

Vctor PERALTA

STATIC & FLOWING GRADIENT TEST

COMPANY: PETRO-TECH PERUANA S.A.
WELL: LO16-8
FIELD: LOBITOS OFFSHORE
DATE: FEBRUARY 14th - 15th, 2004

GEOSCIENCES
Central File

MAR. 17, 2004
DATE

GEOSCIENCES
Central File

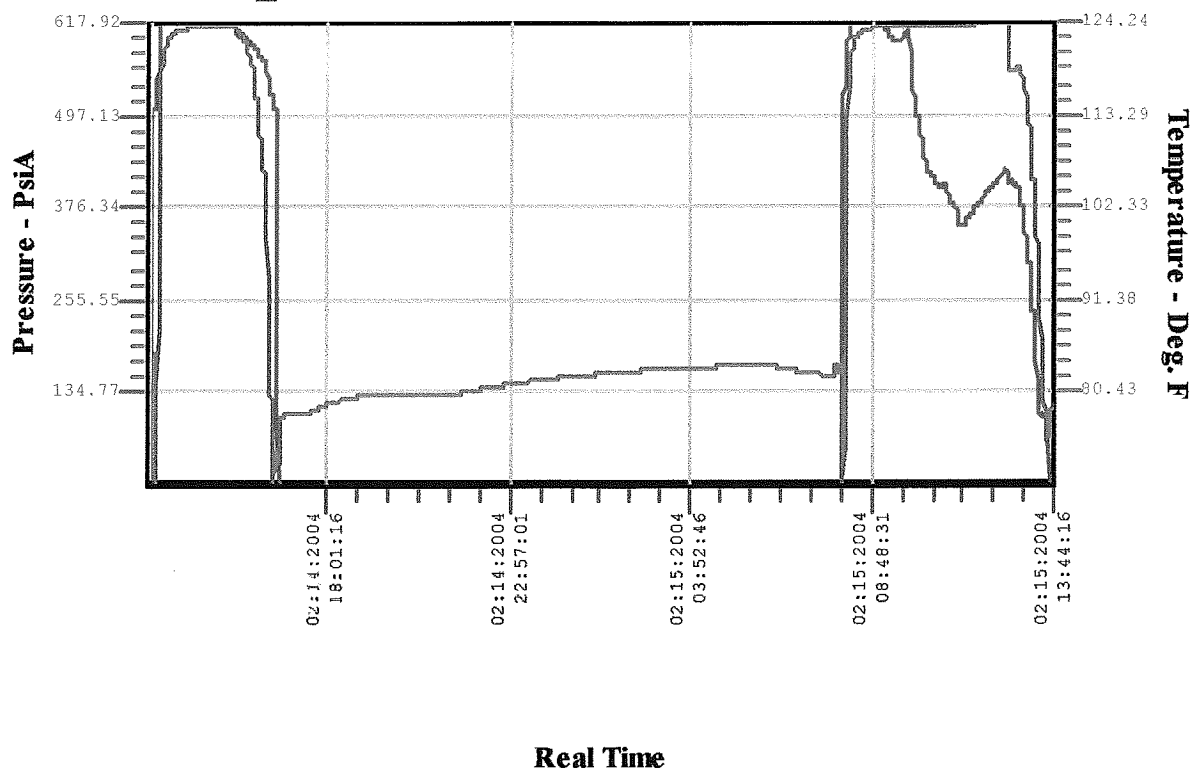
MAR. 17, 2004
DATE

Well Test Data

Test name: FGLO16-8

Company: FLOWPETROL S.A.
Client: PETRO-TECH PERUANA S.A.
Gauge number: 91176
Well name: LO16-8
Well number: 8
Test number: 008
Field name: LOBITOS OFFSHORE
County: TALARA
State: PIURA
Date of test: FEBRUARY
Type of test: STATIC & FLOWING GRADIENT
Well status: SHUT IN
BHP on bottom: 617.90 PSIA (STATIC COND.)
BHP off bottom: 424.99 PSIA (FLOWING COND.)
Bottom gauge number: 91176
Starting tubing pressure: 530 PSIG
Starting casing pressure: 530 PSIG
Ending tubing pressure: 55 PSIG
Ending casing pressure: 120 PSIG
Depth of tool: 8000'
Surface elevation: -
Tool zero point: -
Tubing size: 2 3/8"
Bottom hole temperature: 123.73 deg F
:
:
Test operator: ENG: MARCIAL CACERES
Comments:
:
:

