

Società Petrolifera Italiana S.p.A.  
ESGI



## Concessione ARCETO

**Cronologia e interpretazione delle prove sul pozzo Bertolani 1**

**Spi** S.p.A.  
Responsabile Esplorazione  
e Giacimenti  
*Dr. Sandro Mezzi*

Fornovo Taro, ottobre 2003

POZZO BERTOLANI 1

SOMMARIO DEL TEST DI LUNGA DURATA (agosto-settembre 2002)

Intervallo 897-902 m/RT

Data		Durata ore	Fase	Duse	Portata Sm <sup>3</sup> /g	Cumulativa Sm <sup>3</sup>	Tot.Liquidi litri	BHP kg/cm <sup>2</sup> r @ 870m/RT	THP kg/cm <sup>2</sup> r	ΔP fondo %	ΔP testa %	Note
dal	al											
27/08/2002	27/08/2002		Profilo statico iniz.	--	--	--	--	104,33	97,77	--	--	Battente liquido @ 850 m/RT
28/08/2002	28/08/2002	3	1 <sup>a</sup> Erogazione	1/8"	4800	860	0	70,25	95.70 -> 65.00	33	34	Pressione e portata in calo
28/08/2002	28/08/2002	17	2 <sup>a</sup> Erogazione	1/4"	10000	12380	510	31,83	65.00 -> 27.20	70	72	Pressione e portata in calo
28/08/2002	02/09/2002	98	3 <sup>a</sup> Erogazione	3/16"	3200	29000	650	20,04	27.20 -> 15.60	81	84	Pressione e portata in calo. (**)
02/09/2002	03/09/2002	26	4 <sup>a</sup> Erogazione	1/8"	1700	30500	650	31,83	15.60 -> 28.80	70	71	Pressione e portata in aumento
03/09/2002	24/09/2002	504	Buildup	--	--	30500	650	105,17	28.80 -> 102.14*	--	--	(*) THP Stimata da BHP
												Estratti memory gauges
												Fine PDP

**Note:**

Liquidi densità 1030 g/l, NaCl 24 g/l

(\*\*) 31/08/02 Registrato profilo dinamico. Emulsione a 500 m/RT.





**Spi**

**PRESSURE AND TEMPERATURE SURVEY REPORT**

FIELD NAME ARCETO

WELL NAME BERTOLANI # 1 Dir

DATE: 27/08/02

Cost center 258303

SINGLE COMPLETION  SELECTIVE   
 DUAL COMPLETION

SHORT STRING   
 LONG STRING

**General Data**

RKB Elevation @ m 7.45 Prima Flangia  Tbg Spool   
 Tubing Size OD 2" 7/8 Weight [lb/ft] 6.5 @ m. 872  
 Tubing Size OD \_\_\_\_\_ Weight [lb/ft] \_\_\_\_\_ @ m. \_\_\_\_\_  
 Tubing Shoe Ø 2" 7/8 @ m. 872  
 Minimum I.D. String L.N. "R" 2.25 mm @ mt 870

**POOL**

Perforated Zones  Open Hole   

From [m]	To [m]
<u>897</u>	<u>902.0</u>

**Wellhead Pressure Check**

Annulus TBG / 7" CHP 45 [Kg/cm<sup>2</sup>]  
 Annulus 7" 9" 5/8 CHP 12 [Kg/cm<sup>2</sup>]  
 Annulus \_\_\_\_\_ / \_\_\_\_\_ CHP \_\_\_\_\_ [Kg/cm<sup>2</sup>]

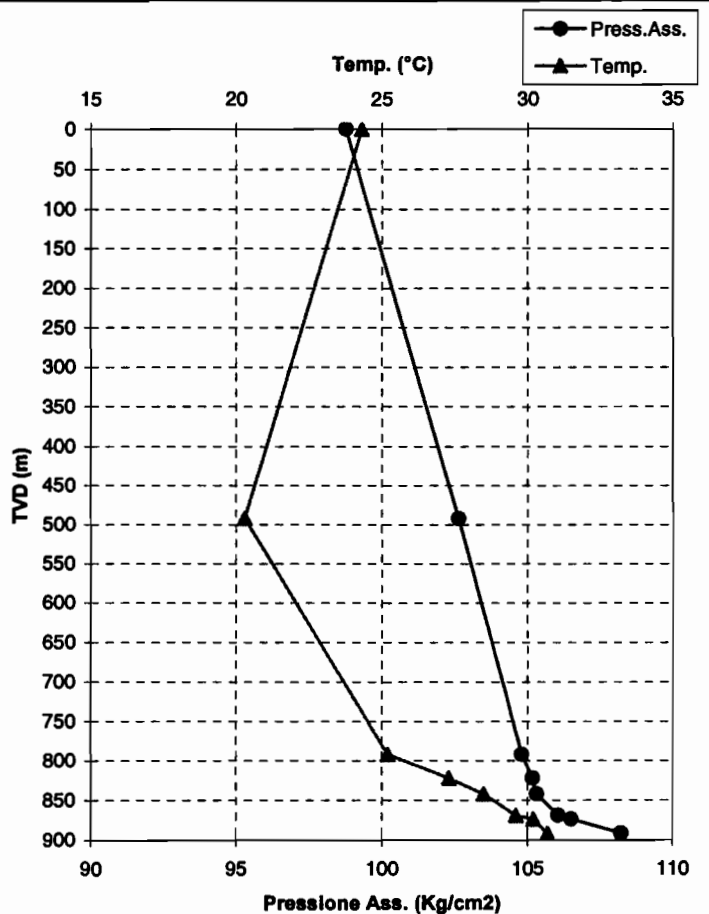
Tbg Drifted with CUCCHIAIA Size 38 mm To [m] 1060 Last Depth 1070 [m]  
 B.H. Sample FANGHIGLIA

**Survey Report**

**Well Status**

SHUT IN  Q. GAS \_\_\_\_\_ [Sm<sup>3</sup>/gg]  
 FLOWING  Q. OIL \_\_\_\_\_ [m<sup>3</sup>/gg]  
 CHOKE SIZE \_\_\_\_\_ Q. WATER \_\_\_\_\_ [m<sup>3</sup>/gg]

Time [HH:MM]	M.D. [m]	T.V.D. [m]	Temp. [°C]	Press.Ass. [Kg/cm <sup>2</sup> ]	Gradient [Kg/cm <sup>2</sup> /m]	T.H.P. [Kg/cm <sup>2</sup> ]
16.25	0.0	0.0	24.3	98.77		97.8
16.42	500.0	492.0	20.3	102.64	0.0079	97.8
16.54	800.0	792.0	25.2	104.81	0.0072	97.8
17.01	850.0	822.0	27.3	105.18	0.0123	97.8
17.07	870.0	842.0	28.5	105.33	0.0075	97.8
17.13	897.0	869.0	29.6	106.06	0.0270	97.8
17.19	902.0	874.0	30.2	106.52	0.0920	97.8
17.26	920.0	892.0	30.7	108.24	0.0956	97.8
17.50	0	0	22.0	98.55	0.0109	97.8



THP GAUGE - THP DEAD WEIGHT TESTER = 0.97 Kg/cm<sup>2</sup>

Liquid level @	Gradient [Kg/cm <sup>2</sup> /m]	From [m]	To [m]
850	Gas 0.0078	0	850
Density [g/l]	Oil		
	Water 0.0948	850	892

Element Type METROLOG Qz CGM-B V3.04  
 Serial N° 7505 Last calibration Luglio '02  
 Work. pressure [kg/cm<sup>2</sup>] 1000 Work. Temperature [°C] 150

