

4. FORMATION TESTING

4.1 REPEAT FORMATION TESTS

An RFT was run during the 8 1/2" open hole logging suite to try and establish the formation pressure and producibility of various parts of the reservoir.

The tool was run in the hole a total of four times, once for pressure information, the other three times for sample collection.

Two amerada gauges were run with the RFT to confirm the pressure information given by the RFT gauge. A 33 psi temperature correction was applied to the RFT gauge readings for the six pressure points chosen, the results of which are given below in Table 5.

TABLE 5. RESULTS OF RFT PRESSURE RUN

Run 5A

✓

No.	Depth (mBRT)	Pressure (psig) RPG3 32328	Pressure (psig) RPG3 34527	Average RPG3 Pressure (psig)	Corrected RFT Pressure (psig)	ΔP (psi) RPG3-RFT
1 4	3551.5	7255	7277	7266	7205	61
2 5	3538.0	7406	7391	7398.5	7320	78.5
3 4	3505.0	7172	7159	7165.5	7080	25.5
4 2	3467.0	7133	7119	7126	7045	81
5 1	3458.0	7213	7203	7208	7124	84
6 3	3481.5	7152	7142	7147	7058	89

+14.5

It is thought that mud hydrostatic pressure leaked into the chamber for tests 2 and 5 at depths 3538.0 and 3458.0 m BRT respectively, these pressures were therefore considered suspect.

The points remaining in the oil zone confirm an oil gradient of approximately 0.29 psi/ft though there appears to be some conflict as to the absolute value of the pressures, the amerada pressures being consistantly higher than those measured by the RFT gauge (see Table 5).

An increase in pressure gradient is apparent on entering the transition zone though the magnitude of this increase is greater than would be expected using normal formation water gradients. This effect may be due to mud filtrate supercharging the low permeability intervals of the reservoir.

Three sampling runs were carried out at depths of 3467, 3458 and 3528 m BRT, a summary of their recoveries is given in Table 6.

TABLE 6. RECOVERIES FROM RFT SAMPLE RUNS

Run No.	Depth (mBRT)	Chamber (gals)	RECOVERY		
			Gas (ft <sup>3</sup> )	Oil (ccs)	Water (ccs)
5B	3467	1	11	--	3000 emulsion
		2 3/4	--	1500	8000
5C	3458	1	28	--	2900 emulsion
		2 3/4	--	--	9000 emulsion
5D	3528	1	Small Volume	--	3000
		2 3/4		--	4000

The pressures obtained from the RFT's together with those from the DST's are plotted versus depth in Fig. 21.

TABLE 10. A SUMMARY OF DST RESULTS

	DST 1B				DST 2				DST 3
Formation	Middle Jurassic				Upper Jurassic				Upper Jurassic
Perforations (m BRT)	3550 - 3552				3527 - 3530				3471.5 - 3463.5
Water cushion	3536 - 3540				6000 ft				3460 - 3453
	6000 ft								To surface
Fluid produced	Formation Water				Dry oil				Dry oil
Volume produced (BBLs)	27.5				26				3750
Oil gravity °API	-				39.4				39
Water SG. (at 20°C)	1.178				-				-
Rate (BPD)	60 - 90				37.5				~ 7000
Separator GOR (SCF/BBL)	-				-				370
Total GOR (SCF/BBL)	-				-				540
	Initial PBU		Final PBU		2nd PBU		Final PBU		Final PBU
Method of interpretation	Horner	Ramey	Horner	Ramey	Horner	Ramey	Horner	Ramey	Horner
kh (md ft)	1.79	3.17	1.86	3.33	10.07	12.68	20.02	14.65	31339
k (md)	0.09	0.16	0.09	0.17	1.0	1.27	2.0	1.46	640
s	-2.1	-5	-2.5	-5	+10	+10	+21	+10	+12.2
J <sub>ss</sub> (BPD/psi)	0.0044	-	0.0048	-	0.0067	-	0.0087	-	19
J <sub>ideal</sub> (BPD/psi)	0.0035	-	0.0036	-	0.0136	-	0.027	-	42.3
r <sub>inv</sub> (ft)	27	-	27	-	42	-	217	-	1896
P̄ (psig)	7030 at 3544 m BRT		7066 at 3544 m BRT		7164 at 3528.5 m BRT		7137 at 3528.5 m BRT		7088 at 3462.5 m BRT
Reservoir temperature (Q)	284 <sup>0</sup> F at 3610 m BRT				-				-

5. RESERVOIR FLUID PROPERTIES

5.1 Oil Properties

Twelve single phase oil samples were collected at the wellhead during DST 3. A rig site bubble point check was performed on each sample. Three of the samples were sent to Corelabs of Aberdeen for PVT analysis. The bubble points for the three samples were determined, and, as they were in good agreement with each other and within acceptable agreement of the on site results, the samples were combined for the remainder of the tests.