Temperature / Pressure Data



FLOWPETROL S.A. STATIC & FLOWING GRADIENT TEST

Field : Lobitos Offshore
Well : LO16-8

Sand(s) : Basal Salina, Wedge Sand
Interval(s) : (7910' - 8082'), (7162' - 7237')

At Static Condition
Press. Tubing= 530 psig
Press. Ann.= 530 psig

At Flowing Condition
Press. Tubing= 55 psig
Press. Ann.= 120 psig

Well Status : Shut in.
Installation : BLT
Production (BOPD) :
Cumul. (STB) :

FIELD REPORT :

February 09th, 2004

15:15 Rig up.
15:40 Retrieved Standing Valve at 7917'
Detected top at 8108'
16:40 Shut in well x 05 days
P(tubing) = 500 psig
P(annulus) = 500 psig

February 14th, 2004

08:00 Rig up Lubricator and production tubing
13:05 Activate Memory Gauges FPT
13:15 RIH Gauges
13:27 Gauges at 8000' x 03 hrs.
POOH Gauges with steps as follows:
8000' - 7900' - 7800' - 7700' - 7600' - 7500'
7300' - 7100' - 6900' - 6300' - 6000' - 5500'
5000' - 4000' - 3000' - 1500' - 0'
16:34 Gauges on surface.

February 15th, 2004

P(Tubing) = 530 psig
P(Annulus) = 530 psig
08:01 RIH Gauges
08:13 gauges at 8000'
09:05 Bleed off well to separator.
12:27 POOH Gauges with steps at follows:
8000' - 7900' - 7800' - 7700' - 7600' - 7500'
7300' - 7100' - 6900' - 6600' - 6300' - 6000'
5000' - 4000' - 3000' - 1500' - 0'
P(tubing) = 550 psig
P(annulus) = 120 psig
Oil produced = 01 Bls.
13:31 Gauges in Lubricator
14:30 Installed Standing valve at 7917'
15:00 Rig Down.

7162'
Wedge
Sand
7237'

7910'
7910'
8082'

7202' MD (7202' VD)

BK1 at 7887'
Oil Level at 7900'
Seat Niple at 7917'
Basal Salina
Gauge at 8000'
Top at 7920'
F.C : 8193'

7162'
Wedge
Sand
7237'

7910'
7910'
8082'

0.013 psi/ft (q_{oil})

Oil Level (0.013) → 7900' MD (7202' VD)