**Situation After the Job**

NO TOOLS IN HOLE  SCSSV   
 TSV  BPV  PLUG  OTHER TOOLS

Actual Bottom Hole: 1060  
 Max Size Run in Hole Ø 57 mm @ m 870

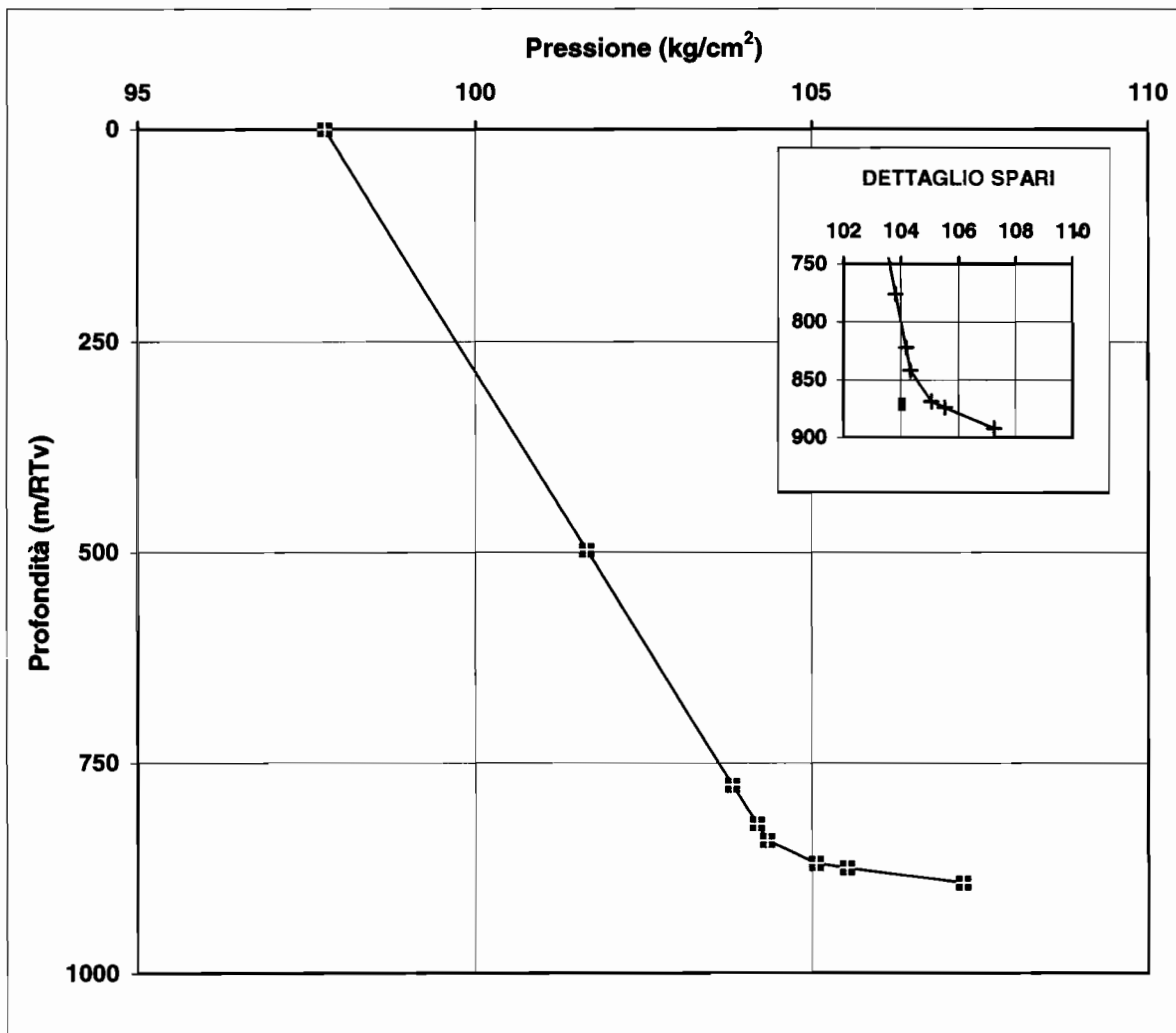
Note \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Supervisore PASQUETTO CARLO  
 Rappresentante W.S.M. R. Zoccarato



# BERTOLANI 1 DIR

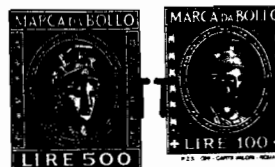
String Singola - Liv. 897-902 m/RT  
PROFILO STATICO DI PRESSIONE DEL 27/08/02



N°	PROF. m/RT	PROF. m/RT v	PRESSIONE kg/cm <sup>2</sup> r	GRAD. kg/cm <sup>2</sup> /m	TEMP. °C	NOTE
1	0.0	0.0	97.77		24.3	
2	500.0	497.0	101.64	0.008	20.3	
3	800.0	776.0	103.81	0.008	25.2	
4	850.0	822.0	104.18	0.008	27.3	
5	870.0	842.0	104.33	0.007	28.5	
6	897.0	869.0	105.06	0.027	29.6	
7	902.0	874.0	105.52	0.092	30.2	
8	920.0	892.0	107.24	0.096	30.7	
9	Pressione casing 45 kg/cm <sup>2</sup>					
10	Fondo pozzo @ 1060 m/RT					

DATI GENERALI	
Tavola Rotary:	79 m s.l.m.
TOP Spari:	897.0 m/RT
BOTTOM Spari:	902.0 m/RT
Datum:	897.0 m/RT
	789.6 m/RT v

RISULTATI	
Gradiente GAS:	0.0078 kg/cm <sup>2</sup> /m
Gradiente ACQUA:	0.092 kg/cm <sup>2</sup> /m
Battente:	850 m/RT
SBHP Datum:	105.36 kg/cm <sup>2</sup> a





# Spi

## WIRE LINE REPORT

WELL NAME BERTOLANI 1 D  
 FIELD NAME ARCETO  
 Cost center 258303

DATE: 27/08/2002 ARPO - 11

SINGLE COMPLETION  SELECTIVE  SHORT STRING  Well Code \_\_\_\_\_  
 DUAL COMPLETION  LONG STRING

General Data			
RKB Elevation @ m.	7.45	Base Flange <input checked="" type="checkbox"/>	Tbg Spool <input type="checkbox"/>
Tubing Size OD	2"7/8	Weight [lb/ft]	6.5 @ m. 872
Tubing Size OD		Weight [lb/ft]	@ m.
Tubing Shoe Ø	2 7/8 "		@ m. 872
Packer data	" FH 47 B4 " BAKER		@ m. 863
			@ m.
Minimum I.D. String	S.N. " R " ( BAKER ) = 2,25 " @ m 870		
Previous Bottom Hole	@ m.	#	1070

Flanges			
Top Flange Ø	2"1/16	Psi	3000
Flowing Flange Ø	2"1/16	Psi	3000
Kill Line Flange Ø	2"1/16	Psi	3000
BPV Type	TSB	Ø	2 1/2 "

Wellhead Pressure Check			
STHP	99.9	[Kg/cm <sup>2</sup> ]	CHP [Kg/cm <sup>2</sup> ]
Annulus	2"3/8 /	7"	P 45 [Kg/cm <sup>2</sup> ]
Annulus	7" /	9"5/8	P 12 [Kg/cm <sup>2</sup> ]
Annulus	9"5/8 /	13"5/8	P NN [Kg/cm <sup>2</sup> ]

**Request Operation**  
 RECUPERO MANDRINO OTIS " W " 2 1/2 " + PLUG BEAN OTIS " D " 2 1/2 " , CALIBRATURA E PROFILO STATICO PER SUCCESSIVO LIMIT TEST.

POOL	
Perforated Zones <input checked="" type="checkbox"/>	Open Hole <input type="checkbox"/>
From [m]	To [m]
897	902

Note \_\_\_\_\_

**Operation Description**

07,00 - 08,00 ATTESO OPERATORE AGIP PER APERTUA CANCELLO D'INGRESSO.

08,00 - 08,30 SAFETY MEETING.

08,30 - 19,30 RIG UP ATTREZZATURAWELL TESTING , ESEGUITO IMPIANTO DI MESSA A TERRA , COME DA LAY OUT.

IN CONTEMPORANEA , R/UP WIRE LINE :

- \* REGISTRATO PRESSIONI TESTA POZZO E INTERCAPEDINI ; DISCESO CON PULING TOOL " RB " 2 1/2 " + PRONG ED
- \* ESTRATTO MANDRINO OTIS " W " 2 1/2 " + PLUG BEAN " D " 2 1/2 " DA m 202.
- \* CALIBRATO STRING CON CUCCHIAIA 38 mm @ m 1060 , CAMPIONE : FANGHIGLIA MOLTO DENSA ; FONDO POZZO PRECEDENTE 1070 m REGISTRATO IL 22/02/91.
- \* DISCESO GAUGE CUTTER 57 mm @ m 870.
- \* ESEGUITO PROFILO STATICO DI P/T CON LE SEGUENTI FERMATE : 0 , 500 , 800 , 850 , 870 , 897 , 902 , 920.
- \* CHIUSO POZZO TRAMITE MASTER E SWAB VALVE.

