

BELCO PETROLEUM

CORPORATION OF PERU
(SUCURSAL DEL PERU)

hch

TELEF. -- NEGROS:
863.884.885

APARTADO. No. 1
TALARA - PERU

WELL FILE

E-045-84
August 13, 1984

BELCO PETROLEUM CORP. OF PERU
DPTO. TECNICO
23 AGO. 1984
RECIBIDO

TO : Drilling Superintendent
FROM : Engineering Superintendent
REF. : Drilling Prognosis for the well Z2A-21-575-D-L06 (L06-21)
Lobitos offshore

file

Please, attached you will find the Drilling Prognosis for the well in reference to be drilled by RIG III to 5600' as total depth.

This program is based on the Geologic Prognosis and data gathered from the correlation wells; L06-16; L06-13x and the L06-24, which were drilled recently by the Rig in reference. In this well the Rio Bravo sands are the objective.

[Signature]
V°B° : José Zamalloa
P.E. Dept. Head

[Signature]
Approved by : Carlos Valdizan
Eng. Spdt. (Acting)

[Signature]
RG/amg

[Signature]
Approved By: Gordon Villanueva
Drlg. Supdt.

CC. Oper. Man.
Lima Technical
Petro-Perú-Lima
Drlg. Supdt. (3)
S.M.D.C.O.
Finance
Well site (2)
Well file



DRILLING PROGNOSIS

WELL	Z2A-21-575-D-L06 OFFICIAL NUMBER	L06-21 BELCO NUMBER	Lobitos offshore AREA	Development TYPE OF WELL	AFE No.
OBJETIVE	PRIMARY Rio Bravo Sands SECONDARY				
RIG: III	National 55-A DRAWWORKS	Gardner Denver PY-7 PUMP No. 1		Gardner Denver PY-7 PUMP No. 2	
DIRECTION OF DEVIATED WELL	S 20° E	ESTIMATED DEVIATION (MAX ANGLE)		ELEVATIONS	K.B. 50
CONDUCTOR SIZE AND ANGLE	18" Vertical	RECOMMENDED K. O. P.			☐ WATER DEPTH 335'
ESTIMATED TOTAL DEPTH	5600 Ft.	ESTIMATED time TO REACH T. D.			☐ GROUND LEVEL
		700 Ft. 18 days			
SURFACE HOLE PROGRAM			BIT SIZE 12 1/4"-17"	CASING POINT 700'	
CASING 13 3/8"; J-55; 54.5 #/Ft; LT&C FLOATING EQUIPMENT		CEMENT SLURRY 1 350 SK(S) of 4% Gel cement SLURRY 2 300 SK(S) of neat cement plus 2% CACL2 SLURRY-1 SLURRY-2		REMARKS - Estimated hole : 20'', from 700' to the mud line. - Cement top : at the mud line.	
CENTRALIZERS One on each of the bottom two joints (3)		DENSITY (lb/gal) 14.1 15.6 YIELD (ft ³ /sx) 1.55 1.18 WAT. REQ (gal/sx) 7.8 5.2 T.T. (hr. min) 1:30 ± 2:00			
INTERMEDIATE HOLE PROGRAM			BIT SIZE 12 1/4"	CASING POINT 1800'	
CASING 9 5/8"; J-55; 40#/Ft; LT&C FLOATING EQUIPMENT Guide Shoe Insert Float Valve CENTRALIZERS One on each of the bottom every two joint (6)		CEMENT SLURRY 1 600 SK(S) of 4% Gel cement SLURRY 2 150 SK(S) of neat cement SLURRY-1 SLURRY-2 DENSITY (lb/gal) 14.1 15.6 YIELD (ft ³ /sx) 1.55 1.18 WAT. REQ. (gal/sx) 7.8 5.2 T.T. (hr. min) ± 2:30'		REMARKS - Estimated hole: ±14'' from the bottom to 13 3/8'' Shoe - Cement top: at surface - Dieplacement: ± 134 Bbls - Bump Plug: ± 1300 PSI - Set a 16'' Ø base plate for the 13 3/8'' casing.	
PRODUCTION HOLE PROGRAM			BIT SIZE 7 7/8"	CASING POINT 5600'	
CASING 5 1/2"; J-55; 17 #/Ft; LT &C FLOATING EQUIPMENT Guide Shoe Diff. fill float collar CENTRALIZERS On the pay zone		CEMENT SLURRY 1 4% Gel cement SLURRY 2 Neat cement to cover the pay zone. SLURRY-1 SLURRY-2 DENSITY (lb/gal) 14.1 15.6 YIELD (ft ³ /sx) 1.55 1.18 WAT. REQ. (gal/sx) 7.8 5.2 T.T. (hr. min)		REMARKS - The final casing, cement and centralizer program will be submitted according with the actual well conditions. - Estimated hole size will be ± 10''. - Cement top at ± 1000' above the top of Rio Bravo formations	
WELLHEAD	SIZE 9 5/8" x 5 1/2" x WORKING PRESSURE 3000-5000 PSI ASSEMBLY				