A summary of the main results is given below, the full report of the analysis can be found in the Corelab PVT report for 7/12-4.

Bubble point at	295°F	2417 psig
" " "	180°F	2087 "
" " "	60°F	1631 "

Compressibility at	180°F, 7000 psig	7.66 psi
" " "	295°F, " "	11.30 "

Viscosity of oil at	295°F, " "	0.480 cp
" " " " " "	2417 psig	0.368 "

GOR from single stage flash to	68°F, 0 psig	626 SCF/BBL
Bo " " " " " " " "		1.508 Res. B/BBL
Residual oil stock tank gravity from single stage flash	38.2° API	
GOR (total) from 3 stage flash to	60°F, 0 psig	553 SCF/STB
Bo " " " " " "		1.46 Res. B/STB
Residual oil stock tank gravity from 3 stage flash	39.4° API	
SG of gas from single stage flash (rel. to air)		1.011

	<u>Mole percent</u>
H <sub>2</sub> S	-
CO <sub>2</sub>	1.43
N <sub>2</sub>	1.64
Methane	30.31
Ethane	7.22
Propane	6.63
i Butane	1.33
n Butane	4.27
i Pentane	1.48
n Pentane	2.59
Hexanes	2.62
Heptanes	3.89
Octanes	5.15
Nonanes	3.91
Decanes plus	27.53
	<hr/>
	100.00
	<hr/>

The report appears internally consistent when checked against standard correlations. The results obtained must be considered to represent the most reliable results to date since previous analyses were based on recombination or RFT samples.

The only significant discrepancy in the report exists with the oil viscosity. The viscosities measured using the rolling ball viscometer were consistently higher than those predicted from the standard correlations and were considerably higher than obtained from previous 7/12 samples. At 7000 psig the viscometer measured an oil viscosity of 0.48 cp at 295<sup>o</sup>F whereas previous results indicated it was closer to 0.38 cp. From the correlations a viscosity in the region 0.4 - 0.43 cp was predicted, this must be considered more reasonable than the report value.

M U D   C O N T R O L

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( I M C O )

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MUD SUMMARY

The 36" hole was drilled to 174m and the 30" conductor run and cemented. A 26" hole was drilled to 498m and 20" casing was run and cemented. During these phases no mud problems were encountered.

Drilled out of 20" casing with a 17-1/2" bit. A Lime Drispac mud was formulated and used during this and all subsequent hole sections. During the drilling of the 17-1/2" hole 'gumbo' was abundant and proved troublesome. Heavy mud losses were incurred over riser and from the flow line when it was plugged by 'gumbo'. Problems with 'gumbo' also occurred during trips, and overpulls up to 100,000 lbs. were encountered. The logging operations were also delayed because of 'gumbo' problems, and trips had to be made to clean the hole. 13-3/8" casing was set at 1678m and cemented.

A 12-1/4" hole was drilled out below the 13-3/8" casing. Overpull on trips occurred down to about 2300m, but no major mud problems were encountered during the 12-1/4" hole interval. However, during the logging operations, a pit level increase was noted and gas/oil cut mud was circulated out as the mud weight was raised from 1.44 to 1.48 S.G. 9-5/8" casing was run and cemented with shoe at 3367m.

A 8-1/2" hole was drilled/cored to T.D. at 3621m without any major mud problems. A 7" liner was hung inside the 9-5/8" casing and cemented with the shoe at 3620m. During the first DST the A.P.R. test tool was plugged with dry barites, but apart from the plugging no other mud problems were encountered during the testing and cementing operations.

Daily record of drilling mud tests are shown on the following pages.