### Situation After the Job

NO TOOLS IN HOLE  SCSSV   
 TSV  BPV  PLUG  OTHER TOOLS

Actual Bottom Hole: 1060  
 Max Size Run in Hole Ø 38 @ m 1060

Note \_\_\_\_\_

Supervisor  
PASQUETTO CARLO  
MONTANARI ROBERTO  
 Superintendent  
SAVI CLAUDIO





# Spi

## WIRE LINE REPORT

WELL NAME BERTOLANI 1 D  
 FIELD NAME ARCETO  
 Cost center 258303

DATE: 27/08/2002 ARPO - 11

SINGLE COMPLETION  SELECTIVE  SHORT STRING   
 DUAL COMPLETION  LONG STRING  Well Code \_\_\_\_\_

General Data			
RKB Elevation @ m.	7.45	Base Flange <input checked="" type="checkbox"/>	Tbg Spool <input type="checkbox"/>
Tubing Size OD	2 7/8	Weight [lb/ft]	6.5 @ m. 872
Tubing Shoe Ø	2 7/8 "	Weight [lb/ft]	@ m.
Packer data	" FH 47 B4 " BAKER		@ m. 863
Minimum I.D. String	S.N. " R " ( BAKER ) = 2,25 "		@ m 870
Previous Bottom Hole	@ m.	#	1070

Flanges			
Top Flange Ø	2 1/16	Psi	3000
Flowing Flange Ø	2 1/16	Psi	3000
Kill Line Flange Ø	2 1/16	Psi	3000
BPV Type	TSB	Ø	2 1/2 "

Wellhead Pressure Check			
STHP	99.9	[Kg/cm <sup>2</sup> ]	CHP [Kg/cm <sup>2</sup> ]
Annulus	2 3/8 / 7"		P 45 [Kg/cm <sup>2</sup> ]
Annulus	7" / 9 5/8		P 34 [Kg/cm <sup>2</sup> ]
Annulus	9 5/8 / 13 5/8		P NN [Kg/cm <sup>2</sup> ]

**Request Operation**  
 RECUPERO MANDRINO OTIS " W " 2 1/2 " + PLUG BEAN OTIS " D " 2 1/2 " , CALIBRATURA E PROFILO STATICO PER SUCCESSIVO LIMIT TEST.

POOL	
Perforated Zones <input checked="" type="checkbox"/>	Open Hole <input type="checkbox"/>
From [m]	To [m]
897	902

Note \_\_\_\_\_

**Operation Description**

07,00 - 07,30 SAFETY MEETING.

08,00 - 09,30 CON OPERAZIONE WIRE LINE DISCESO E FISSATO IN L.N. " R " @ m 870 , TANDEM MEMORY GAUGE METROLOG , MOD. QZ. CGM - B - V3.04 ( RANGE 0 - 1000 BAR ; 0 - 150 °C ) S.N. = 7505 , 7503 . ULTIMA TARATURA LUG. 2002.

QUOTE DI FISSAGGIO MEMORY : TOP @ 871,5 m , BOTTOM @ 872,5 m ; MISURE DEVIATE

09,30 - 12,00 ATTESA PER STABILIZZAZIONE STHP

**N.B. INIZIO RENTAL ORE 09:30 DEL 28/08/02 TANDEM MEMORY GAUGE CRISTAL QZ. LUNGA DURATA.**

OPERATIVI: **WSM : WIRE LINE - GEOSERVICES : WELL TESTING.**

STAND BY :

RILASCIATI :

**Situation After the Job**

NO TOOLS IN HOLE  SCSSV   
 TSV  BPV  PLUG  OTHER TOOLS

Actual Bottom Hole: 1060  
 Max Size Run in Hole Ø 38 @ m 1060

Note \_\_\_\_\_

Supervisor  
**PASQUETTO CARLO**  
**MONTANARI ROBERTO**  
 Superintendent  
**SAVI CLAUDIO**





# WELL TEST REPORT

(Record Data)

WELL NAME BERTOLANI 1D  
 FIELD NAME ARCETO  
 Cost center 258303

DATE: 28/08/2002 Test N°: 1 ARPO 10/C

SINGLE COMPLETION		DUAL COMPLETION				SELECTIVE		SHORT STRING		LONG STRING		Remarks											
Time	Prog. Time	C.H.P. Kg/cm <sup>2</sup>	Choke Size	Up	Down	T.H.P. Kg/cm <sup>2</sup>	T.H.T. °C	Depth	B.H.P. Kg/cm <sup>2</sup>	B.H.T. °C	Separator Press. PSIG		Temp. °F	LIQUIDI PARZ. LI	LIQUIDI PROG. LI	FLUIDO SMOGL	PORTATA GAS	S.G. GAS AIR=1					
APERTO POZZO PER LIMIT TEST CON DUSE 1/8" FIX. EROGAZIONE AL SEPARATORE.																							
12.00	0					95.70																	
12.01	1		1/8			91.40																	
12.02	2		1/8			89.30																	
12.03	3		1/8			86.50																	
12.05	5		1/8			83.70																	
12.07	7		1/8			79.40																	
12.10	10		1/8			75.60																	
12.12	12		1/8			72.40																	
12.15	15		1/8			70.30																	
12.20	20		1/8			68.50																	
12.25	25		1/8			72.10																	
12.30	30		1/8			77.30																	
12.45	45		1/8			82.00																	
13.00	60	46.5	1/8		20	81.50	20				55	70	NN			6400	0.562						
13.15	75		1/8			79.50																	
13.30	90		1/8			78.90																	
13.45	105		1/8			77.40																	
14.00	120	46.5	1/8		20	75.50	20				50	70	NN			5400	0.562						
14.30	150		1/8			70.30																	
15.00	180	46.5	1/8		20	71.50	20				55	70	NN			5300	0.562						
15.30	210		1/8			68.90																	
16.00	240		1/8		18	67.30	18				50	60	NN			5000	0.562						
16.30	270		1/8			66.00																	
17.00	300/0	45	1/8		18	65.00	18				50	60	NN			4800	0.562						
17.05	5		1/4			44.50																	
17.10	10		1/4			37.30																	
17.15	15		1/4			35.50																	
17.30	30		1/4			32.60																	
18.00	60		1/4		18	58.70	18				60	60	200	200	H2O	20600	0.562						
18.30	90		1/4			60.00																	
19.00	120	44	1/4			58.30																	
												NaCl = 24 gr/ft - D = 1030 gr/ft - PH = 7		NaCl = 24 gr/ft - D = 1030 gr/ft - PH = 7								TR DI LIQUIDO A GIORNO	



ESEGUITO CONTROL.  
DUSE : OK.

Superintendent  
**SAVI C.**

Supervisor  
PASQUETTO CARLO (G)- MONTANARI ROBERTO (N)

Well Code \_\_\_\_\_ Test N° 1  
 Start Date 28/08/2002 End Date \_\_\_\_\_

pag. 1  
of 9



# WELL TEST REPORT

(Record Data)

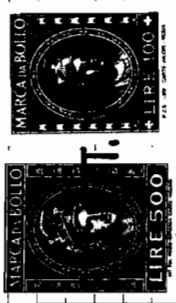
WELL NAME BERTOLANI 1D  
 FIELD NAME ARCETO  
 Cost center 258303

