

BELCO PETROLEUM

CORPORATION OF PERU
(SUCURSAL DEL PERU)

TELEF. — NEGRITOS
863-864-865

WELL FILE

BELCO PETROLEUM CORP. OF PERU
DPTO. TECNICO
26 DIC. 1984
RECIBIDO

APARTADO N° 1
TALARA-PERU

December 18, 1984.-
E- 167, 1984.-

To : Drilling and Production Superintendents
From : Petroleum Engineering
Ref : Completion Program
Well : Z2A-21-592-D-L06 (L06-18)
Lobitos - Offshore

Attached you will find the Completion Program for well L06-18, which will be completed in the Rio Bravo formation (6066'-4626').

Completion program for this well can be summarized as follows :

- Run and cement 5 1/2" casing at 6200' with cement to $\pm$ 3100'. Cement to be displaced with treated sea water.
- Run GR-CCL- log from 6100'-4000'.
- Perforate 1st. stage and take initial BHP. Then frac the 1st. stage and shoot-frac stages 2 through 4. Frac fluid to be used is gelled sea water with 30 lbs/1000 gal (WG-11).
- Open the well for clean out wide open, to ensure maximum differential pressure for clean out. Then place well on production test. Once well stops producing frac water adjust choke size to optimize production.
- In the event that the well is unable to flow by itself or when production performance indicates so, clean out frac sand and run conventional G/L installation.
- Upon log evaluation Reservoirs - Lima has estimated a stabilized production of 200 - 300 BOPD.

The well does not present any potential sand for later recompletion.

Jose Zamalloa V.
Pet. Ing.

G. Villanueva : Approved
Drlg. Supt.

cc: O.M.

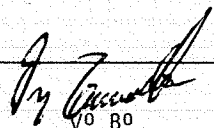
Lima Tech.
Drlg. Spt.
Prod. Spt.
Workover
Geology
Well file

V°B°: Carlos Valdizán M
by Asst. Supt. P.E.

Approved : C. E. Myers
Eng. Supt.



COMPLETION PROCEDURE

WELL	Z2A-21-592-D-L06 OFFICIAL NUMBER	L06-18 BELCO NUMBER	Lobitos AREA	AFE No.
1.- Run and cement the 5 1/2" production casing as per program in attachment # 2. 2.- Install the 10" - 3000# W. P. x 6" - 5000# WP tbgs. head spool with 2"-5000# WP seal wing valves and 6" x 5000# WP ball valve on top as shooting valve. 3.- Run a temperature survey 6 to 12 hrs after plug down to locate the top of the cement. 4.- Run GR-CCL in the interval 6100'-4000'. 5.- Test the shooting valve well head and casing with pressure up to 5000# 24 hrs. after plug down. 6.- Perforate the Rio-Bravo formation in the 1st. stage according to the program in the attachment 3. 7.- Take SI - BHP to record the original pressure of the reservoir only if well head pressure is recorded after perforating. 8.- Frac the first stage according to the program in the attachment # 3. 9.- Shoot frac the rest of the stages according to the program. 10.- Leave the well shut in for about 12 hours after displacement. 11.- Open the well and put it on production for cleaning (wide-open). 12.- Hook-up the well into the production facilities. 13.- Put the well on production test, selecting the optimum choke size. 14.- If the well does not flow by itself a further recommendation to clean out the well and to run gas lift installation will be provided.				
I. Rodriguez ENGINEER		DATE: Dec. 13, 1984. HOUR: 16:45 p.m.	DISTRIBUTION	