MAP → 7996' MD (7289' VD) = 618 psi
MIN → 8000' MD (7293' VD) = 618 psi

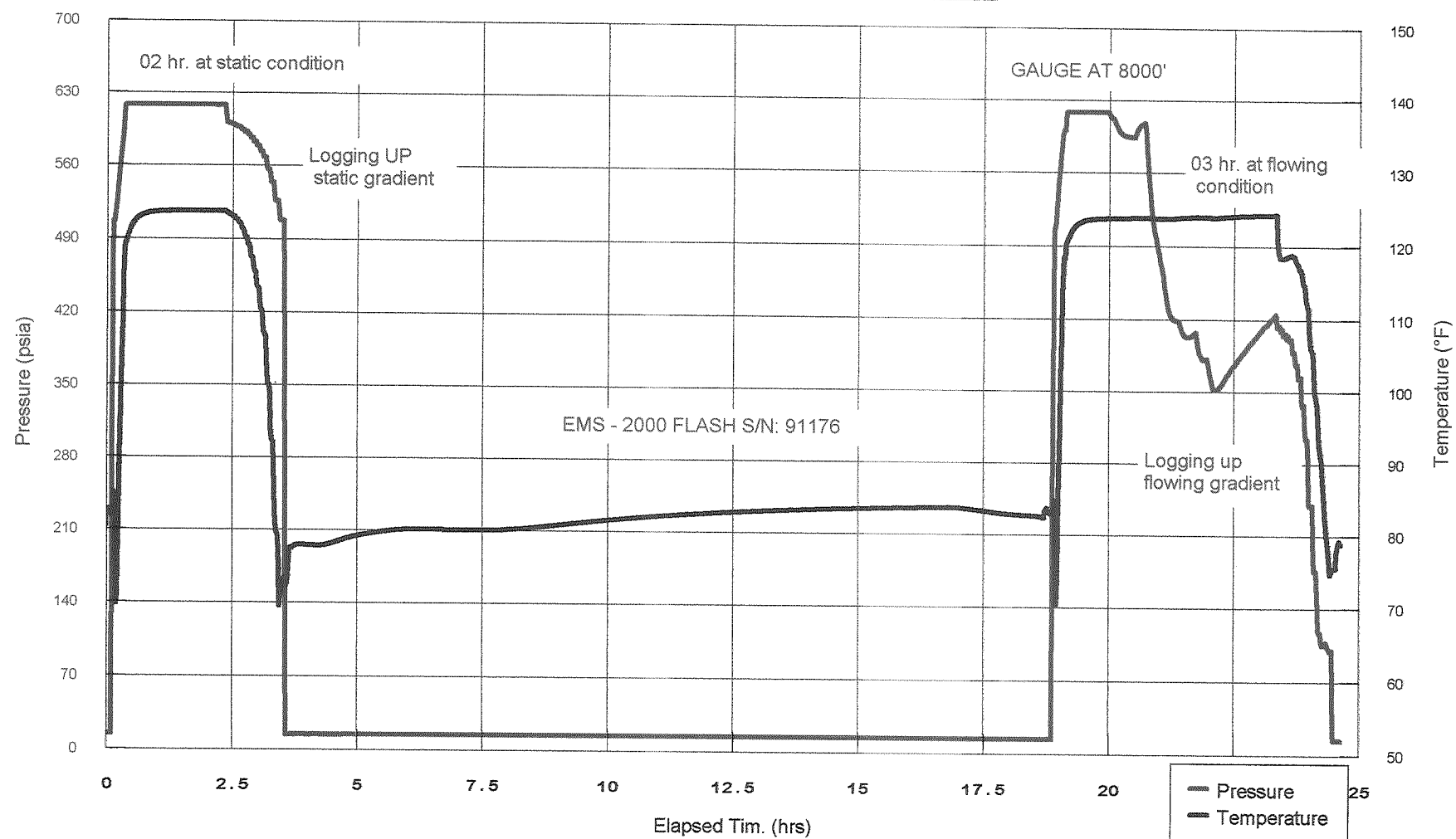
P_{SMI} = 618 psi

F_{GM} = 618 / 7289' VD = 0.085 psi/ft

Field Operator : Abelardo Lopez

Field Supervisor : Marcial Caceres

TEMPERATURE / PRESSURE DATA FLOWING GRADIENT TEST



Summary of Results Well: LO16-8

Date of Test	February 14th-15 th, 2003	
Formation	Basal Salina	(7910' - 8082')
	Wedge Sand	(7162' - 7237')
Depth of gauges	8,000	M.D. ft
	7,251	V.D. ft
<u>01 Hr. at Static Condition</u>		
Well Head Pressure (Tubing)	530.00	psig (Manometer)
Well Head Pressure (Annulus)	530.00	psig (Manometer)
Static Pressure at 8000' MD	617.90	psia (Memory)
Static Temperature at 8000' MD	123.73	°F
Gradient at 8000' MD	0.0852	psi/ft
Oil level	7900	ft. MD
	7165	ft. VD
Water level	7900	ft. MD
	7165	ft. VD
Oil Gradient	0.1925	psi/ft

<u>03 Hrs. at Flowing Condition</u>		
Well Head Pressure (Tubing)	55.00	psig (Manometer)
Well Head Pressure (Annulus)	120.00	psig (Manometer)
Flowing Pressure at 8000' MD	424.99	psia (Memory)
Flowing Temperature at 8000' MD	124.24	°F
Gradient at 8000' MD	0.0586	psi/ft
Oil level	7900	ft. MD
	7165	ft. VD
Wet Gas level	3094	ft. MD
	2932	ft. VD
Oil Gradient	0.1280	psi/ft
Wet Gas Gradient	0.0700	psi/ft

Fluid Level at Static Condition (while POOH gauges)