ARPO 10/C

Test N°: 1

DATE: 28/08/2002

SINGLE COMPLETION		DUAL COMPLETION		SELECTIVE		SHORT STRING		LONG STRING		Remarks									
Time	Progr. Time	C.H.P. Kg/cm <sup>2</sup>	Choke Size	Up in	Down in	T.H.P. Kg/cm <sup>2</sup>	T.H.T. °C	Depth m	B.H.P. Kg/cm <sup>2</sup>		B.H.T. °C	Separator Press. PSIG	Temp. °F	LIQUIDI PARZ. LI	RECUP. LIQUIDI	RECUP. LIQUIDI	FLUIDO GAS	PORTATA GAS	S.G. GAS
hr : min	min					REL.			ASS								Smc/g	AIR=1	
19.30	150	44		1/4		56.30	14				60	60	N/N	N/N		23,000	0.562		
20.00	180			1/4		55.10					208	60	N/N	N/N		21,900	0.562		
20.30	210			1/4		56.00					208	60	N/N	N/N		20,700	0.562		
21.00	240			1/4		55.20	13				208	60	N/N	N/N		18,500	0.562		
21.30	270			1/4		54.40					208	60	N/N	N/N		17,200	0.562		
22.00	300	44		1/4		53.00					208	60	N/N	N/N		16,000	0.562		
22.30	330			1/4		52.00	13				208	60	N/N	N/N		15,600	0.562		
23.00	360			1/4		49.50					208	60	N/N	N/N		14,700	0.562		
23.30	390			1/4		49.00					208	60	N/N	N/N		14,501	0.562		
0.00	420			1/4		47.40	13				208	60	N/N	N/N		13,400	0.562		
0.30	450			1/4		46.40					208	60	N/N	N/N		12,800	0.562		
1.00	480	44		1/4		43.80					208	60	N/N	N/N		12,200	0.562		
1.30	510			1/4		43.70	13				208	60	N/N	N/N		11,100	0.562		
2.00	540			1/4		42.60					208	60	N/N	N/N		10,400	0.562		
2.30	570			1/4		41.40					208	60	N/N	N/N		10,000	0.562		
3.00	600			1/4		39.80	13				208	60	N/N	N/N		9,500	0.562		
3.30	630			1/4		39.00					208	60	N/N	N/N		9,000	0.562		
4.00	660	44		1/4		36.70	12				208	60	N/N	N/N		8,500	0.562		
4.30	690			1/4		37.40					208	60	N/N	N/N		8,000	0.562		
5.00	720			1/4		36.00					208	60	N/N	N/N		7,500	0.562		
5.30	750			1/4		33.70	12				208	60	N/N	N/N		7,000	0.562		
6.00	780			1/4		34.20					208	60	N/N	N/N		6,500	0.562		
6.30	810			1/4		32.40					208	60	N/N	N/N		6,000	0.562		
7.00	840	44		1/4		32.40	12				208	60	N/N	N/N		5,500	0.562		
7.30	870			1/4		31.40					208	60	N/N	N/N		5,000	0.562		
8.00	900			1/4		30.40					208	60	N/N	N/N		4,500	0.562		
8.30	930			1/4		29.80	15				120	70	N/N	N/N		4,000	0.562		
9.00	960			1/4		28.80					115	70	N/N	N/N		3,500	0.562		
9.30	990			1/4		28.50					115	70	N/N	N/N		3,000	0.562		
10.00	1020/0	45		1/4		27.20	15				115	70	N/N	N/N		2,500	0.562		



29/08/2002

NaCl = 24gr/lt - D = 1030 gr/lt - PH 7

DECREMENTATO  
DUSE A 3/16 "

Well Code \_\_\_\_\_ Start Date 28/08/2002 End Date 28/07/2002 Test N° 1 of 1

Supervisor PASQUETTO CARLO (G) - MONTANARI ROBERTO (N) Superintendent SAVI C.





Spiti

# WELL TEST REPORT (Record Data)

WELL NAME: BERTOLANI 1D  
FIELD NAME: ARCETO  
Cost center: 258303

ARPO 10/C

DATE: 29/08/2002

Test N°: 1

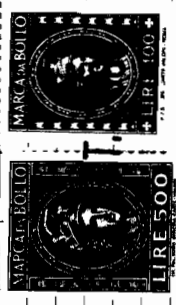
SHORT STRING

SELECTIVE

DUAL COMPLETION

LONG STRING

Time hr : min	Progr. Time min	C.H.I.P. Kg/cm <sup>2</sup>		Choke Size		T.H.P. Kg/cm <sup>2</sup> REL.	T.H.T. °C	Depth m	B.H.P. Kg/cm <sup>2</sup> ASS	B.H.T. °C	Separator Press. PSIG	Temp. °F	RECUP. LIQUIDI		FLUIDO Smc/g	PORTATA GAS	S.G. GAS AIR=1	Remarks		
		Up in	Down in	PARZ. LI PROG. LI	LIQUIDI PROG. LI															
10.05	5	46		3/16		32.60														
10.10	10			3/16		33.20														
10.15	15			3/16		33.50														
10.30	30			3/16		33.30														
11.00	60			3/16		33.20	16				100	70	N/N	N/N	5,800	0.562				
11.30	90	46		3/16		33.00					100	70	NN	NN	5,700	0.562				
12.00	120			3/16		32.60														
12.30	150			3/16		32.30														
13.00	180			3/16		32.10	17				100	70	NN	NN	5,600	0.562				
13.30	210			3/16		31.60														
14.00	240			3/16		31.40					100	70	NN	NN	5,500	0.562				
14.30	270	46		3/16		31.00														
15.00	300			3/16		30.70	18				95	70	NN	NN	5,300	0.562				
15.30	330			3/16		30.40														
16.00	360			3/16		30.00					95	70	NN	NN	5,300	0.562				
16.30	390			3/16		29.60														
17.00	420			3/16		29.20	18				95	70	NN	NN	5,100	0.562				
17.30	450	46		3/16		28.80														
18.00	480			3/16		28.60					95	65	NN	NN	5,000	0.562				
18.30	510			3/16		28.20														
19.00	540			3/16		28.00	19				95	65	NN	NN	4,800	0.562				
19.30	570			3/16		27.70														
20.00	600			3/16		27.50	18				95	65	NN	NN	4,700	0.562				
20.30	630	46		3/16		26.70	17													
21.00	660			3/16		26.80	16				95	65	N/N	N/N	4,600	0.562				
21.30	690			3/16		26.50														
22.00	720			3/16		26.10					95	65	N/N	N/N	4,300	0.562				
22.30	750			3/16		26.20														
23.00	780			3/16		25.50					95	65	N/N	N/N		0.562				
23.30	810	46		3/16		25.60														
0.00	840			3/16		25.20	16				95	65	N/N	N/N	4,300	0.562				
																	30/08/2002			



Well Code: \_\_\_\_\_ Test N°: 1 End Date: 28/08/2002

Supervisor: PASQUETTO CARLO (G) - MONTANARI ROBERTO (N)

Supervisor: PASQUETTO CARLO (G) - MONTANARI ROBERTO (N)

Superintendent: SAVI C.



# WELL TEST REPORT

(Record Data)

WELL NAME BERTOLANI 1D  
 FIELD NAME ARCETO  
 Cost center 258303

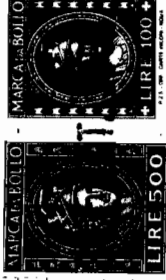
ARPO 10/C

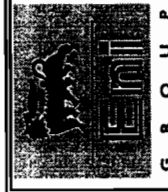
Test N°: 1

DATE: 30/08/2002

G R O U P

Time		Choke Size		T.H.P. Kg/cm <sup>2</sup>	T.H.T. °C	Depth m	B.H.P. Kg/cm <sup>2</sup>		B.H.T. °C	Separator Press. PSIG	Temp. °F	RECUP. LIQUIDI		FLUIDO GAS	PORTATA GAS	S.G. GAS	Remarks
		Up in	Down in				PARZ. LI	LIQUIDI PROG. LI				Smc/g	AIR=1				
0.30	870	46	3/16	25.10	16												
1.00	900		3/16	24.60					95	65	NN			4,200	0.562		
1.30	930		3/16	24.10					95	65	NN			4,100	0.562		
2.00	960		3/16	24.30					75	65	NN			4,100	0.562		
2.30	990		3/16	23.90	16				75	65	NN			4,100	0.562		
3.00	1020	46	3/16	23.60					75	65	NN			4,000	0.562		
3.30	1050		3/16	24.00					75	65	NN			4,000	0.562		
4.00	1080		3/16	23.20					75	65	NN			3,900	0.562		
4.30	1110		3/16	23.60	16				75	65	NN			3,900	0.562		
5.00	1140		3/16	23.00					75	65	NN			3,600	0.562		
5.30	1170		3/16	23.20					90	60	NN			3,600	0.562		
6.00	1200	46	3/16	23.20					90	60	NN			3,600	0.562		
6.30	1230		3/16	23.00	16				90	60	NN			3,600	0.562		
7.00	1260		3/16	22.20					90	60	NN			3,600	0.562		
7.30	1290		3/16	22.30					90	60	NN			3,600	0.562		
8.00	1320		3/16	22.20					90	60	NN			3,600	0.562		
8.30	1350		3/16	22.40	16				90	60	NN			3,600	0.562		
9.00	1380	46	3/16	21.40					90	60	NN			3,600	0.562		
9.30	1410		3/16	22.20					90	60	NN			3,600	0.562		
10.00	1440		3/16	21.60					90	60	NN			3,600	0.562		
10.30	1470		3/16	22.30	16				90	60	NN			3,600	0.562		
11.00	1500		3/16	21.40					90	60	NN			3,600	0.562		
11.30	1530		3/16	21.70					90	60	NN			3,500	0.562		
12.00	1560	46	3/16	21.20					90	60	NN			3,300	0.562		
12.30	1590		3/16	21.00	20				90	60	NN			3,200	0.562		
13.00	1620		3/16	20.60					90	60	NN			3,200	0.562		
13.30	1650		3/16	20.80					90	60	NN			3,200	0.562		
14.00	1680		3/16	20.60					90	60	NN			3,200	0.562		
14.30	1710		3/16	20.00	20				90	60	NN			3,200	0.562		
15.00	1740	20	3/16	19.90					90	70	NN	510	H2O	3,200	0.562	SCARICATO INT. 7" TBG 2 7/8 "	





