

PTP-PERF-077-96

3 March 96

TO : Operations Manager  
FROM : Drilling Manager  
SUBJECT : **DRILLING PROGRAM FOR WELL  
Z-2B-21-031-D-LO6 (LO6-21R)  
SLIM DRILLING PROJECT**



MAL ✓  
HCH ✓  
HC —  
File

Please find enclosed the Drilling Program for well LO6-21R to be drilled by Petrex Rig 114 as part of the Slim Hole Drilling Project in Lobitos area.

The purpose of this drilling project is to test the Basal Salina sands by utilizing the existing wellbore from a previously drilled well, deepening this to a new target.

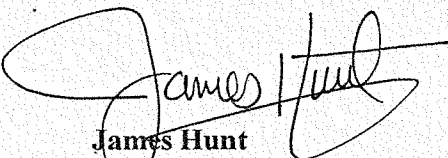
The LO6-21R will be the seventh well of the slim drilling project. It will be drilled below the existing 5 1/2" guide shoe at 5250 ft to a new projected TD of 8720'. Old perforated intervals have been squeezed, but a cement kickoff plug must be set in the rat hole.

The new target lies S 21°W of the platform with a displacement of 3109'. The KOP in this well will be below the 5 1/2" guide shoe at 5300'. It will be necessary to build angle for the first 880' to obtain the 60.64° angle required to reach the target. This will be accomplished using a steerable motor and MWD. After the final direction and angle are attained the motor will be laid down and stabilized rotary assemblies will be used to reach the projected TD.

State of the Art gas chromatography and gas detection equipment as well as a new PVT system will allow us to maintain mud weights at or near the formation balance point at all times. Mud weight will be increased as dictated by well bore conditions. Special caution will be taken at all times to insure wellbore integrity. Sufficient weight material must be stocked at the Rig to raise the mud weight by two pounds.

After the initial cement work necessary to begin operations, the estimated time to drill this well is 20 days plus 8 days for completion.

The expenditure estimated to develop this project will be \$ 754,100 and charged to AFE No. 9622102.

  
James Hunt  
Drilling Manager

c.c.: GOPR/GPEP/PROD/CTBN/Crono./File

## **GENERAL INFORMATION**

Area : Lobitos  
Official Number : Z-2B-21-031-D-LO6 WELL : LO6-21R  
Well Type : Development  
Slim Hole  
AFE : 9622102

### **Geology Recommendation:**

<u>Formation</u>	<u>MD</u>	<u>TVD</u>
Palegreda	5100	4750
Mogollon	5633	5200
San Cristobal	6074	5500
Basal Salina	7351	6130
Balcones	8500	6692
TD	8720	6800

### **Coordinates:**

5 1/2" casing at SHOE : 9,508,540.27 m N, 459,537.91 m E  
Objective : 9,508,076.06 m N, 459,384.98 m E

### **Directional:**

Angle at 5 1/2" Csg Shoe : 25.34°  
Direction at 5 1/2" Shoe : S 08 E  
Measured depth at 5 1/2" Shoe : 5250'  
Measured depth at objective : 7350'  
Vertical depth at objective : 6130'  
Horizontal drift at objective : 3110'  
Maximum vertical angle : 60.64°  
Direction : S 21.06° W  
Total estimated depth : 8720'  
Estimated drilled section (Slim Hole) : 3470'  
Estimated drilled days : 20 days