CASING AND CEMENT PROGRAM

WELL	Z2A-21-592-D-L06 OFFICIAL NUMBER		L06-18 BELCO NUMBER		Lobitos AREA		AFE No.		
6254 ft. TOTAL DEPTH		5440 ft. TOTAL VERT. DEPTH		36 1/2° MAX ANGLE		33° AVERAGE ANGLE		9 5/8 in at 1515 ft. LAST CASING	
CASING PROGRAM									
CASING DESIGN SIZE : m	SECTION 1	6200-3000 INTERVAL	3200 ft. LENGTH	J-55 GRADE	17 lb/ft WEIGHT	LT&C THREADS			
	SECTION 2	3000-Surface INTERVAL	3000 ft. LENGTH	N-80 GRADE	17 lb/ft WEIGHT	LT&C THREADS			
	SECTION 3	INTERVAL	ft. LENGTH	GRADE	lb/ft WEIGHT	THREADS			
	SECTION 4	INTERVAL	ft. LENGTH	GRADE	lb/ft WEIGHT	THREADS			
FLOAT EQUIPMENT	SHOE	Guide shoe TYPE					6200 ft. DEPTH		
	COLLAR	Differential fill float collar TYPE					6160 ft. DEPTH		
	OTHER	TYPE					DEPTH		
CENTRALIZERS	6160-4000 INTERVAL	EVERY One joint	54 TOTAL	INTERVAL	EVERY	TOTAL			
		EVERY			EVERY				
	INTERVAL		TOTAL	INTERVAL		TOTAL			
	INTERVAL	EVERY	TOTAL	INTERVAL	EVERY	TOTAL			
CEMENTING PROGRAM									
WASHER	Mud flush TYPE	20 VOLUME	bbl	20# MF-1 + 10 gallons Morflo COMPOSITION					
SLURRY 1	350 CEMENT	4 GEL	o/o	1.2% CFR-2 + 0.5 gal/1000 gal	NF-1 ADDITIVE				
	14.1 lb/gal DENSITY	1.55 ft ³ /sx YIELD		7.8 gl/sx WATER REQ	2:30 Hr. Min T.T.	3100 ft EST. TOP			
SLURRY 2	550 CEMENT	Neat cement GEL	o/o	0.5 Halad 9 + 0.5 gal/1000 gal	NF-1 ADDITIVE				
	15.6 lb/gal DENSITY	1.18 ft ³ /sx YIELD		5.2 gl/sx WATER REQ.	2:15 Hr. Min T.T.	4500 ft EST. TOP			
SLURRY 3	 CEMENT	 GEL	 o/o	 ADDITIVE	 ADDITIVE				
	lb/gal DENSITY	ft ³ /sx YIELD		gl/sx WATER REQ.	Hr. Min T.T.	ft EST. TOP			
DISPLACEMENT	144 bbl VOLUME	Sea water FLUID		7-8 RATE	BPM	1600 psi PRESS AT PLUG BUMPING			
WELLHEAD	SIZE 13 3/8" x 9 5/8" x 5 1/2" WORKING PRESSURE : 2000 x 3000 x 5000 psi								
R E M A R K S	* 1 gal of bactericide + 6 gal Fracflo - CS								
	Enviar mud flush								
	Soltar tapón rojo								
	Bombear mezclas de cemento								
	Soltar tapon negro								
	Desplazar tapon con agua + surfactante + bactericida.								
Ivan Rodriguez ENGINEER		V° B°		DATE: HOUR:		DISTRIBUTION			

 PERFORATING AND FRACGING PROGRAM												
WELL		Z2A-21-592-D-L06 OFFICIAL NUMBER			L06-18 BELCO NUMBER		Lobitos AREA		1 STAGE			
Rio Bravo FORMATION		6066'-5546' INTERVAL			100' MD (87' VD) NET SAND			20 SHOTS				
PERFORATING PROGRAM												
PERFORATIONS	6066	5778	5594				CORRECTED COLLARS					
	6059	5752	5554									
	5964	5747	5552									
	5960	5728	5546									
	5937	5655										
	5932	5651										
	5914	5606										
	5908	5600										
PERFORATING GUN		3 3/8" selective fire gun					JETS		TYPE: TRU JET XVI 0.49 ENTRY HOLE: IN			
FRACGING PROGRAM												
FRACGING FLUID		WG-11; 30lbs ADDITIVE			GBW-0.5 lbs ADDITIVE			FRAC-FLO, 1gal ADDITIVE				
		KCl 2% of water weight ADDITIVE			Surflo B-17 3gl/16000 ADDITIVE			ADDITIVE				
		ADDITIVE REQUIRE PER 1000 GLS OF BASE FLUID, UNLESS OTHERWISE IS INDICATED.										
BASIC FRAC STEP	FRACGING FLUID				PROPPANT							
	PRE -- PAD				GLS		MESH		LB / GL		LBS	
	Treated sea water PAD				0 - 9000 GLS		-		-		-	
	Treated sea water CARRY				9000 - 12,500 GLS		20/40 MFSH		1 LB/GL		3500 LBS	
	Treated sea water CARRY				12,500 - 16,000 GLS		20/40 MESH		2 LB/GL		7000 LBS	
	Treated sea water CARRY				16,000 - 19,500 GLS		10/20 MESH		2 LB / GL		7000 LBS	
	Treated sea water CARRY				19,500 - 21,500 GLS		10/20 MESH		3 LB / GL		6000 LBS	
	Treated sea water BLENDER - FLUSH				21,500 - 21,800 GLS		MESH		LB / GL		LBS	
	Treated sea water DISPLACEMENT				5600 GLS		MESH		LB / GL		LBS	
OPERATING CONDITIONS		One TOTAL STEPS		25-30 BPM RATE		3000 psi PRESSURE		5000 psi MAXIMUM PRESSURE				
REMARKS	Proppant concentration : 1.88 lbs/gal 2.7 sx/VNF											