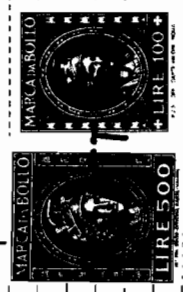
# WELL TEST REPORT

(Record Data)

WELL NAME: BERTOLANI 1D  
FIELD NAME: ARCETO  
Cost center: 258303

DATE: 30/08/2002 Test N°: 1 ARPO 10/C

SINGLE COMPLETION		CHOKE SIZE		T.H.P.		T.H.T.		B.H.P.		B.H.T.		SEPARATOR		RECUP. LIQUIDI		RECUP. LIQUIDI		FLUIDO GAS		PORTATA GAS		S.G. GAS		REMARKS	
Time	Progr. Time	Up	Down	Kg/cm <sup>2</sup>	REL.	°C	m	Kg/cm <sup>2</sup>	ASS	°C	PSIG	°F	PARZ. LI	PROG. LI	Sm <sup>3</sup> /g	Sm <sup>3</sup> /g	AIR=1	Sm <sup>3</sup> /g	Sm <sup>3</sup> /g	Sm <sup>3</sup> /g	Sm <sup>3</sup> /g	Sm <sup>3</sup> /g	Sm <sup>3</sup> /g	Sm <sup>3</sup> /g	Sm <sup>3</sup> /g
15.30	1770	3/16		20.02																					
16.00	1800	20	3/16	19.70		20					85	70	NN			3,100	0.562								
16.30	1830	3/16		20.00							85	70	NN			3,100	0.562								
17.00	1860	3/16		19.50							85	70	NN			3,100	0.562								
17.30	1890	3/16		19.50							85	70	NN			3,100	0.562								
18.00	1920	20	3/16	19.50		20					85	70	NN			3,100	0.562								
18.30	1950	3/16		20.50							85	70	NN			3,500	0.562								
19.00	1980	3/16		22.50							85	70	NN			4,600	0.562								
19.30	2010	3/16		24.80							85	70	NN			4,900	0.562								
20.00	2040	20	3/16	24.50		20					85	70	NN			4,900	0.562								
20.30	2070	3/16		25.30							85	70	NN			4,800	0.562								
21.00	2100	3/16		25.50		17					85	70	NN			4,700	0.562								
21.30	2130	3/16		25.40							85	70	NN			4,600	0.562								
22.00	2160	20	3/16	25.30							85	70	NN			4,400	0.562								
22.30	2190	3/16		24.80							85	70	NN			4,400	0.562								
23.00	2220	3/16		24.60		17					85	70	NN			4,400	0.562								
23.30	2250	3/16		25.50							85	70	NN			4,400	0.562								
0.00	2280	20	3/16	25.00							85	70	NN			4,400	0.562								
0.30	2310	3/16		24.40		16					85	70	NN			4,400	0.562								
1.00	2340	3/16		24.70							85	70	NN			4,400	0.562								
1.30	2370	3/16		24.90		14					85	70	NN			4,400	0.562								
2.00	2400	20	3/16	24.50							85	70	NN			4,400	0.562								
2.30	2430	3/16		24.10							85	70	NN			4,400	0.562								
3.00	2460	3/16		24.20		14					85	70	NN			4,400	0.562								
3.30	2490	3/16		24.40							85	70	NN			4,400	0.562								
4.00	2520	20	3/16	24.10							85	70	NN			4,400	0.562								
4.30	2550	3/16		23.90		14					85	70	NN			4,400	0.562								
5.00	2580	3/16		24.20							85	70	NN			4,400	0.562								
5.30	2610	3/16		23.50							85	70	NN			4,400	0.562								
6.00	2640	20	3/16	23.80		14					85	70	NN			4,400	0.562								





# WELL TEST REPORT

(Record Data)

WELL NAME BERTOLANI 1D  
 FIELD NAME ARCETO  
 Cost center 258303

ARPO 10/C

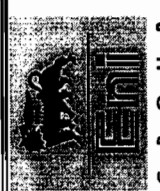
Test N°: 1

DATE: 31/08/2002

SINGLE COMPLETION		DUAL COMPLETION										SELECTIVE	SHORT STRING	LONG STRING	Remarks		
		Prog. Time	C.H.P. Kg/cm <sup>2</sup>	Choke Size Up/Down	T.H.P. Kg/cm <sup>2</sup> REL	T.H.T. °C	Depth m	B.H.P. Kg/cm <sup>2</sup> ASS	B.H.T. °C	Separator Press. PSIG	Temp. °F	RECUP. LIQUIDI PARZ. LI	RECUP. LIQUIDI PROG. LI	FLUIDO GAS Sme/g		PORTATA GAS Sme/g	S.G. GAS AIR-1
6.30	2670		3/16	23.40	14				85	70	N/N		4,300	0.562			
7.00	2700	20	3/16	23.50					85	70	N/N		4,300	0.562			
7.30	2730		3/16	23.20					85	70	N/N		4,300	0.562			
8.00	2760		3/16	22.90					85	70	N/N		4,300	0.562			
8.30	2790		3/16	23.10	16				85	70	N/N		4,300	0.562			
9.00	2820		3/16	23.30					85	70	N/N		4,300	0.562			
9.30	2850		3/16	23.10					85	70	NN		4,300	0.562			
10.00	2880	20	3/16	22.90	20				85	70	NN		4,300	0.562			
10.30	2910		3/16	22.50					85	70	NN		4,300	0.562			
11.00	2940		3/16	22.30					85	70	NN		4,300	0.562			
11.30	2970		3/16	22.90					90	70	NN		4,300	0.562			
12.00	3000		3/16	22.30	20				90	70	NN		4,300	0.562			
12.30	3030		3/16	22.30					90	70	NN		4,300	0.562			
13.00	3060	20	3/16	22.30					90	70	NN		4,300	0.562			
13.30	3090		3/16	22.10					90	70	NN		4,300	0.562			
14.00	3120		3/16	21.80	20				90	70	NN		4,300	0.562			
14.30	3150		3/16	21.70					90	70	NN		4,300	0.562			
15.00	3180		3/16	21.50					90	70	NN		4,200	0.562			
15.30	3210		3/16	21.60					90	70	NN		4,200	0.562			
16.00	3240	20	3/16	21.60	20				90	70	NN		4,200	0.562			
16.30	3270		3/16	21.00					75	70	NN		4,100	0.562			
17.00	3300		3/16	21.10					75	70	NN		4,100	0.562			
17.30	3330		3/16	21.00					75	70	NN		4,100	0.562			
18.00	3360		3/16	21.00	20				75	70	NN		4,100	0.562			
18.30	3390		3/16	20.80					75	70	NN		4,100	0.562			
19.00	3420	20	3/16	20.70					75	70	NN		4,100	0.562			
19.30	3450		3/16	20.80					75	70	NN		4,000	0.562			
20.00	3480		3/16	20.80					75	70	NN		3,900	0.562			
20.30	3510		3/16	20.60					75	70	NN	600	H2O	0.562			
21.00	3540		3/16	20.30					75	70	NN			0.562			



Con operazione w.i. calibrato string @ m 869 : ok.  
 Eseguito profilo din. con fermate a m : 0-247-500-800-860-868  
 ( Emulsione da m 600 a m 868 )