# IMCO SERVICES

A Division of HALLIBURTON Company  
 2400 West Loop South, P. O. Box 22605  
 Houston, Texas 77027 A/C 713 622-5555

## RECORD OF DRILLING MUD TESTS

COMPANY: **BP PET. DEV. OF NORWAY A/S**  
 WELL NAME & NO.: \_\_\_\_\_  
 7/12-4

API WELL NO.	STATE	COUNTY	WELL	S/T

FIELD: \_\_\_\_\_ COUNTY: \_\_\_\_\_ STATE: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_ Sec. T R

IMCO REPRESENTATIVE: \_\_\_\_\_

CASING	HOLE SIZE	NO. BITS	NO. DAYS
30" @ 169m	36	1	
20" @ 492m	36	1	
@			
@			
@			

TYPE MUD: LIME/DRISPAC

DATE 19 77	DEPTH ft. m	WEIGHT lbs/gal 5-G:1	VISCOSITY sec	PLASTIC VIS cps	YIELD VALUE lbs/100 ft <sup>2</sup>	GEL STRENGTH 10S 10M	pH	FILTRATE ml	HT-HP FILTRATE 500 psi 0.1 TEMP	CAKE 32nd IN.	ALKALINITY			SALT CHLORIDE ppm 8ppg	CALCIUM ION ppm	SAND % VOL	SOLIDS % VOL	OIL % VOL	WATER CONTENT % VOL	METHYLENE BLUE	
											Pf	Mf	Pm							EX	LIME
13.9	139	1.02	100±																		
14.9	174	1.02	100+																		
15.9	174	1.02	50																		
16.9	330	1.16	50																		
17.9	498	1.19	60																		
18.9	498	1.19	60																		
19.9	498	1.06	50																		
20.9	498	1.06	50																		
21.9	498	1.06	45																		
22.9	597	1.06	45	19	10	0	4	13	11	-											
23.9	799	1.40	48	20	25	8	10	12.5	15	-											
24.9	995	1.40	51	16	10	1	12	13	12	-	3	6.0	21	7000	TR	1.5	17	-	83	4.2	
25.9	1125	1.40	46	15	9	0	9	13	10	-	1	4	20	5000	TR	1.5	19	-	81	4.35	
26.9	1338	1.43	54	22	15	0	20	13	10.5	-	2	3.5	21	7500	400	TR	19	TR	81	4.72	
27.9	1407	1.44	47	20	11	0	19	13	8	-	2	4.5	27	9000	280	TR	18	TR	82	6.0	
28.9	1530	1.44	49	20	14	0	15	13	5.5	-	2	8.5	30	11000	160	TR	19	TR	81	6.0	
29.9	1587	1.44	47	16	8	0	19	13	5.5	-	2	6.5	30	11000	160	-	19	TR	81	6.4	
30.9	1587	1.4	45	17	8	0	10	13	5.9	-	2	6.0	29	11000	160		16	-	84	6.2	

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## RECORD OF DRILLING MUD TESTS