 PERFORATING AND FRACING PROGRAM											
WELL		Z2A-21-592-D-L06 OFFICIAL NUMBER			L06-18 BELCO NUMBER		Lobitos AREA		2 STAGE		
Rio Bravo FORMATION		5374'-5118' INTERVAL			125' MD (108' VD) NET SAND			21 SHOTS			
PERFORATING PROGRAM											
PERFORATIONS	5374	5214	5146				CORRECTED COLLARS				
	5314	5189	5134								
	5309	5185	5130								
	5256	5179	5122								
	5239	5173	5118								
	5235	5161									
	5225	5157									
	5219	5150									
PERFORATING GUN		3 3/8" selective fire gun						JETS		TYPE TRU JET XVI 0/49 ENTRY HOLE: IN	
FRACING PROGRAM											
FRACING FLUID		WG-11, 30 lbs ADDITIVE			GBW; 0.5 lbs ADDITIVE			FRAC-FLO, 1 gal ADDITIVE			
		KCl 2% of water weight ADDITIVE			Surflo B-17 3 gal/16000 ADDITIVE			ADDITIVE			
		ADDITIVE REQUIRE PER 1000 GLS OF BASE FLUID, UNLESS OTHERWISE IS INDICATED.									
BASIC FRAC STEP	FRACING FLUID				PROPPANT						
	PRE -- PAD				GLS		MESH	LB / GL	LBS		
	Treated sea water PAD				0 - 11,000 GLS		MESH	LB / GL	LBS		
	Treated sea water CARRY				11,000 - 15,500 GLS		20/40 MESH	1 LB/GL	4500 LBS		
	Treated sea water CARRY				15,500 - 20,000 GLS		20/40 MESH	2 LB/GL	9000 LBS		
	Treated sea water CARRY				20,000 - 24,500 GLS		10/20 MESH	2 LB / GL	9000 LBS		
	Treated sea water CARRY				24,500-26,500 GLS		10/20 MESH	3 LB / GL	6000 LBS		
	Treated sea water BLENDER - FLUSH				26,500 - 26,800 GLS		MESH	LB / GL	LBS		
	Treated sea water DISPLACEMENT				0 - 5200 GLS		MESH	LB / GL	LBS		
OPERATING CONDITIONS		One TOTAL STEPS		25-30 BPM RATE		3000 PSI PRESSURE		5000 PSI MAXIMUM PRESSURE			
REMARKS	Proppant concentration : 1.839 lbs/gal, 2.64 sx/VNF										