### **Drilling Rig:**

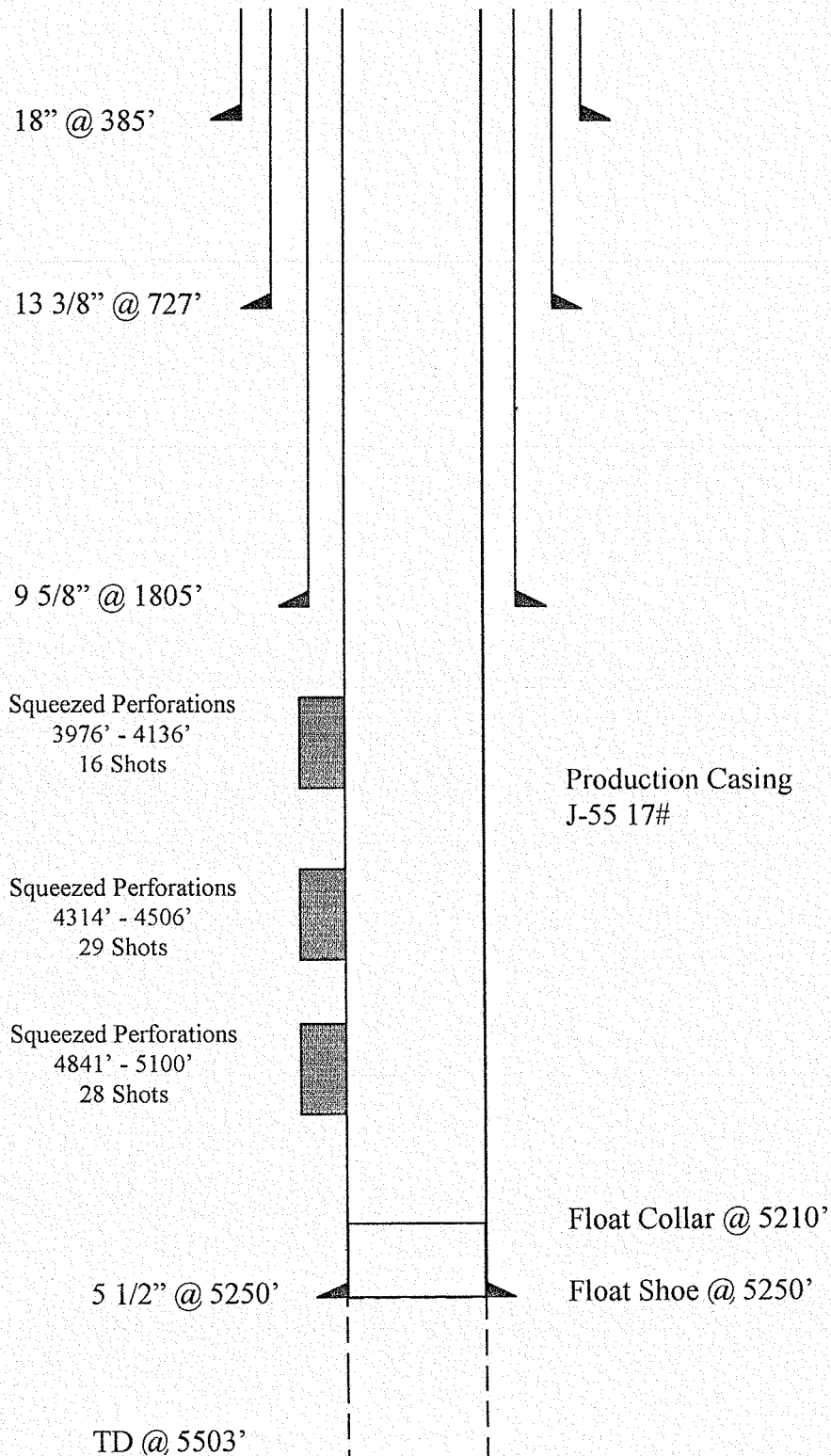
Contractor : PETREX  
Rig : 114  
Draw-work type : Cardwell KT-250  
Pump N° 1 : Gardner Denver PZ-7  
Pump N° 2 : Gardner Denver PZ-7

## **WELL: Z-2B-21-031-D-LO6 (LO6-21R)**

### **WELL HISTORY**

<b>DATA COMPLETION</b>	:	September 8, 1984
<b>FORMATION</b>	:	Rio Bravo
<b>INTERVALS OPENED</b>	:	5100' - 3976'
<b>LAST PRODUCTION</b>	:	06 x 0 (25 August 95)
<b>ACTUAL INSTALLATION</b>	:	No installation, squeezed perfs
<b>PRODUCTION HISTORY</b>	:	Accumulated Oil: 30,219 Bbls. Accumulated Gas: 95,667 Mscf. Accumulated Water: 565 Bbls.