Measured depth (ft)	Vertical depth (ft)	Pressure (psia)	Gradient (psi/ft)
0	0.00	507.18	
1500	1449.95	526.04	0.0130
3000	2845.13	543.92	0.0128
4000	3769.92	556.01	0.0131
5000	4658.72	567.75	0.0132
5500	5098.15	573.48	0.0130
6000	5528.67	579.07	0.0130
6300	5787.03	582.46	0.0131
6600	6045.40	586.00	0.0137
6900	6303.76	589.52	0.0136
7100	6476.00	591.86	0.0136
7300	6648.24	594.23	0.0138
7500	6820.48	596.60	0.0138
7600	6906.60	597.75	0.0134
7700	6992.73	598.96	0.0141
7800	7078.85	600.13	0.0136
7900	7164.97	601.32	0.0138
8000	7251.09	617.90	0.1925

Levels & Gradients

Static levels			
	Measured (ft)	Vertical (ft)	Gradient (psi/ft)
Gas =	0	0	0.0130
Oil =	7900	7165	0.1925
Gauges =	8000	7251	0.0852

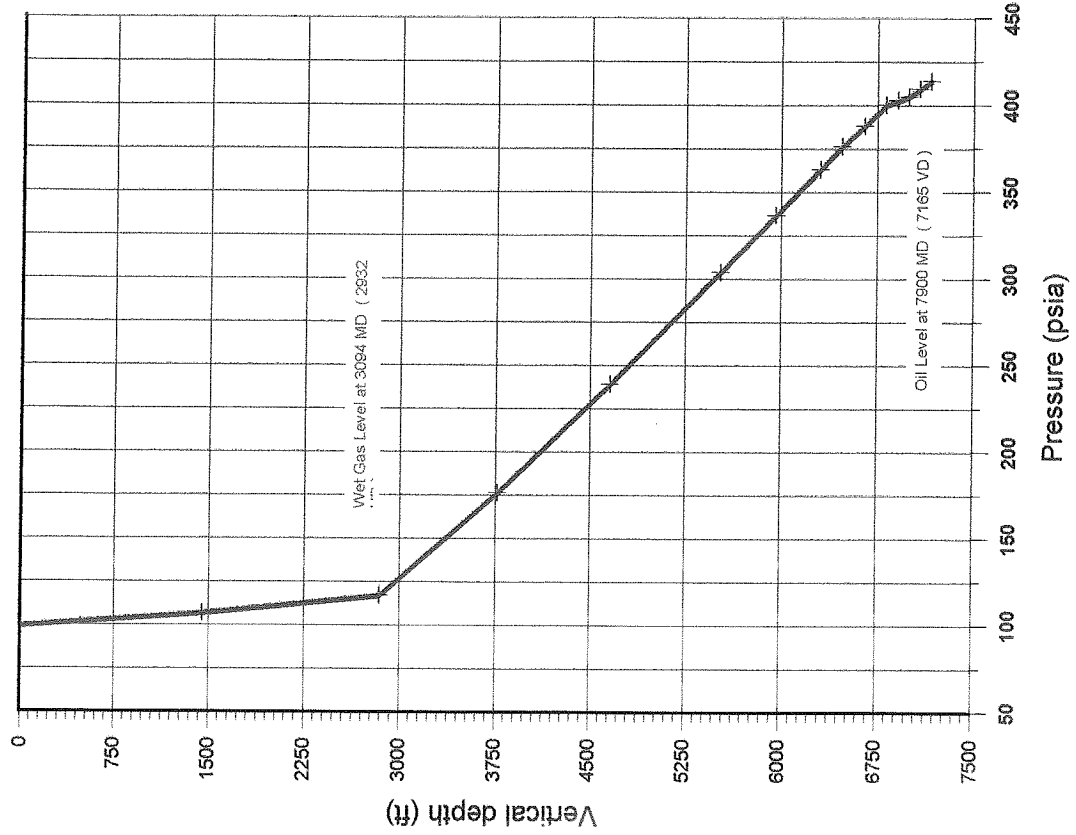
Fluid Level at Flowing Condition (while POOH gauges)

Measured depth (ft)	Vertical depth (ft)	Pressure (psia)	Gradient (psi/ft)
0	0.00	99.49	
1500	1449.95	106.78	0.0050
3000	2845.13	117.09	0.0074
4000	3769.92	176.27	0.0640
5000	4658.72	239.08	0.0707
6000	5528.67	303.93	0.0745
6500	5959.27	336.70	0.0761
6900	6303.76	363.12	0.0767
7100	6476.00	376.25	0.0762
7300	6648.24	387.97	0.0680
7500	6820.48	400.34	0.0718
7600	6906.60	402.60	0.0262
7700	6992.73	404.87	0.0264
7800	7078.85	409.41	0.0527
7900	7164.97	413.97	0.0529
8000	7251.09	424.99	0.1280