**Spil**

# WELL TEST REPORT

(Record Data)

WELL NAME BERTOLANI 1D  
 FIELD NAME ARCETO  
 Cost center 258303

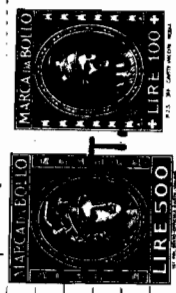
ARPO 10/C

Test N°: 1

DATE: 31/08/2002

Test N°: 1

SINGLE COMPLETION		DUAL COMPLETION		SELECTIVE		SHORT STRING		LONG STRING		Remarks						
Time	hr. min	Prog.	C.H.P.	Choke Size	T.H.P.	T.H.T.	Depth	B.H.P.	B.H.T.		Separator Press.	Temp.	LIQUIDI PARZ.LI	LIQUIDI PROG.LI	FLUIDO GAS Smd/g	PORTATA GAS Smd/g
		Time	Kg/cm <sup>2</sup>	Up Down	Kg/cm <sup>2</sup>	°C	m	Kg/cm <sup>2</sup>	°C	PSIG	°F					
		min	REL	In	ASS			ASS								
21.30	3570	22	20.10	3/16												
22.00	3600		20.10	3/16		17				75	70	NN		3,900		0.562
22.30	3630		19.90	3/16						70	70	NN		3,900		0.562
23.00	3660		19.80	3/16						70	70	NN		3,900		0.562
23.30	3690	22	20.00	3/16						70	70	NN		3,900		0.562
0.00	3720		19.90	3/16		16				70	70	NN		3,900		0.562
1.00	3780		19.60	3/16						70	70	NN		3,900		0.562
2.00	3840		19.40	3/16						70	70	NN		3,900		0.562
3.00	3900	22	19.10	3/16		15				70	70	NN		3,900		0.562
4.00	3960		19.20	3/16						70	70	NN		3,900		0.562
5.00	4020		18.70	3/16						70	70	NN		3,900		0.562
6.00	4080		19.00	3/16						70	70	NN		3,900		0.562
7.00	4140	22	18.70	3/16		15				70	70	NN		3,900		0.562
8.00	4200		18.70	3/16						70	70	NN		4,000		0.562
9.00	4260		18.70	3/16						70	70	NN		3,980		0.562
10.00	4320		18.00	3/16						70	70	NN		4,000		0.562
11.00	4420	22	18.50	3/16		20				65	70	NN		3,900		0.562
12.00	4480		18.20	3/16						65	70	NN		3,900		0.562
13.00	4540		17.70	3/16						65	70	NN		3,900		0.562
14.00	4600		17.50	3/16						65	70	NN		3,900		0.562
15.00	4660	22	17.40	3/16		20				65	70	NN		3,900		0.562
16.00	4720		17.40	3/16						65	70	NN		3,900		0.562
17.00	4780		17.80	3/16						65	70	NN		3,900		0.562
18.00	4840		17.20	3/16						65	70	NN		3,900		0.562
19.00	4900	22	17.10	3/16		19				60	70	20	620	3,900		0.562
20.00	4960		17.10	3/16						65	70	NN		3,800		0.562
21.00	5020		16.80	3/16						65	70	NN		3,700		0.562
22.00	5080		16.60	3/16						65	70	NN	620	3,900		0.562
23.00	5140	22	16.50	3/16		16				65	70	NN	620	3,700		0.562
0.00	5200		16.30	3/16						65	70	NN	620	3,700		0.562





# WELL TEST REPORT

(Record Data)

WELL NAME BERTOLANI 1D  
 FIELD NAME ARCETO  
 Cost center 258303

ARPO 10/C

Test N°: 1

DATE: 02/09/2002

G R O U P

SINGLE COMPLETION		DUAL COMPLETION		SELECTIVE		SHORT STRING		LONG STRING		Remarks								
Time	Prog. Time	C.H.P. Kg/cm <sup>2</sup>	Choke Size	Up	Down	T.H.P. Kg/cm <sup>2</sup>	T.H.T. °C	Depth m	B.H.P. Kg/cm <sup>2</sup>		B.H.T. °C	Separator Press. PSIG	Temp. °F	LIQUIDI PARZ. LI	LIQUIDI RECUP. PARZ. LI	FLUIDO GAS Sm <sup>3</sup> /g	PORTATA GAS Sm <sup>3</sup> /g	S.G. GAS AIR=1
1.00	5260	22	3/16			16.30	15											
2.00	5290		3/16			16.10					65	70	N/N		3,700		0.562	
3.00	5320		3/16			16.10					65	70	N/N		3,900		0.562	
4.00	5350		3/16			16.50	14				65	70	N/N		3,500		0.562	
5.00	5380	22	3/16			16.00					65	70	N/N		3,200		0.562	
6.00	5410		3/16			15.90					65	70	N/N		3,200		0.562	
7.00	5470		3/16			15.90	16				65	70	30	650			0.562	
8.00	5530		3/16			15.60					60	70	N/N		3,200		0.562	
9.00	5590	22	3/16			15.60					60	70	N/N		3,200		0.562	
10.00	5650/0		1/8			15.60	18											
10.05	5		1/8			17.50												
10.10	10		1/8			18.90												
10.15	15	22	1/8			19.80	18											
10.30	30		1/8			19.90												
10.45	45		1/8			20.50												
11.00	60		1/8			20.70	21				45	70	N/N		1,260		0.562	
12.00	120	22	1/8			22.30					45	70	N/N		1,400		0.562	
13.00	180		1/8			22.70					45	70	N/N		1,400		0.562	
14.00	240		1/8			23.10	22				45	70	N/N		1,400		0.562	
15.00	300		1/8			23.60					45	70	N/N		1,400		0.562	
16.00	360	22	1/8			23.90					45	70	N/N		1,450		0.562	
17.00	420		1/8			24.20	20				45	70	N/N		1,470		0.562	
18.00	480		1/8			24.50					45	70	N/N		1,470		0.562	
19.00	540		1/8			24.70					50	60	NN		1,470		0.562	
20.00	600		1/8			25.00	20				50	60	NN		1,500		0.562	
21.00	660		1/8			25.50					50	60	NN					
22.00	720		1/8			25.70					50	60	NN					
23.00	780		1/8			26.00	17											
0.00	840		1/8			26.20												





**Spil**

# WELL TEST REPORT

(Record Data)

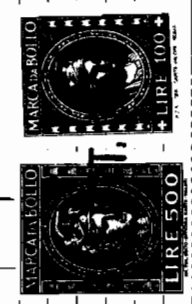
WELL NAME BERTOLANI 1D  
 FIELD NAME ARCETO  
 Cost center 258303

ARPO 10/C

Test N°: 1

DATE: 02/09/2002

Time		C.H.P.		Choke Size	T.H.P. Kg/cm <sup>2</sup>	T.H.T. °C	Depth m	B.H.P. Kg/cm <sup>2</sup>	B.H.T. °C	Separator Press. PSIG	Temp. °F	RECUP. LIQUIDI PARZ. LI	RECUP. LIQUIDI PROG. LI	FLUIDO GAS Smc/g	PORTATA GAS Smc/g	S.G. GAS AIR=1	Remarks
		Up in	Down in														
1.00	900	22	1/8		26.50	15											
2.00	960		1/8		26.70				55	60	N/N			1,600		0.562	
3.00	1020		1/8		27.00				55	60	N/N			1,600		0.562	
4.00	1080		1/8		27.30	14			60	60	N/N			1,700		0.562	
5.00	1140	22	1/8		27.60				60	60	N/N			1,700		0.562	
6.00	1200		1/8		27.80				60	60	N/N			1,700		0.562	
7.00	1260		1/8		28.10	14			60	60	NN					0.562	
8.00	1320		1/8		28.20				60	60	NN					0.562	
9.00	1380		1/8								NN					0.562	
10.00	1440		1/8								NN					0.562	
11.00	1500		1/8								NN					0.562	
12.00	1560/0		1/8								NN	650				0.562	CHIUSO POZZO PER BUILD UP
12.01	1																
12.02	2																
12.03	3																
12.05	5																
12.07	7																
12.10	10																
12.12	12																
12.15	15																
12.30	30																
12.45	45																
13.00	60																



pag. <u>9</u>	Well Code	Test N° <u>1</u>	Supervisor	Supintendent
of <u>9</u>	Start Date <u>28/08/2002</u>	End Date <u>03/08/2002</u>	PASQUETTO CARLO (N) - MONTANARI ROBERTO (G)	SAVI C.