# PRESENT WELL STATUS FOR LO6-21



PETRO-TECH PERUANA S.A.  
 LO6 <not named>, LO6-21R  
 LOBITOS, Offshore Peru

PROPOSAL LISTING Page 1  
 Your ref : Revision #3  
 Last revised : 4-Mar-96

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S		Dogleg Deg/100Ft	Vert Sect	
5300.00	25.34	172.35	4916.25	1577.97 S	751.76 E	0.00	1636.74	KOP 4.5/100 ft
5400.00	28.88	178.48	5005.27	1623.35 S	755.25 E	4.50	1682.25	
5500.00	32.64	183.33	5091.20	1674.43 S	754.33 E	4.50	1733.07	
5600.00	36.54	187.27	5173.52	1730.91 S	748.99 E	4.50	1788.88	
5633.25	37.87	188.42	5200.00	1750.83 S	746.24 E	4.50	1808.48	Mogollon
5700.00	40.56	190.54	5251.72	1792.44 S	739.27 E	4.50	1849.34	
5800.00	44.65	193.30	5325.31	1858.63 S	725.23 E	4.50	1914.08	
5900.00	48.80	195.69	5393.85	1929.08 S	706.96 E	4.50	1982.70	
6000.00	52.99	197.80	5456.91	2003.36 S	684.57 E	4.50	2054.78	
6074.32	56.13	199.21	5500.00	2060.77 S	665.34 E	4.50	2110.32	San Cristobal
6100.00	57.22	199.68	5514.11	2081.00 S	658.19 E	4.50	2129.87	
6180.34	60.64	201.06	5555.56	2145.49 S	634.23 E	4.50	2192.06	Start Tangent Section
6500.00	60.64	201.06	5712.31	2405.47 S	534.09 E	0.00	2442.47	
7000.00	60.64	201.06	5957.48	2812.11 S	377.47 E	0.00	2834.15	
7351.84	60.64	201.06	6130.00	3098.26 S	267.26 E	0.00	3109.76	LO6-21R/Basal Salina
7500.00	60.64	201.06	6202.65	3218.76 S	220.85 E	0.00	3225.83	
8000.00	60.64	201.06	6447.82	3625.40 S	64.22 E	0.00	3617.51	
8412.32	60.64	201.06	6650.00	3960.74 S	64.94 W	0.00	3940.50	Balcones
8500.00	60.64	201.06	6692.99	4032.05 S	92.40 W	0.00	4009.19	
8718.23	60.64	201.06	6800.00	4209.53 S	160.76 W	0.00	4180.14	T.D.

All data is in feet unless otherwise stated  
 Coordinates are from slot #21 and TVDs are from wellhead.  
 Vertical section is from wellhead on azimuth 175.07 degrees.  
 Calculation uses the minimum curvature method.