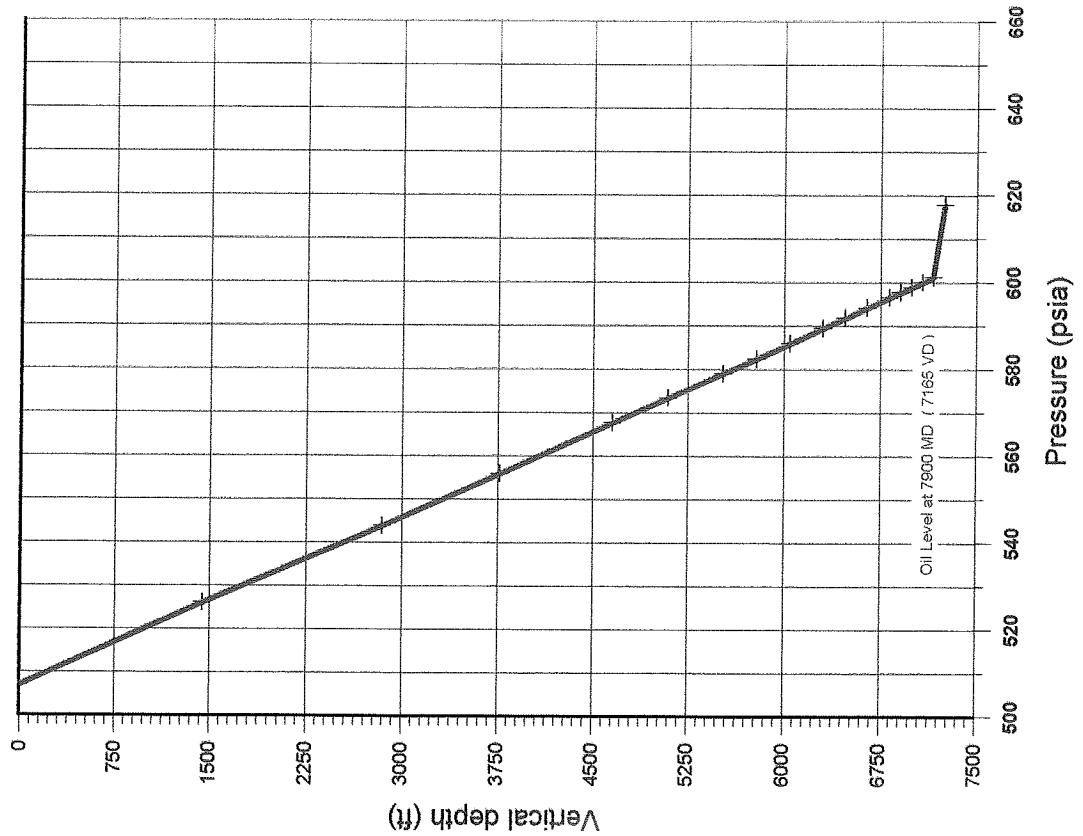
Levels & Gradients

Flowing levels			
	Measured (ft)	Vertical (ft)	Gradient (psi/ft)
Gas =	0	0	0.0062
Wet Gas =	3094	2932	0.0700
Oil =	7900	7165	0.1280
Gauges =	8000	7251	0.0586

Fluid Level at Flowing Condition (while POOH gauges)



Fluid Level at Static Condition (while POOH gauges)