Main Results

Analysis 6

Company Società Petrolifera Italiana S.p.a.  
Well Bertolani 1 Dir

Field Concessione Arceto  
Test Name / # Long Production Test Liv.897-902 m/RT



Test date / time Set-Ott 2002  
 Formation interval Form. Colombacci  
 Perforated interval 897-902 m/RT  
 Gauge type / # Quarzo  
 Gauge depth  
 TEST TYPE Standard  
 Porosity Phi (%) 10  
 Well Radius rw 0.108 m  
 Pay Zone h 5 m  
 Connate Water (%) 20  
 Water Salt (ppm) 36000  
 Rock compr. 4.267E-5 cm<sup>2</sup>/kg  
 Reservoir T 33 °C  
 Reservoir P 109 kg/cm<sup>2</sup>

FLUID TYPE Gas

Gas  
 Gas Gravity 0.56  
 Pseudo-Critical P 47.9883 kg/cm<sup>2</sup>  
 Pseudo-Critical T 189.838 °K  
 Sour gas composition  
 Hydrogen sulphide 0  
 Carbon dioxide 0  
 Nitrogen 0

Water  
 Salinity, ppm 36000  
 WGR 0 m<sup>3</sup>/m<sup>3</sup>

Reservoir T 33 °C  
 Reservoir P 109 kg/cm<sup>2</sup>

Properties @ Reservoir T&P

Gas  
 Z 0.84696  
 Mug 0.014467 cp  
 Bg 0.00851315 cf/scf  
 Cg 0.0101668 cm<sup>2</sup>/kg  
 Rhog 80.567 kg/m<sup>3</sup>

Water  
 Rsw 1.93095 m<sup>3</sup>/m<sup>3</sup>  
 Bw 1.00076 B/STB  
 Cw 4.16659E-5 cm<sup>2</sup>/kg  
 Muw 0.894951 cp  
 Rhow 1026.9 kg/m<sup>3</sup>

Total Compr. ct 0.00818443 cm<sup>2</sup>/kg

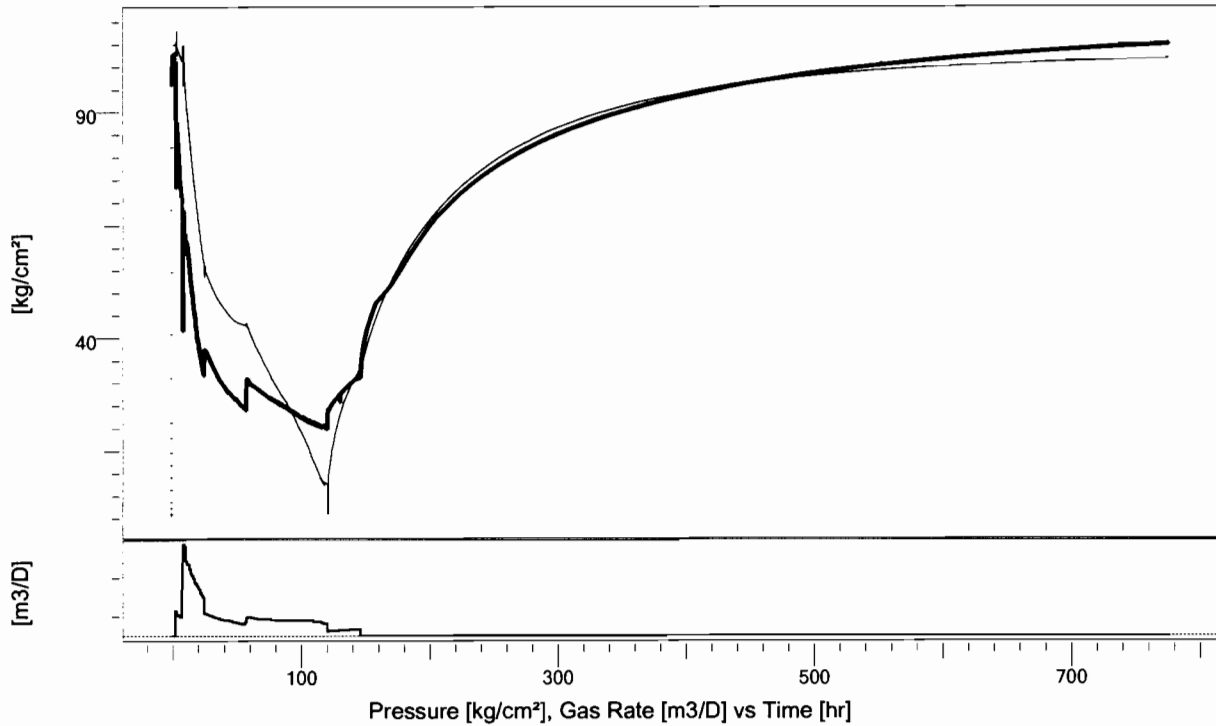
Selected Model  
 Model Option Standard Model  
 Well Storage + Skin  
 WBS Type Changing  
 Reservoir Radial Composite  
 Boundary Infinite

Results

TMatch 38.6 [hr]\*\*-1  
 PMatch 6.15E-16 [Pa/sec]\*\*-1  
 C 1.67 m<sup>3</sup>cm<sup>2</sup>/kg  
 Ci/Cf 715  
 Alpha 1.09E+5  
 skin 7.86  
 Delta P Skin 0.0773231 kg/cm<sup>2</sup>  
 Pi 105 kg/cm<sup>2</sup>  
 k.h 427 md.m  
 k 85.4 md  
 Ri 7.61 m  
 M 644  
 D 1.02





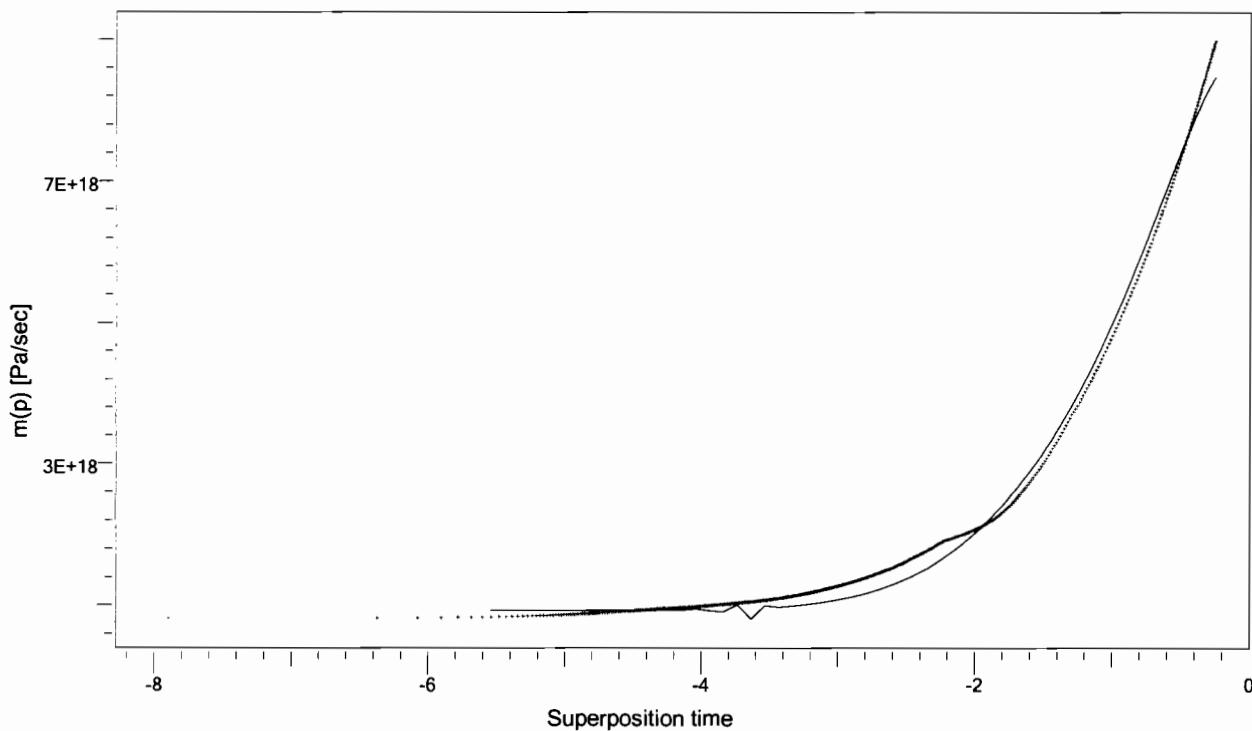


Top Gauge build-up #1  
 Rate 0 m3/D  
 Rate Change 1732 m3/D  
 P@dt=0 31.4 kg/cm²  
 Pi 105 kg/cm²  
 Smoothing 0.25

