.)  
 Mud Weight Equivalent : 8.9 ppg  
 Formation Pressure Gradient: 0.468 psi/ft. (1.536 psi/m) (ref. MSL)  
 Formation Temperature : 185° F  
 Temperature Gradient : 2.24° F/100 ft. (ref. mudline)

	Second Flow	Final Flow
Permeability - thickness	: 55,072 md-ft	52,946 md-ft.
Permeability	: 987 md	949 md
Skin Effect	: -0.4	-3.5
Radius of Investigation	: 998 ft.	977 ft.
Productivity Index (Actual)	: 34.5 BBL/D/psi	60.3 BBL/D/psi
Productivity Index (Theoretical)	: 32 BBL/D/psi	31 BBL/D/psi

# DST # 2

## Summary of Test Results

Date of Test : 5 September, 1985  
 Formation Type : Middle Jurassic Sands  
 Perforated Interval : 2400 - 2385 m  
 Mid. Perfs. : 2392.5 m  
 Initial Flow Period : 11 mins.  
 Initial Build-Up : 56 mins.  
 Second Flow Period : 9 Hrs. 26 mins.  
 Second Build-Up : 19 Hrs. 53 mins.  
 Final Flow Period : 11 Hrs. 55 mins.  
 Final Build-Up : 23 Hrs. 58 mins.

Flow Period Results	Second Flow	Final Flow
Oil Flowrate	: 743 BOPD	5465 BOPD
Gas Flowrate (total)	: 0.430 MMSCF/D	3.285 MMSCF/D
G.O.R. (total)	: 579 SCF/BBL	601 SCF/BBL
Choke Size	: 16/64"	60/64"
Av. Flowing BHP (at gauge depth)	: 3610 psia	3543 psia
FFBHP (at gauge depth)	: 3612 psia	3538 psia
Gauge Depth	: 2374.6 m	2374.6 m
Av. Flowing WHP	: 1125 psig	612 psig
FFWHP	: 943 psig	613 psig
Oil Gravity	: 29° API	29° API
Gas Gravity	: 0.67	0.69
H <sub>2</sub> S Content	: 0	0
CO <sub>2</sub> Content	: 1.5%	1%

## Buildup Analysis Results

Initial Formation Pressure : 3647 psia. (RFT 3655 psia) (mid-perfs.)  
 Mud Weight Equivalent : 8.94 ppg  
 Formation Pressure Gradient: 0.47 psi/ft.  
 Formation Temperature : 183° F  
 Temperature Gradient : 2.23° F/100 ft. (ref. mudline)

	Second Flow	Final Flow
Permeability - thickness	: 49,596.4 md-ft	49,319 md-ft.
Permeability	: 1008 md	1002 md
Skin Effect	: -3.1	-3.9
Radius of Investigation	: 882 ft.	989 ft.
Productivity Index (Actual)	: 43.7 BBL/D/psi	64.3 BBL/D/psi
Productivity Index (Theoretical)	: 29 BBL/D/psi	29 BBL/D/psi

# DST # 3

WELL 6507/7-3 : DST NO. 3

## Summary of Test Results

Date of Test : 11 September, 1985  
 Formation Type : Middle Jurassic Sands  
 Perforated Interval : 2368 - 2360 m  
 Mid. Perfs. : 2374 m  
 Initial Flow Period : 10 mins.  
 Initial Build-Up : 67 mins.  
 Final Flow Period : 17 Hrs. 33 mins.  
 Final Build-Up : 29 Hrs. 47 mins.

Flow Period Results	
Oil Flowrate (maximum)	: 5173 BOPD
Gas Flowrate (total)	: 3.161 MMSCF/D
G.O.R. (total)	: 611 SCF/BBL
Choke Size	: 56/64"
Av. Flowing BHP (at gauge depth)	: 3546 psia
FFBHP (at gauge depth)	: 3547 psia
Gauge Depth	: 2355.9 m
Av. Flowing WHP	: 652 psig
FFWHP	: 655 psig
Oil Gravity	: 29° API
Gas Gravity	: 0.67
H <sub>2</sub> S Content	: 0
CO <sub>2</sub> Content	: 1.2%

## Buildup Analysis Results

Initial Formation Pressure : 3631 psia. (mid-perfs.)  
 Mud Weight Equivalent : 9.0 ppg  
 Formation Pressure Gradient: 0.47 psi/ft. (ref. MSL)  
 Formation Temperature : 182° F  
 Temperature Gradient : 2.25° F/100 ft. (ref. mudline)

Slope	: 7.2 psi/cycle	1.52 psi/cycle
Permeability - thickness	: 61,300 md-ft	289,417 md-ft.
Permeability	: 1557 md	7351 md
Skin Effect	: -6	3.2
Radius of Investigation	: 1535 ft.	-
Productivity Index (Actual)	: 97 BBL/D/psi (maximum)	
Productivity Index (Theoretical)	: 35.7 BBL/D/psi	168 BBL/D/psi