IMCO REPRESENTATIVE \_\_\_\_\_

TYPE MUD

LIME/DRISPAC

CASING	HOLE SIZE	NO. BITS	NO. DAYS
30" @ 169m	36	1	
20" @ 492m	26	1	
13-3/8 1678m	17-1/2		
@			
@			

COMPANY  
**BP PET. DEV. OF NORWAY A/S**

WELL NAME & NO.  
**7/12-4**

API WELL NO.	STATE	COUNTY	WELL	S/T

FIELD \_\_\_\_\_ COUNTY \_\_\_\_\_ STATE \_\_\_\_\_

CONTRACTOR \_\_\_\_\_

Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_

DATE 19 <u>77</u>	DEPTH ft. <u>m</u>	WEIGHT <input type="checkbox"/> lbs/gal <input type="checkbox"/> S.G.	VISCOSITY sec	PLASTIC VIS cps	YIELD VALUE lbs/100 ft <sup>2</sup>	GEL STRENGTH		pH	FILTRATE ml	HT-HP FILTRATE 500 psi 0°F	CAKE 32nd. IN.	ALKALINITY			<input type="checkbox"/> SALT CHLORIDE ppm <input type="checkbox"/> 8ppg	CALCIUM ION ppm	SAND % VOL	SOLIDS % VOL	OIL % VOL	WATER CONTENT % VOL	METHYLENE BLUE	
						10S	10M					Pf	Mf	Pm							me/gal	lb/100
1.10	1590	1.44	53	18	9	0	19	13	5.9	-	1	5.5		25	11000	280	-	19	TR	81	5.3	
2.10	1694	1.46	53	19	11	0	20	13.5	6.4	-	1	5.5		25	11000	240	-	19	TR	81	5.3	
3.10	1694	1.45	55	20	13	0	17	13.1	7.6	-	1	4.5		25	11000	200	-	18	TR	82	5.6	
4.10	1694	1.45	60	25	16	0	16	13	7.8	-	1	4.0		20	11000	240	-	19	TR	81	4.3	
5.10	1694	1.45	52	17	10	0	17	13	7.9	-	1	4.0		22	11000	240	-	17	TR	83	4.8	
6.10	1890	1.43	55	20	10	0	23	13	11	-	1	5.0		25	13000	120	-	18	TR	82	5.6	
7.10	2130	1.43	56	17	10	0	19	13	8.7	-	1	5.5		27	15000	240	-	18	1	81	5.8	
8.10	2300	1.44	57	17	9	0	20	13	9.3	-	2	3.5		17	16000	240	-	19	1	80	3.7	
9.10	2536	1.44	53	20	10	0	19	13	5.6	-	2	6		25	16000	240	-	19	1	80	5.25	
10.10	2649	1.44	52	25	15	0	26	13	5.8	-	1	3.5		17.5	16000	280	-	20	1	79	3.5	
11.10	2712	1.44	50	25	12	0	12	13	5.8	-	2	3.2		22.5	18000	240	±	20	TR	80	3.3	
12.10	2767	1.44	48	25	10	0	9	13	5.6	-	2	3.8		15.5	18000	280	±	20+	TR	80	3.83	
13.10	2829	1.44	46	22	10	0	7	13	5.6	-	2	3.3		16.0	18000	280	±	20	TR	80	3.43	
14.10	2887	1.44	46	21	10	0	6	13	5.6	-	1	4.2		21.0	16000	260	<-1	21	TR	79	4.6	
15.10	2897	1.44	48	25	11	0	8	13	5.6	-	1	4.0		18	15000	280	< 1/2	20	TR	80	3.84	
16.10	2920	1.44	48	20	12	0	7	13	5.7	-	1	3.2		16	18000	300	< 1/2	20	TR	80	3.5	
17.10	3056	1.44	48	26	11	0	6	13	5.8	-	1	6.0		20	18000	270	1	21	TR	79	3.95	

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COMPANY  
**BP PET. DEV. OF NORWAY A/S**