Well LO16-8: Development Test

DATE

Date	Time	Elapsed Time (hrs)	Pressure (psia)	Temperature (°F)	Date	Time	Elapsed Time (hrs)	Pressure (psia)	Temperature (°F)
Activate Gauge s/n: 91176					02/14/2004	14:01:16	0.92917	617.83	123.52
02/14/2004	13:05:31	0.00000	14.70	80.48	02/14/2004	14:02:16	0.94583	617.82	123.53
02/14/2004	13:05:32	0.00028	14.76	80.52	02/14/2004	14:03:16	0.96250	617.84	123.55
02/14/2004	13:05:33	0.00056	14.73	80.55	02/14/2004	14:04:16	0.97917	617.79	123.58
02/14/2004	13:05:34	0.00083	14.69	80.57	02/14/2004	14:05:16	0.99583	617.82	123.57
02/14/2004	13:05:35	0.00111	14.82	80.59	02/14/2004	14:06:16	1.01250	617.82	123.58
02/14/2004	13:05:36	0.00139	14.77	80.60	02/14/2004	14:07:16	1.02917	617.81	123.59
02/14/2004	13:05:37	0.00167	14.78	80.61	02/14/2004	14:08:16	1.04583	617.80	123.60
02/14/2004	13:05:38	0.00194	14.68	80.63	02/14/2004	14:09:16	1.06250	617.82	123.61
02/14/2004	13:05:39	0.00222	14.70	80.64	02/14/2004	14:10:16	1.07917	617.86	123.62
02/14/2004	13:05:40	0.00250	14.48	80.66	02/14/2004	14:11:16	1.09583	617.81	123.62
02/14/2004	13:05:41	0.00278	14.82	80.68	02/14/2004	14:12:16	1.11250	617.77	123.62
02/14/2004	13:05:42	0.00306	14.33	80.68	02/14/2004	14:13:16	1.12917	617.80	123.63
02/14/2004	13:05:43	0.00333	14.65	80.70	02/14/2004	14:14:16	1.14583	617.76	123.63
02/14/2004	13:05:44	0.00361	14.68	80.71	02/14/2004	14:15:16	1.16250	617.81	123.64
02/14/2004	13:05:45	0.00389	14.60	80.72	02/14/2004	14:16:16	1.17917	617.82	123.64
02/14/2004	13:05:46	0.00417	14.73	80.74	02/14/2004	14:17:16	1.19583	617.77	123.65
02/14/2004	13:05:47	0.00444	14.95	80.78	02/14/2004	14:18:16	1.21250	617.80	123.65
02/14/2004	13:05:48	0.00472	14.97	80.82	02/14/2004	14:19:16	1.22917	617.78	123.65
02/14/2004	13:05:49	0.00500	15.00	80.83	02/14/2004	14:20:16	1.24583	617.78	123.66
02/14/2004	13:05:50	0.00528	15.06	80.86	02/14/2004	14:21:16	1.26250	617.81	123.66
02/14/2004	13:05:51	0.00556	14.83	80.88	02/14/2004	14:22:16	1.27917	617.82	123.66
02/14/2004	13:05:52	0.00583	15.06	81.01	02/14/2004	14:23:16	1.29583	617.80	123.66
02/14/2004	13:05:53	0.00611	14.95	81.10	02/14/2004	14:24:16	1.31250	617.78	123.67
02/14/2004	13:05:54	0.00639	14.61	81.21	02/14/2004	14:25:16	1.32917	617.78	123.67
02/14/2004	13:05:55	0.00667	14.82	81.23	02/14/2004	14:26:16	1.34583	617.78	123.67
02/14/2004	13:05:56	0.00694	14.43	81.25	02/14/2004	14:27:16	1.36250	617.80	123.67
02/14/2004	13:05:57	0.00722	14.56	81.27	02/14/2004	14:28:16	1.37917	617.78	123.67
02/14/2004	13:05:58	0.00750	14.52	81.29	02/14/2004	14:29:16	1.39583	617.80	123.68
02/14/2004	13:05:59	0.00778	14.53	81.31	02/14/2004	14:30:16	1.41250	617.78	123.68
02/14/2004	13:06:00	0.00806	14.62	81.32	02/14/2004	14:31:16	1.42917	617.76	123.68
02/14/2004	13:06:01	0.00833	14.69	81.34	02/14/2004	14:32:16	1.44583	617.81	123.68
02/14/2004	13:06:02	0.00861	14.69	81.38	02/14/2004	14:33:16	1.46250	617.80	123.68
02/14/2004	13:06:03	0.00889	14.53	81.43	02/14/2004	14:34:16	1.47917	617.75	123.68
02/14/2004	13:06:04	0.00917	14.69	81.50	02/14/2004	14:35:16	1.49583	617.77	123.68
02/14/2004	13:06:05	0.00944	14.58	81.57	02/14/2004	14:36:16	1.51250	617.76	123.68
02/14/2004	13:06:16	0.01250	14.61	82.02	02/14/2004	14:37:16	1.52917	617.75	123.69
02/14/2004	13:07:16	0.02917	14.69	82.41	02/14/2004	14:38:16	1.54583	617.75	123.69
02/14/2004	13:08:16	0.04583	14.61	82.75	02/14/2004	14:39:16	1.56250	617.79	123.69
02/14/2004	13:09:16	0.06250	14.60	82.29	02/14/2004	14:40:16	1.57917	617.74	123.69
02/14/2004	13:10:16	0.07917	14.54	82.07	02/14/2004	14:41:16	1.59583	617.76	123.69
02/14/2004	13:11:16	0.09583	14.56	81.94	02/14/2004	14:42:16	1.61250	617.78	123.69
02/14/2004	13:12:16	0.11250	14.55	81.85	02/14/2004	14:43:16	1.62917	617.79	123.69
Presurized Lubricator					02/14/2004	14:44:16	1.64583	617.75	123.70
02/14/2004	13:13:16	0.12917	472.11	82.41	02/14/2004	14:45:16	1.66250	617.77	123.70
02/14/2004	13:14:16	0.14583	506.57	85.10	02/14/2004	14:46:16	1.67917	617.76	123.70