LO6-21R  
 Plot Version #3  
 4/3/96

# PETRO-TECH

**PETRO-TECH**  
**PERUANA S.A.**

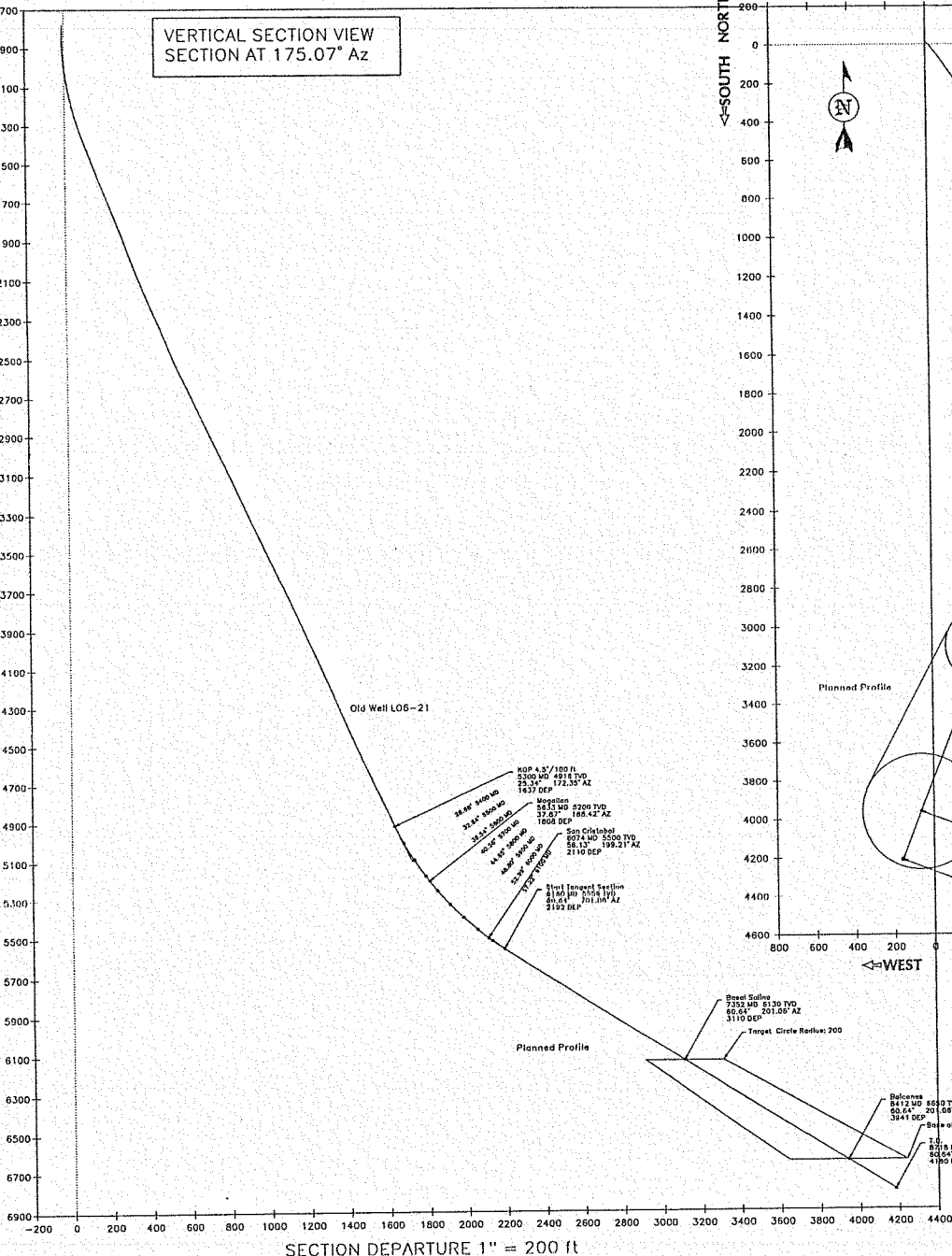
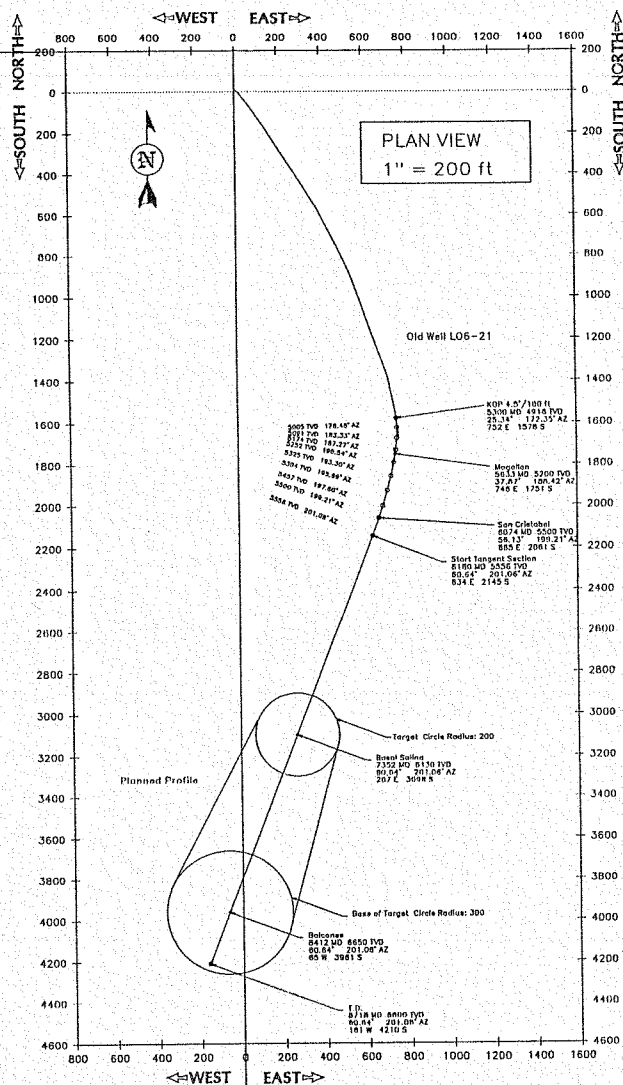