WELL NAME & NO.  
**7/12-4**

API WELL NO.	STATE	COUNTY	WELL	S/T

FIELD COUNTY STATE

CONTRACTOR Sec. T R

IMCO REPRESENTATIVE \_\_\_\_\_

CASING	HOLE SIZE	NO. BITS	NO. DAYS
30 @ 169m	36		
20 @ 492m	26		
13-3/8 @ 1678m	17-1/2		
9-5/8 @ 3367m	12-1/4		
@	8-1/2		

TYPE MUD LIME/DRISPA

DATE 19	DEPTH ft.	WEIGHT <input type="checkbox"/> lbs/gal <input type="checkbox"/> lbs/cu ft	VISCOSITY sec	PLASTIC VIS cps	YIELD VALUE lbs/100 ft <sup>2</sup>	GEL STRENGTH 10S 10M		pH	FILTRATE ml	HT-HP FILTRATE 50g TEMPERATURE	CAKE 32nd IN.	ALKALINITY			<input type="checkbox"/> SALT <input type="checkbox"/> CHLORIDE ppm <input type="checkbox"/> ppt	CALCIUM ION ppm	SAND % VOL	SOLIDS % VOL	OIL % VOL	WATER CONTENT % VOL	METHYLENE BLUE	
						PI	MI					Pm	meq/l	EX LIME								
18.10	2230	1.44	46	19	8	0	6	13	6.4	-	1	4	-	15	17000	240	1/2	20	TR	80	3.08	
19.10	3162	1.44	46	21	9	0	7	13	6.1	-	1	3	-	12.5	17000	120	1/2	20	TR	80	2.6	
20.10	3200	1.44	49	25	10	0	8	13	6.7	-	1	2.2	-	9	17000	160	1/3	20	TR	80	1.88	
21.10	3257	1.44	49	25	12	0	10	13	6.7	-	1	2.2	-	9	17000	280	1/2	20	TR	80	1.9	
22.10	3305	1.44	47	27	15	0	14	13	6.3	-	1	1.2	-	7	18000	80	1/4	20	TR	80	1.6	
23.10	3337	1.44	47	32	17	0	16	13	6.5	-	1	1.4	-	6.5	17000	160	1/3	20	TR	80	1.4	
24.10	3373	1.44	47	30	15	0	15	13	5.8	-	1	1.5	-	6.0	17000	120	1/4	20	TR	80	1.1	
25.10	3373	1.44	46	24	12	0	14	12.5	5.2	-	1	1.5	-	9.0	16000	160	1/2	19	TR	81	0.8	
26.10	3373	1.48	50	26	13	0	14	12.5	4.8	-	1	1.1	-	5.2	17000	200	1/2	19	TR	81	0.8	
27.10	3373	1.48	49	32	16	0	13	12.0	4.8	-	1	1.1	-	6.2	17000	200	1/2	19	TR	81	1.35	
28.10	3373	1.48	45	27	12	0	10	12.0	4.8	-	1	1.3	-	5.2	17000	100	1	19	TR	81	1.1	
29.10	3373	1.48	45	27	12	0	10	12.0	4.8	-	1	1.3	-	5.5	16000	160	1	19	TR	81	1.2	
30.10	3384	1.48	50	26	15	0	18	12.0	4.4	-	1	1.2	-	5.5	16000	120	1	18	TR	82	1.17	
31.10	3406	1.48	47	30	14	0	13	12.0	4.2	24	1	2.0	-	5.5	15000	120	1	18	TR	82	5.75	28.75
1.11	3448	1.48	52	30	10	0	9	12	3.9	20.5	1	1.3	1.0	5	16000	80	1	18	TR	82	5.7	28
2.11	3475	1.48	47	30	10	0	5	12	3.8	18.8	1	1.1	0.9	4.5	14000	120	3/4	18	TR	82	5.5	27
3.11	3492	1.48	46	24	8	0	4	12	3.9	18.7	1	0.9	-	3.0	12000	80	1/2	18	TR	82	5.5	27
4.11	3500	1.48	49	29	11	0	4	12.5	3.6	18.5	1	1.5	-	-	11000	80	1/2	18	TR	82	5	25

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IMCO REPRESENTATIVE \_\_\_\_\_

TYPE MUD

LIME/DRISPAC

CASING	HOLE SIZE	NO. BITS	NO. DAYS
30" @ 169m	36	_____	_____
20" @ 492m	26	_____	_____
13-3/8 @ 1678m	17-1/2	_____	_____
9-5/8 @ 3367m	12-1/4	_____	_____
@	8-1/2	_____	_____

COMPANY				
BP PET. DEV. OF NORWAY A/S				
WELL NAME & NO.				
7/12-4				
API WELL NO.	STATE	COUNTY	WELL	S/T
FIELD	COUNTY		STATE	
CONTRACTOR			Sec.	T R