MUD PROGRAM

SALT SATURATED

MUD TYPE

DEPTH	MUD WEIGHT	FUNNEL VISCOSITY	PLAST VISC.	YIELD POINT	FLUID LOSS	SOLIDS	OIL
(ft.)	(lb/ft)	(sec)	(CP)	(lb/100ft ²)	(cc)	(o/o)	(o/o)
0- 700	8.9- 9.0	46-50	SPUD	MUD - NO CONTROL			
700-1800	9.0- 9.5	38-40	6- 7	9-11	Below 6-8	7- 9	4-6
1800-3300	9.5-10.0	40-42	8-10	12-14	" 5-7	10-12	4-5
3300-5600	10.0-11.0	42-44	9-11	13-15	" 4-6	10-12	4-5

Remarks - Maintain PH around 11.5
 - Maximum pore pressure expected is 1500 PSI at 3400' V.D. (nearby wells)
 - If the gas cut mud, circulate the well ($\pm$ 30') and increase the mud weight only if is strictly necessary. Maximum mud weight was 11.0 PPG in the last well (LOG-16)
 - The mud properties will be changed as well conditions required.

HYDRAULIC PROGRAM

DEPTH	BIT SIZE	NOZZLESS CONVINATION	PUMP PRESS	PUMP LINER	PUMP RATE	ANN PRESS LOSS VEL	BIT
(ft)	(in)	(32 nd)	(psi)	(in)	(gpm)	(FPM)	(psi)
0- 700	17	14-14-13	600- 800	*6	*420	42	720
700-1800	12 1/4	12-12-12	1200-1500	5 1/2	345	85	920
1800-3300	7 7/8	10-10-9	1500	5 1/2	245	135	1200
3300-5600	7 7/8	10-10-11	1500	5 1/2	245	135	1250

REMARKS - *Use both pumps in parallel.
 - Use 130-140 S.P.M.
 - If change the 6" pump liner to 6 1/2", try to increase the pump pressure to 1800 PSI

BIT PROGRAM

BIT No.	BIT SIZE	BIT TYPE	DEPTH OUT	FEET	ROT. TIME	WEIGHT ON BIT	ROTARY SPEED
	(in)	(1 ADC Code)	(ft)	(ft)	(hrs)	(1000 lbs)	(RPM)
*-1	17	R-1	700	315	10-12	15-20	80- 90
**2-3	12 1/4	1-1-4	1800	1100	30-40	25-35	100-110
4- 6	7 7/8	1-1-4	3300	1500	45-55	35-40	100- 90
		1-3-6					
7-12	7 7/8	1-1-4	5600	2300	90-110	35-40	100- 90
		4-3-6					

REMARKS * - One 12 1/4 RR bit to open hole for the 17" bit.
 ** - One or two 7 7/8" bit S(12-13-13) to open hole for 12 1/4" bit.
 - Maintain the hole full on all trips.