Schlumberger Anadrill

WELL	LO6-21R	FIELD	LOBITOS	RNO	PETREX 114
Magnetic Declination	Angle: 2.1753° FS: 29191.14	Lat: S 4°28'30.72"	Surface: X: 459,303.52 Y: 9'509,020.41	Target: X: 459,384.98 Y: 9'508,076.06	KB Elevation: 50 Ft
Model:	IGRF	Dip: 14.937° Date: 4/3/96	Long: W 81°22'0.56"		Drawn: 04-Mar-96 Plan#: Revision #3

1" TVD = 200 ft

VERTICAL SECTION VIEW  
 SECTION AT 175.07° Az



Drawn by: Juan Rodriguez 05/03  
 Checked by: Lawrence Messer 05/03  
 Client OK:

## **WELL: Z-2B-21-031-D-LO6 (LO6-21R)**

### **DRILLING PROCEDURE**

1. Skid Petrex Rig over well LO6-21R.

2. Nipple Up BOP stack 7 1/16" x 3000 psi

Make up 4 3/4" bit / BS / 02 DC's / 14 HWDP / Jars / Flex Jt. / 05 HWDP / 2 7/8" H-90. RIH and drill cement and float shoe. Clean out rat hole with bit to 5503'. POOH.

3. RIH with underreamer and clean out 8 1/2" rat hole to 5503'. POOH.

4. Make up diverter tool / xo / 2 3/8" tbg (10 joints) / xo / 2 7/8" H-90. RIH at 5503' and set cement plug according to attachment.

5. PU cement bit and clean out to shoe after 16 hours. Wait a full 24 hours until drilling under the shoe. After 24 hours drill below the shoe 25 feet, circulate. POOH.

6. Make up drilling BHA consisting of the following:

3 1/16" x 2 1/16" x 16.8 lb/ft HW (05 ea)

3 3/4" 1 1/2" Jar & Flex joint

3 1/16" x 2 1/16" x 16.8 lb/ft HW (14 ea)

3 7/8" x 2 5/16" Drill Collar (02 ea)

4 3/4" String Stabilizer

3 1/2" x 2 1/4" NMDC

4 3/4" String Stabilizer

3 1/2" x 2 1/4" NMDC

3 1/2" x 2 9/16" UBHO

3 3/8" Motor.

4 3/4" ATJ-S22 Bit.

- NOTE: Use bypass jet in Motor & configure MWD to allow a 150 gpm flow rate.