DATE 19 77	DEPTH ft. m	WEIGHT lb/gal	VISCOSITY sec	PLASTIC VIS cps	YIELD VALUE lb/100 ft <sup>2</sup>	GEL STRENGTH 10S 10M	pH	FILTRATE ml	HT-HP FILTRATE 500 psi TEMP. °F	CAKE 32nd IN.	ALKALINITY			SALT CHLORIDE ppm gpg	CALCIUM ION ppm	SAND % VOL	SOLIDS % VOL	OIL % VOL	WATER CONTENT % VOL	METHYLENE BLUE	
											Pf	Mf	Pm							me/ml	lbs/bbl
5.11	3519	1.48	47	25	9	0 5	12.5	3.7	18.5	1	1.3	-	-	11000	120	1/2	18	TR	82	5	25
6.11	3537	1.48	45	25	8	0 4	12.5	3.6	18.7	1	1.1	-	-	11000	80	1/2	18	TR	82	5	25
7.11	3556	1.48	46	28	9	0 4	11.0	3.5	18.2	1	0.8	-	-	11000	80	1/2	19	TR	81	5	25
8.11	3621	1.48	50	35	15	0 7	12.0	3.5	18.0	1	1.1	-	-	11000	80	2/3	19	TR	81	5	25
9.11	3621	1.46	47	31	10	0 6	12.0	3.6	18.3	1	1.0	-	-	11000	80	1/2	19	TR	81	5	25
10.11	3621	1.48	50	30	11	0 6	11.0	3.7	18.5	1	1.0	-	-	11000	80	1/2	19	TR	81	5	25
11.11	3621	1.48	55	33	12	0 5	10.5	3.7	19.0	1	0.9	-	-	11000	120	1/2	19	TR	81	5	25
12.11	3621	1.47	53	30	9	0 5	10.0	3.6	19.0	1	0.6	-	-	11000	120	1/2	19	TR	81	5	25
13.11	3621	1.47	51	28	9	0 5	9.0	3.7	19.1	1	0.4	-	-	11000	120	1/2	19	TR	81	5	25
14.11	3621	1.48	52	30	15	0 13	9.0	4.1	20	1	0.3	-	-	13000	120	3/4	19	TR	81	4.5	22.5
15.11	3621	1.48	56	31	16	0 14	9.0	4.1	20.5	1	0.3	-	-	13200	100	1/2	18	TR	82	4.5	22.5
16.11	3621	1.48	53	29	16	0 13	9.0	4.0	20.5	1	0.28	-	-	13000	100	1/2	18	TR	82	4.5	22.5
17.11	3621	1.48	52	28	15	0 13	9.0	4.0	20.0	1	0.28	-	-	13000	100	1/2	18	TR	82	4.5	22.5
18.11	3621	1.48	51	27	15	0 11	9.0	4.0	20.0	1	0.28	-	-	13100	100	1/2	18	TR	82	4.0	20.0
19.11	3621	1.48	50	27	14	0 12	9.0	4.0	20.0	1	0.28	-	-	13000	100	1/4	18	TR	82	4.0	20.0
20.11	3621	1.48	48	27	13	0 11	9.0	4.0	20.0	1	0.28	-	-	13000	100	1/4	18	TR	82	4.0	20.0
21.11	3621	1.48	45	26	13	0 10	9.0	4.0	20.0	1	0.28	-	-	13100	100	1/4	18	TR	82	4.0	20.0
22.11	3621	1.49	53	32	14	0 15	12	3.8	19.8	1	1.2	-	-	13000	80	1/4	18	TR	82	5.0	25.0

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# IMCO SERVICES

A Division of HALLIBURTON Company  
2400 West Loop South, P. O. Box 22605  
Houston, Texas 77027 A/C 713 622-5555

## RECORD OF DRILLING MUD TESTS

IMCO REPRESENTATIVE \_\_\_\_\_

TYPE MUD LIME/DRISPAC

CASING	HOLE SIZE	NO. BITS	NO. DAYS
9-5/8 @ 3367	_____	_____	_____
7" @ 3620	_____	_____	_____
@	_____	_____	_____
@	_____	_____	_____
@	_____	_____	_____