02/14/2004	13:15:16	0.16250	506.67	84.89	02/14/2004	14:47:16	1.69583	617.75	123.70
RIH Gauges					02/14/2004	14:48:16	1.71250	617.78	123.70
02/14/2004	13:16:16	0.17917	510.96	77.36	02/14/2004	14:49:16	1.72917	617.73	123.70
02/14/2004	13:17:16	0.19583	519.56	69.79	02/14/2004	14:50:16	1.74583	617.74	123.70
02/14/2004	13:18:16	0.21250	528.28	71.16	02/14/2004	14:51:16	1.76250	617.73	123.70
02/14/2004	13:19:16	0.22917	537.41	75.69	02/14/2004	14:52:16	1.77917	617.76	123.70
02/14/2004	13:20:16	0.24583	546.23	81.69	02/14/2004	14:53:16	1.79583	617.80	123.71
02/14/2004	13:21:16	0.26250	554.91	87.65	02/14/2004	14:54:16	1.81250	617.78	123.71
02/14/2004	13:22:16	0.27917	563.11	92.92	02/14/2004	14:55:16	1.82917	617.78	123.71
02/14/2004	13:23:16	0.29583	571.02	98.34	02/14/2004	14:56:16	1.84583	617.75	123.71
02/14/2004	13:24:16	0.31250	579.33	103.77	02/14/2004	14:57:16	1.86250	617.74	123.71
02/14/2004	13:25:16	0.32917	588.33	109.05	02/14/2004	14:58:16	1.87917	617.75	123.71
02/14/2004	13:26:16	0.34583	597.10	114.53	02/14/2004	14:59:16	1.89583	617.76	123.71
02/14/2004	13:27:16	0.36250	617.21	118.60	02/14/2004	15:00:16	1.91250	617.75	123.71
Gauges at 8000' x 02 hrs.					02/14/2004	15:01:16	1.92917	617.74	123.71
02/14/2004	13:28:16	0.37917	617.87	119.45	02/14/2004	15:02:16	1.94583	617.73	123.71
02/14/2004	13:29:16	0.39583	617.89	119.64	02/14/2004	15:03:16	1.96250	617.76	123.71
02/14/2004	13:30:16	0.41250	617.92	120.00	02/14/2004	15:04:16	1.97917	617.74	123.71
02/14/2004	13:31:16	0.42917	617.91	120.41	02/14/2004	15:05:16	1.99583	617.73	123.71
02/14/2004	13:32:16	0.44583	617.90	120.78	02/14/2004	15:06:16	2.01250	617.74	123.71
02/14/2004	13:33:16	0.46250	617.88	121.10	02/14/2004	15:07:16	2.02917	617.75	123.71
02/14/2004	13:34:16	0.47917	617.90	121.38	02/14/2004	15:08:16	2.04583	617.73	123.71
02/14/2004	13:35:16	0.49583	617.87	121.63	02/14/2004	15:09:16	2.06250	617.74	123.71
02/14/2004	13:36:16	0.51250	617.92	121.86	02/14/2004	15:10:16	2.07917	617.74	123.71
02/14/2004	13:37:16	0.52917	617.89	122.06	02/14/2004	15:11:16	2.09583	617.73	123.72
02/14/2004	13:38:16	0.54583	617.86	122.22	02/14/2004	15:12:16	2.11250	617.73	123.72
02/14/2004	13:39:16	0.56250	617.88	122.37	02/14/2004	15:13:16	2.12917	617.72	123.72
02/14/2004	13:40:16	0.57917	617.85	122.50	02/14/2004	15:14:16	2.14583	617.73	123.72
02/14/2004	13:41:16	0.59583	617.85	122.62	02/14/2004	15:15:16	2.16250	617.72	123.72
02/14/2004	13:42:16	0.61250	617.86	122.73	02/14/2004	15:16:16	2.17917	617.76	123.72
02/14/2004	13:43:16	0.62917	617.86	122.83	02/14/2004	15:17:16	2.19583	617.72	123.72
02/14/2004	13:44:16	0.64583	617.86	122.91	02/14/2004	15:18:16	2.21250	617.70	123.72
02/14/2004	13:45:16	0.66250	617.89	122.98	02/14/2004	15:19:16	2.22917	617.74	123.72
02/14/2004	13:46:16	0.67917	617.85	123.05	02/14/2004	15:20:16	2.24583	617.72	123.72
02/14/2004	13:47:16	0.69583	617.84	123.11	02/14/2004	15:21:16	2.26250	617.74	123.72
02/14/2004	13:48:16	0.71250	617.87	123.16	02/14/2004	15:22:16	2.27917	617.74	123.72
02/14/2004	13:49:16	0.72917	617.83	123.20	02/14/2004	15:23:16	2.29583	617.72	123.72
02/14/2004	13:50:16	0.74583	617.83	123.25	02/14/2004	15:24:16	2.31250	617.71	123.72
02/14/2004	13:51:16	0.76250	617.83	123.29	02/14/2004	15:25:16	2.32917	617.74	123.72
02/14/2004	13:52:16	0.77917	617.85	123.32	02/14/2004	15:26:16	2.34583	617.72	123.72
02/14/2004	13:53:16	0.79583	617.82	123.36	02/14/2004	15:27:16	2.36250	617.90	123.73
02/14/2004	13:54:16	0.81250	617.85	123.39	POOH Gauges				
02/14/2004	13:55:16	0.82917	617.82	123.41	02/14/2004	15:28:16	2.37917	611.25	123.72
02/14/2004	13:56:16	0.84583	617.85	123.44	Step at 7900'				
02/14/2004	13:57:16	0.86250	617.82	123.46	02/14/2004	15:29:16	2.39583	601.29	123.55
02/14/2004	13:58:16	0.87917	617.78	123.47	02/14/2004	15:30:16	2.41250	601.32	123.50
02/14/2004	13:59:16	0.89583	617.79	123.49	02/14/2004	15:31:16	2.42917	601.34	123.47
02/14/2004	14:00:16	0.91250	617.81	123.51	Step at 7800'				