7. Drill and start kick off by 5300' building angle to 60.64° (6180') with DLS no more than 4.50°/100' to S 21.06° W. in direction.

8. Short trip every 24 hours or 800 feet in the build section of the hole.

9. After direction & angle are achieved. Trip for stabilized rotary assembly. RIH with the following packed BHA:

3 1/16" x 2 1/16" x 16.8 lb/ft HW (05 ea)

3 3/4" x 1 1/2" Jar & Flex Joint

3 1/16" x 2 1/16" x 16.8 lb/ft HW (14 ea)



3 7/8" x 2 5/16" Drill Collar (08 ea)  
3 1/2" x 2 1/4" NMDC  
4 3/4" Straight Stabilizer  
3 1/2" x 2 1/4" NMDC  
3 1/2" x 2 9/16" UBHO  
4 3/4" Straight Stabilizer  
3 7/8" x 2 5/16" Short Drill Collar  
4 3/4" Near Bit  
4 3/4" DS-74HJ PDC Bit.

10. Drill the Basal Salina formation and continue to T.D.(± 8720'), according with the bit program.

11. Increase the mud weight according to program and/or according with well behavior.

Note: The computerized mud logging unit will provide details parameters in real time.

12. Circulate, make a short trip to 5 1/2" casing shoe and POOH for logging.

13. Run electrical logs according to attached program.

14. R.I.H. with drill string to condition hole for running 3 1/2" liner.

15. Calculate the annular volume of the hole and mix a pill of equal volume of mud containing 30 sacks of LUBRA-BEADS. Spot the Lubra-Bead pill in the annulus.

16. POOH. drill pipe string.

Note : Drill pipe which will be used in the liner cementing operation should be accurately measured and isolated. Other drill pipe pulled from the hole should be tied off on the other side of the pipe racking board.

17. Run the 3 1/2" production liner and make completion job as per attached completion program.



## **WELL: Z-2B-21-031-D-LO6 (LO6-21R)**

### **MUD PROGRAM**

1. Prepare 300 Bbl. FLO-PRO drilling mud to displace sea water in cased hole. The initial mud weight: 10.2 #/gal. (in pits).
2. Drill ahead to total depth and increase the mud weight according to program and/or according with well behavior.
3. Is important to keep new mud in the reserve pits to renew the drilling mud and maintain the drilling solids in low levels.

### **MUD PREPARATION AND MAINTENANCE**

Follow the next order for mud preparation:

<u>Material</u>	<u>Concentration</u>
1- Industrial Water	100%
2- Caustic Potash	1-1.5 Lb/Bbl.
3- Flo-Vis	2 Lb/Bbl.
4- Pac-Plus Reg.	1 Lb/Bbl.
5- Pac-Plus UL.	1.5 Lb/Bbl.
6- KLA-GUARD	5 Lb/Bbl.
7- LUBE-100	3 Lb/Bbl.
8- NaCl.	90-100 Lb/Bbl.
9- Wate-Sal A	5 Lb/Bbl.
10 KCL	8 Lb/Bbl.
11 M-I Bar	68 Lb/Bbl

Note: additional materials may be required.

### **VOLUME TO PROCESS:**

Vol. in pits	:	300 Bbl.
Vol. in 5 1/2" Csg.	:	120 Bbl.
Vol. in hole ( $\pm$ 6")	:	120 Bbl.
Vol. for dilution (5%/day)	:	540 Bbl.
Total Vol.	:	1080 Bbl.