COMPANY BP.PET.DEV. OF NORWAY A/S

WELL NAME & NO. 7/12-4

API WELL NO.	STATE	COUNTY	WELL	S/T
_____	_____	_____	_____	_____

FIELD \_\_\_\_\_ COUNTY \_\_\_\_\_ STATE \_\_\_\_\_

CONTRACTOR \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_

DATE 19 <u>77</u>	DEPTH ft. <u>III</u>	WEIGHT <input type="checkbox"/> lbs/gal <input checked="" type="checkbox"/> lbs/gal	VISCOSITY sec	PLASTIC VIS cps	YIELD VALUE lbs/100 ft <sup>2</sup>	GEL STRENGTH 10S 10M	pH	FILTRATE ml	HT-HP FILTRATE 500 PSI TEMP. <u>100</u>	CAKE 32nd IN.	ALKALINITY			<input type="checkbox"/> SALT CHLORIDE ppm <input type="checkbox"/> gpg	CALCIUM ION ppm	SAND % VOL	SOLIDS % VOL	OIL % VOL	WATER CONTENT % VOL	METHYLENE BLUE	
											Pt	Mf	Pm							me/ml	lbs/bbl
23.11	3621	1.48	54	41	18	0 16	12	3.3	18.8	1	1.5	-	-	13000	80	1/4	18	TR	82	5	25
24.11	3621	1.50	61	40	19	0 14	12	3.3	18.8	1	1.4	-	-	13000	80	1/4	18	TR	82	5	25
25.11	3621	1.48	50	26	9	0 7	11	3.4	19.2	1	1.0	-	-	13000	80	1/3	18	TR	82	5	25
26.11	3621	1.48	46	28	9	0 7	11	3.5	19.5	1	1.0	-	-	13000	80	1/2	18	TR	82	4.5	22.5
27.11	3621	1.48	51	28	8	0 7	11	3.6	19.6	1	0.9	-	-	13000	80	1/2	18	TR	82	4.5	22.5
28.11	3621	1.48	52	30	10	0 12	12	3.9	-	1	1.1	-	-	13000	80	2/3	19	TR	81	5	25
29.11	3621	1.48	46	29	15	0 12	12	3.9	20.1	1	1.1	-	-	13000	80	2/3	19	TR	81	5	25
30.11	3621	1.48	53	30	15	0 13	11	4.0	20.4	1	0.9	-	-	13000	80	2/3	19	TR	81	5	25
1.12	3621	1.48	50	29	12	0 13	11	4.2	-	1	0.8	-	-	13000	80	2/3	19	TR	81	5	25
2.12	3621	1.48	46	28	12	0 12	11	4.3	-	1	0.8	-	-	13000	80	2/3	19	TR	81	4.5	22.5
3.12	3621	1.49	46	26	10	0 12	11	4.3	-	1	0.8	-	-	13000	80	2/3	19	TR	81	4.5	22.5
4.12	3621	1.49	57	29	12	0 13	11	4.3	-	1	0.8	-	-	13000	80	2/3	19	TR	81	4.5	22.5
5.12	3621	1.49	45	24	9	0 10	11	4.3	-	1	0.8	-	-	13000	80	2/3	19	TR	81	4.5	22.5

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## MATERIAL CONSUMPTION BY CASING INTERVAL

30"

<u>Product</u>	<u>Units</u>
IMCO Gel	268 sacks
Caustic Soda	12 "
Soda Ash	8 "
Gypsum	1 "
Calcium Chloride	29 "

26" hole20" Casing

<u>Product</u>	<u>Units</u>
IMCO Gel	190 sacks
Caustic Soda	11.5 sacks
Soda Ash	11 "
Gypsum	16 "
Lime	4 "
IMCO Bar	5 "

17-1/2" Hole

13-3/8" Casing

<u>Product</u>	<u>Units</u>
IMCO Bar	538 m/t
IMCO Bar	1028 sacks
IMCO Gel	551 "
RD-555	622 "
Caustic Soda	168.5 sacks
Soda Ash	29 "
Lime	740 "
Drispac Reg.	28 "
Drispac SL.	139 "
Al Sterate	6 x 15 kgs
Desco	56 sacks
IMCO Thin	60 "

12-1/4" Hole

9-5/8" Casing

<u>Product</u>	<u>Units</u>
IMCO Bar	406 m/t
IMCO Bar	262 sacks
IMCO Gel	325 sacks
RD-555	707 sacks
Caustic Soda	160,5 sacks
Soda Ash	8 "
Lime	348 "
Drispac SL	259 "
IMCO Thin	297 "
Poly RX	15 "
Al Sterate	10 x 10 kgs
Al Sterate	5 x 15 kgs
Sodium Chromate	4 drums
Lubrikleen	1 drum

8-1/2" Hole7" Casing

<u>Product</u>	<u>Units</u>
IMCO Bar	129 m/t
IMCO Gel	90 sacks
RD-555	20 sacks
IMCO Thin	2 "
Caustic Soda	14 "
Soda Ash	11 "
Drispac SL	81 "
Poly RX	90 "

Testing Cost

<u>Product</u>	<u>Units</u>
IMCO Bar	87 m/t
IMCO Gel	126 sacks
Caustic Soda	15 "
Drispac SL	38 "
Poly RX	3 "



## MATERIAL CONSUMPTION TOTAL

<u>Product</u>	<u>Units</u>
IMCO Gel	1550 sacks
Caustic Soda	381.5 sacks
Soda Ash	67 sacks
Gypsum	17 "
Calicum Chloride	29 "
Lime	1092 "
IMCO Bar	1160 m/t
IMCO Bar	1295 Sacks
RD-555	1349 sacks
Drispac Reg	28 sacks
Drispac SL	517 "
Al Sterate	11 x 15 kgs
Al Sterate	10 x 10 kgs
Desco	56 sacks
Poly RX	108 sacks
IMCO Thin	359 "
Sodium Chromate	4 drums
Lubrikleen	1 drum