 PERFORATING AND FRACING PROGRAM											
WELL		Z2A-21-592-D-L06 OFFICIAL NUMBER			L06-18 BELCO NUMBER		Lobitos AREA			3 STAGE	
Rio Bravo FORMATION		5092-4994 INTERVAL			104' MD (90' VD) NET SAND			19 SHOTS			
PERFORATING PROGRAM											
PERFORATIONS	5092	5039	4954				CORRECTED COLLARS				
	5088	5035	4948								
	5083	5015	4944								
	5078	5011									
	5074	5006									
	5053	5001									
	5049	4997									
	5043	4958									
PERFORATING GUN		3 3/8" selective fire gun						JETS		TYPE TRU JET XVI 0.49 ENTRY HOLE 1/2 IN	
FRACING PROGRAM											
FRACING FLUID		WG- 11, 30 lbs ADDITIVE			GBW - 0.5 lbs ADDITIVE			FRAC-FLO, 1 gal ADDITIVE			
		KCL 2% of water weight ADDITIVE			Surflo B-17 3 gal/16,000 ADDITIVE			ADDITIVE			
		ADDITIVE REQUIRE PER 1000 GLS OF BASE FLUID, UNLESS OTHERWISE IS INDICATED.									
BASIC FRAC STEP	FRACING FLUID				PROPPANT						
	PRE -- PAD				GLS		MESH	LB / GL	LBS		
	Treated sea water PAD				0 - 9000 GLS		MESH	LB / GL	LBS		
	Treated sea water CARRY				9000 - 12,500 GLS		20/40 MFSH	1 LB/GL	3500 LBS		
	Treated sea water CARRY				12,500 - 16,000 GLS		20/40 MESH	2 LB/GL	7000 LBS		
	Treated sea water CARRY				16,000 - 19,500 GLS		10/20 MESH	2 LB / GL	7000 LBS		
	Treated sea water CARRY				19,500 - 21,500 GLS		10/20 MESH	3 LB / GL	6000 LBS		
	Treated sea water BLENDER - FLUSH				21,500 - 21,800 GLS		MESH	LB / GL	LBS		
	Treated sea water DISPLACEMENT				0 - 4900 GLS		MESH	LB / GL	LBS		
OPERATING CONDITIONS		One TOTAL STEPS		25-30 BPM RATE		3000 PSI PRESSURE		5000 PSI MAXIMUM PRESSURE			
REMARKS	Proppant concentration : 1.88 lbs/gal 2.61 sx/VNF										

 PERFORATING AND FRACGING PROGRAM											
WELL		Z2A-21-592-D-L06 OFFICIAL NUMBER			L06-18 BELCO NUMBER		Lobitos AREA		4 STAGE		
Rio Bravo FORMATION		4868'-4626' INTERVAL			119' MD (105' VD) NET SAND			18 SHOTS			
PERFORATING PROGRAM											
PERFORATIONS	4868	4800	4638				CORRECTED COLLARS				
	4862	4794	4632								
	4856	4788	4626								
	4850	4733									
	4844	4727									
	4822	4700									
	4815	4667									
	4806	4661									
PERFORATING GUN		3 3/8" selective fire gun						JETS		TYPE TRU JET XVI 0.49 ENTRY HOLE IN	
FRACGING PROGRAM											
FRACGING FLUID		WG-11, 30 lbs ADDITIVE			GBW - 0.5 Lbs ADDITIVE			FRAC-FLO, 1 gal ADDITIVE			
		KCl 2% of water weight ADDITIVE			Surflo B-17 3 gal/16,000 ADDITIVE			ADDITIVE			
		ADDITIVE REQUIRE PER 1000 GLS OF BASE FLUID, UNLESS OTHERWISE IS INDICATED.									
BASIC FRAC STEP	FRACGING FLUID				PROPPANT						
	PRE -- PAD				GLS		MESH	LB / GL		LBS	
	Treated sea water PAD				0 - 10,500 GLS		MESH	LB / GL		LBS	
	Treated sea water CARRY				10,500 - 15,000 GLS		20/40 MESH	1 LB/GL		4500 LBS	
	Treated sea water CARRY				15,000 - 19,500 GLS		20/40 MESH	2 LB/GL		9000 LBS	
	Treated sea water CARRY				19,500 - 24,000 GLS		10/20 MESH	2 LB / GL		9000 LBS	
	Treated sea water CARRY				24,000 - 26,000 GLS		10/20 MESH	3 LB / GL		6000 LBS	
	Treated sea water BLENDER - FLUSH				26,000 - 26,300 GLS		MESH	LB / GL		LBS	
	Treated sea water DISPLACEMENT				0 - 4500 GLS		MESH	LB / GL		LBS	
OPERATING CONDITIONS		one TOTAL STEPS		25-30 RATE		3000 psi PRESSURE		5000 psi MAXIMUM PRESSURE			
REMARKS	Proppant concentration : 1.84 lbs/gal; 2.714 sx/VNF.										

FRACGING MATERIALS

WATER	:	120,000 gal
WG-11	:	3,600 lbs.
GBW-3	:	60 Lbs.
FRAC-FLO	:	120 gal
SURFLO B-17	:	25 gal
KCl 2%	:	20,000 LBs
Sand 20/40	:	480 sxs.
Sand 10/20	:	560 sxs.

IR/rzz