**COST AND MATERIALS ESTIMATED:**

Product	Unit	Conc. (Lb/Bbl.)	Qty.	Cost (\$)	Total Cost (\$)
Caustic Potash	50 Lb/Sx	1.5	32	25.34	811
Flovis	25 Lb/Sx	2	86	277.88	23898
Pac Plus R	50 Lb/Sx	1.0	22	130.45	2870
Pac Plus UL	50 Lb/Sx	1.5	32	130.45	4174
KLAGARD	55 Gal/Dr	5.0	11	1035.76	11393
Watesal-A	50 Lb/Sx	5.0	108	18.40	1987
LUBE-100	55 Gal/Dr	3.0	6	488.45	2931
NaCl	80 Lb/Sx	90.0	1215	6.40	7776
KCL	50 Lb/Sx	8.0	173	17.46	3021
M-I Barite	100 Lb/Sx	68	734	6.40	4698
Total Cost				\$	63559
Cost Per Foot				\$/Ft	18.32
Cost Per Bbl.				\$/Bbl.	58.85

**Notes:**

The mud will be recovered at the end of the well and utilized in other drilling projects to reduce costs.

### **OTHER RECOMMENDATIONS:**

- ⇒ Make a short trip when long interval is drilled (800'-1000') in order to keep the hole calibrated and to prevent stuck pipe.
- ⇒ Will be necessary to increase the inhibitor material concentration (EMI-18, KCL, Shale Check) in high ROP drilled intervals and/or highly plastic formations in order to replace consumed inhibitor to avoid shale incorporation in mud.
- ⇒ Is recommended to maintain screens 150-180-200 mesh in stock and replace immediately the used mesh if is defect.
- ⇒ Run centrifuge daily or as needed to control solids.
- ⇒ Add lubra-beads before casing job to reduce drag in the hole

## WELL: Z-2B-21-031-D-LO6 (LO6-21R)

### CEMENT WHIPSTOCK PLUG

1. Make up 2 7/8" H-90 / xo / 2 3/8" tbg (10 joints) / xo / diverter tool. RIH at 5503' and circulate rat hole with mud until returns are clean.
2. RU cement lines and pump through the lines to determine the exact capacity of the lines from the cement unit to the rig floor. It is important to know this volume!
3. Spot a balanced plug consisting of 25 Bbls of cement ( 17 Ppg. 140 sx class "H" Thickening time is 1 hour and 40 minutes. Make sure that pipe is near bottom while cementing. Displace with mud or sea water. Cut displacement short by two Bbls. **DO NOT OVER DISPLACE!**
4. Pull out of the plug **SLOWLY** to prevent coring the plug and to prevent swabbing action. Continue slowly until approx. 200' above the shoe.
5. Reverse out excess cement. Keep pressure to a minimum and circulate only until returns are clean. Two drill pipe volumes should be sufficient.
6. POOH 5 stands slowly and wait 8 hours before continuing to POOH.

**WELL: Z-2B-21-031-D-LO6 (LO6-21R)**

**MUD PROPERTIES**

<b>Interval</b> (Ft)	<b>Wt</b> (Ppg)	<b>Visc.</b> (Seg/qt)	<b>Pv.</b> (Cps)	<b>Y.P.</b> Lb/100Ft <sup>2</sup>	<b>I. Gel</b> Lb/100Ft <sup>2</sup>	<b>Fi/r</b> (Cc/30')	<b>PH</b>	<b>Cl</b> Mg/Lt	<b>K+</b> Mg/Lt
5300-6200	10.2-10.6	50/55	20/22	25/30	8/14	6/5	9.5	15000	12000
6200-7350	10.6-10.8	50/55	20/24	25/30	10/14	5/5	9.5	15000	17000
7350-8720	10.8-11.5	50/55	24/28	25/30	10/14	5/4	9.5	16000	17000

**WELL: Z-2B-21-031-D-LO6 (LO6-21R)**

**BIT PROGRAM**

<b>Depth</b> (Ft)	<b>Size</b> (In.)	<b>Nº Bits</b>	<b>Type</b>	<b>IADC</b>	<b>W.O.B.</b> (1000 Lb)	<b>RPM</b> (*)
5300 - 6200	4 3/4	2	ATJ-S22	5-1-7	5 / 10	PP / 60
6200 - 8720	4 3/4	1	DS74A7HF+J	PDC	8 / 15	100 / 80