August 13, 84
DATE

Raul García
PETROLEUM ENGINEERING

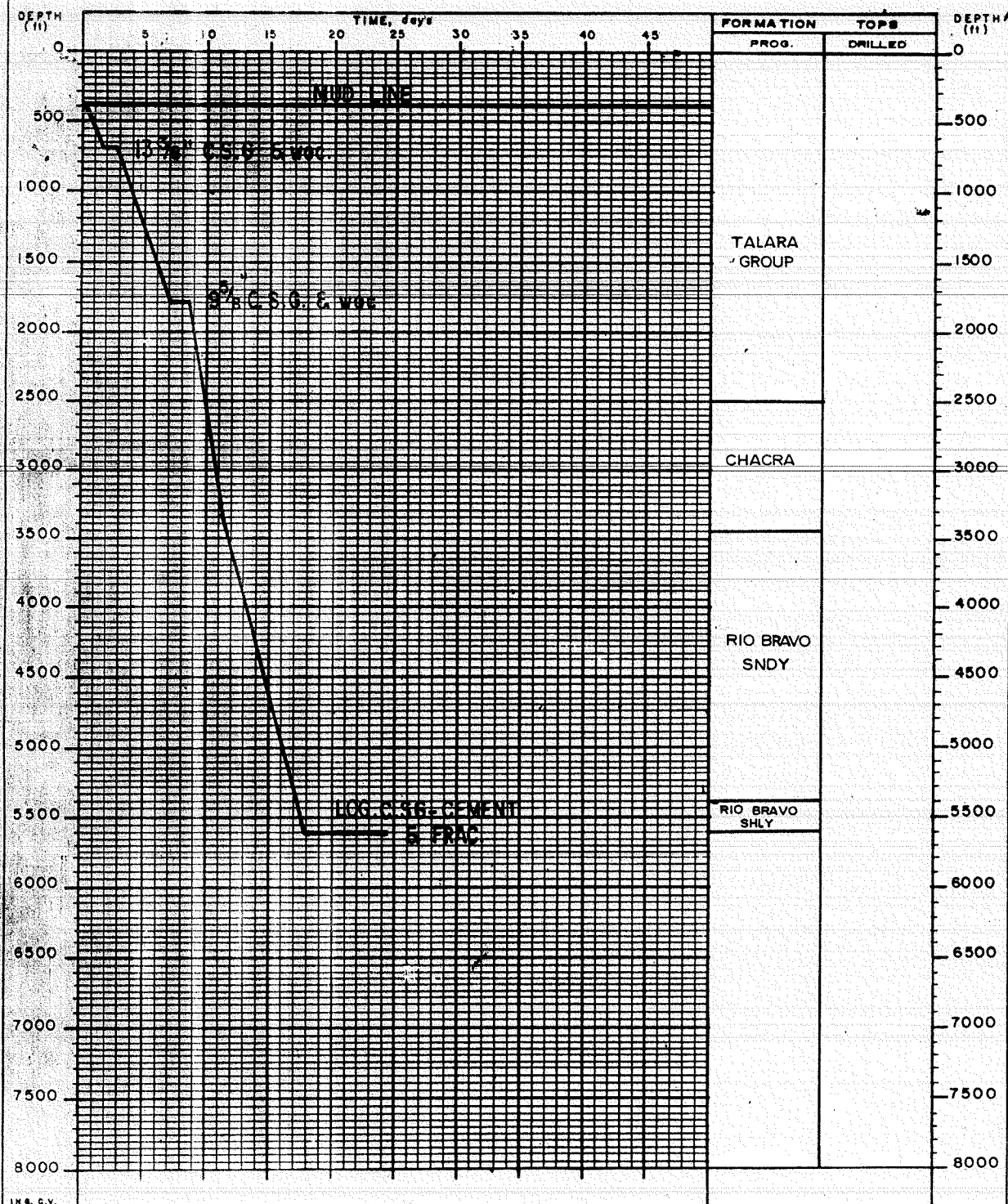
R. García
CHIEF ENGINEER

DRILLING SUPT



DRILLING TIME PROGNOSIS

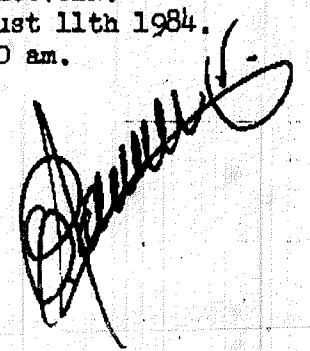
WELL	Z2A-21-575-D-L06 OFFICIAL NUMBER	L06-21 BELCO NUMBER	LOBITOS AREA	DEVELOPMENT TYPE OF WELL	AFE N°
OBJETIVE	PRIMARY RIO BRAVO SANAS SECONDARY				
RIG III	NATIONAL 80-B DRAWWORKS	GARDN. DENVER PY-7 PUMP N°1		GARDN. DENVER PY-7 PUMP N°2	



DATE: AUG. 13, 1984

PREPARED BY: R. GARCIA

B-027

BELCO		GEOLOGIC PROGNOSIS		DISTRIBUTION	
Lobitos Offshore AREA		12-A-21-575-D-106 OFFICIAL WELL NUMBER	L06-21 BELCO 114	TYPE OF WELL	DEVELOPMENT
					RJG Nº III
OBJECTIVE		PRIMARY: Rio Bravo sdy. SECONDARY: -----			
		SURFACE COORDINATES		TARGET COORDINATES	
N 9°508,020.04 1°598,624.04		m, E 459,308.78 124,659.58		N 9°508,730 1°598,340	
m, E 459,390 124,760					
ELEVATIONS	K.B. 50 FT.	DIRECTION OF DEVIATED WELL S 20° °E		DRILLED DEPTH TO TARGET 3450 FT	
	☒ WATER DEPTH	(INITIAL) CONDUCTOR ANGLE FROM VERTICAL VERT. °		TRUE VERTICAL DEPTH TO TARGET 3200 FT.	