ANEXO 3

WELL TESTING PROCEDURE

GEOSCIENCES Central Pt.
DATE

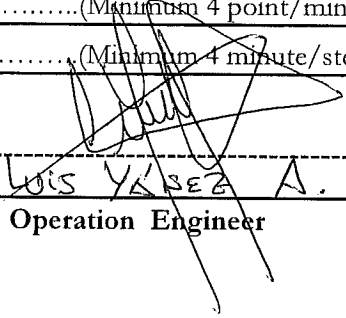
Well	L016-8
Type	FLOWING GRADIENT
Shut in time before test	5 DAYS

Area	LOBITOS OFFSHORE
Formation Test:	B.S.
Interval	B.S.

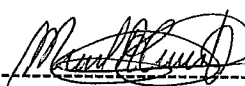
Stages job	Flowing gradient		Static gradient		Build Up	
	Yes	No	Yes	No	Yes	No
Cut paraffin		—				
Fish standing valve	X					
Sand top	X					
Logging down flowing gradient		—				
Logging up flowing gradient	X					
Recording bottom hole pressure flowing by 03 hrs						
Recording Build Up pressure by hrs		—				
Recording bottom hole pressure static by 02 hrs.						
Logging down static gradient	X					
Logging up static gradient		—				
Take measure well head pressure (tubing/annulus)	X					
Reset standing valve	X					

Project to be charged : Monitoring Well

Gauge depth @ 8000' feet.
Sampling rate.....(Minimum 4 point/minute)
Step reading time.....(Minimum 4 minute/step)



 LUIS YÁÑEZ A.
 Operation Engineer



 MARCIAL CÁCERES BUSTAMANTE
 Wireline Supervisor