Selected Model  
 Model Option Standard Model  
 Well Storage + Skin  
 WBS Type Changing  
 Reservoir Radial Composite  
 Boundary Infinite

Results  
 TMatch 38.6 [hr]\*\*-1  
 PMatch 6.15E-16 [Pa/sec]\*\*-1  
 C 1.67 m3cm2/kg  
 Ci/Cf 715  
 Alpha 1.09E+5  
 skin 7.86  
 Delta P Skin 0.0773231 kg/cm²  
 Pi 105 kg/cm²  
 k.h 427 md.m  
 k 85.4 md  
 Ri 7.61 m  
 M 644  
 D 1.02





Top Gauge build-up #1

Rate 0 m3/D  
Rate Change 1732 m3/D  
P@dt=0 31.4 kg/cm<sup>2</sup>  
Pi 105 kg/cm<sup>2</sup>  
Smoothing 0.25

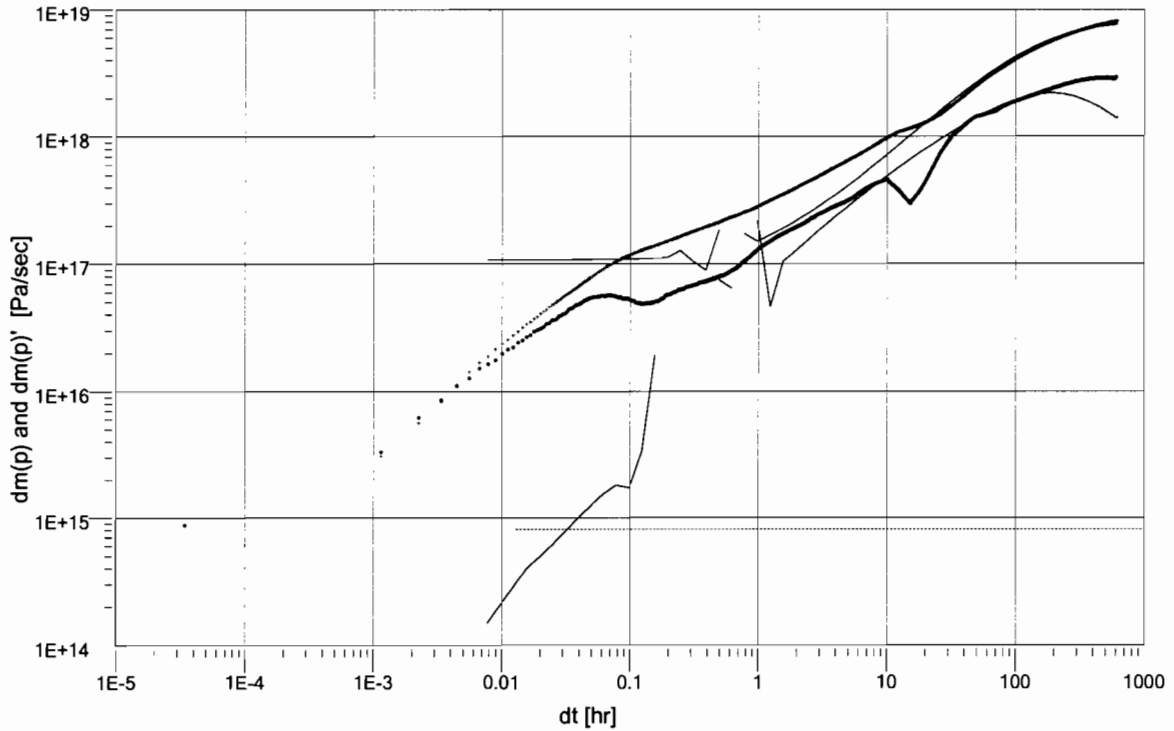
Selected Model

Model Option Standard Model  
Well Storage + Skin  
WBS Type Changing  
Reservoir Radial Composite  
Boundary Infinite

Results

TMatch 38.6 [hr]\*\*-1  
PMatch 6.15E-16 [Pa/sec]\*\*-1  
C 1.67 m3cm2/kg  
Ci/Cf 715  
Alpha 1.09E+5  
skin 7.86  
Delta P Skin 0.0773231 kg/cm<sup>2</sup>  
Pi 105 kg/cm<sup>2</sup>  
k.h 427 md.m  
k 85.4 md  
Ri 7.61 m  
M 644  
D 1.02



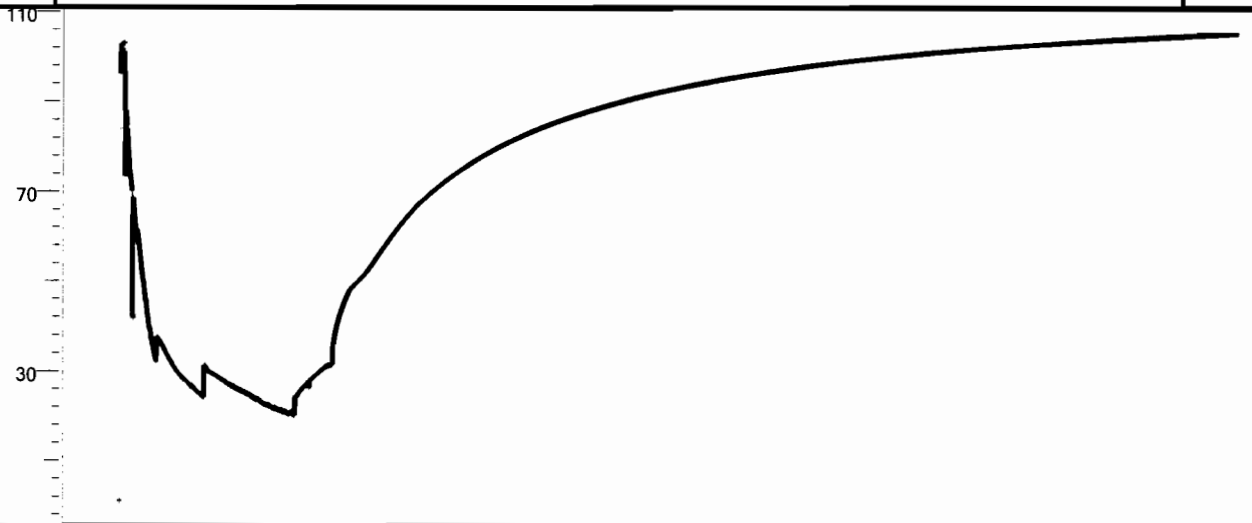


Top Gauge build-up #1  
 Rate 0 m3/D  
 Rate Change 1732 m3/D  
 P@dt=0 31.4 kg/cm<sup>2</sup>  
 Pi 105 kg/cm<sup>2</sup>  
 Smoothing 0.25

Selected Model  
 Model Option Standard Model  
 Well Storage + Skin  
 WBS Type Changing  
 Reservoir Radial Composite  
 Boundary Infinite

Results  
 TMatch 38.6 [hr]\*\*-1  
 PMatch 6.15E-16 [Pa/sec]\*\*-1  
 C 1.67 m3cm2/kg  
 Ci/Cf 715  
 Alpha 1.09E+5  
 skin 7.86  
 Delta P Skin 0.0773231 kg/cm<sup>2</sup>  
 Pi 105 kg/cm<sup>2</sup>  
 k.h 427 md.m  
 k 85.4 md  
 Ri 7.61 m  
 M 644  
 D 1.02





28/08/2002      04/09/2002      11/09/2002      18/09/2002      25/09/2002

Pressure [kg/cm²], Gas Rate [m³/D] vs Time [hr]

**Pressure**

Bottom Gauge (act & ref)