	☐ GROUND LEVEL -335 FT.	RECOMMENDED DEPTH OF K.O.P. 700 FT.		EST. DEVIATION (MAX. ANGLE) 25 °	
ESTIMATED FINAL DRILLED DEPTH 5600 FT.		BUILD UP ANGLE AT 4 ° PER 100 FT.		HORIZONTAL DRIFT TO TARGET 1020 FT	
EST. DRILLING TIME TO T.D. 21 DAYS				HORIZONTAL DRIFT TO TOTAL DEPTH 1930 FT.	
EXPECTED STRATIGRAPHIC SEQUENCE	FORMATION / MEMBER		DRILLED TOP	SUBSEA TOP	OBSERVATIONS / POSSIBLE PROBLEMS
	Talará Group		at surface		
	CHACRA		2500	2300	
	Rio Bravo sdy.		3450	3150	PAY ZONE
	Rio Bravo shly.		5400	4930	
	TD.		5600	5100	
CONTROL	TARGET LIMITS	TOP 250 BASE 350	250 350	OBSERVATIONS By radio; M.Ch.8:CEN. August 11th 1984. 9:00 am. 	
	BIT SAMPLES TO BE TAKEN:	EVERY 30 FT. FROM SURF TO 2000 ° AND EVERY 10 FT. FROM 2000 TO TOTAL DEPTH			
	RECOMMEND. FOR PALEO-PALYNOLOGY	At request Geology Supervisor.			
LOGGING	RECOMMENDED OPEN HOLE	DLL-MSFL-GR FDC-CNL-GR			
	RECOMMENDED AFTER CASING	GR-CCL			
	NEARBY WELLS FOR CORRELATION	L06-13X, L06-16, L06-24.			
EVALUATION	SIDEWALL CORES	-----			
	CONVENTIONAL OR ◊ CORES	-----			
	GAS LOGGER	-----			
	FORMATION TESTING	-----			
PREPARED BY: Mario Chavez Cerna. August 10th 1984. DATE			LIMA PERU		APPROVED DATE