## WELL: Z - 2B - 21 - 029 - D - LO6 ( LO6 - 22R )

### HYDRAULIC PROGRAM

DEPTH ( FT )	NOZZLES ( 32 nds in )	TFA ( In2 )	FLOW RATE ( GPM )	PUMP PRESS ( Psi )	BIT PRESS ( Psi )	VELOCITY (FPM)			JET VEL ( FPS )	HSI	IMPACT ( Lbs-F )	ECD ( Lbs/GI )
						H.W	D.P	CRITICAL				
5300 -6300	3 x 12	0.331	150	2040	135	297	274	529	155	0.7	105	12.1
6200 - 7350	5 x 10	0.383	175	2860	144	325	300	542	146	0.8	120	12.7
7350 - 8720	5 x 10	0.383	160	3070	166	297	274	540	134	0.9	121	13.4

USE BYPASS JET IN MOTOR & CONFIGURE MWD FOR 150 GPM FLOWRATE.

MUD PUMPS - PZ7 4 1/2" LINER



## WELL: Z-2B-21-031-D-LO6 (LO6-21R)

### COMPLETION PROGRAM

#### General Description:

- The objective will be to cement and complete Basal Salina formation, running 3 1/2" production liner from 8720 ft. (TD) to 3750'
- Centralizers. Use centralizers one per joint from TD and across Basal Salina Formation, consider one centralizer every 5 joints for the rest of cemented intervals consider also one centralizer per joint thru liner lap.

Floating equipment:

- Lindsey F.S. single valve float shoe.
- Lindsey F.C. Float Collar.
- Lindsey L.C. Landing Collar
- Liner wiper plug

Liner equipment:

- Lindsey Hydraulic Liner Hanger (Model HCSC).
- Lindsey 5 ft. length PBR.
- Lindsey Model SACM setting adapter and 6 ft. Tie back receptacle.
- Model D setting tool.
- Cementing manifold with plug valve and ball drop valve.

#### Procedure for Running and Cementing 3 1/2" Liners:

- 1) Trip to condition hole for running 3 1/2" liner. Before POOH drop hollow drift (rabbit) to check drill pipe ID for pump down plug.
- 2) Make up cementing manifold onto one joint of drill pipe and lay back down. This is for easy access once liner is at desired depth. Leave slings attached so crane can put in the V-door as soon as it is needed to minimize slip time.
- 3) Run +/- 4970 ft of 3 1/2" liner with float shoe, one joint of casing, float collar and landing collar. Use thread locking compound on float equipment. Use sand blasted pipe in the lower 1000 ft of liner. Pump through first few joints to make sure floating equipment is working.
- 4) Fill up every 1000' while RIH and completely at the shoe. After the shoe, continue to use the fill up line between connections to fill up each joint while running. Assign one person to this job and instruct him not to delay the connections. Fill up as much as possible without delaying the operation. **MINIMIZE TIME ON SLIPS.** Keep pipe moving down as much as possible. Hold meeting with rig crew prior to running into open hole and explain and empathize again the importance of keeping the liner moving. Be prepared in advance to fill up. Drill pipe is difficult to fill with a fill up line. It should be run dry. If extra weight is needed fill each joint with water from the water hose between connections. Do not stop to fill up the drill pipe when the liner is in the open hole. Leave at least five single joints of drill pipe in the V-door for quick access in the

event that the kelly must be picked up to wash the casing down. Likewise make sure that the kelly is not trapped in a position where it cannot be accessed. **PLAN IN ADVANCE EVERY STEP OF THE OPEN HOLE INTERVAL!!!** The importance of this step cannot be over emphasized.

- 5) Make up liner hanger and setting assembly, fill dead space between liner setting tool and liner hanger assy with inner gel to prevent foreign material from setting around setting tool.
- 6) Run liner to bottom with drill pipe:
  - Set liner according to attached Lindsey Procedure at 8720'.
  - Cement Slurries:

<u>Mix &amp; Pump (4 BPM)</u>	<u>SLURRY</u>		<u>Water</u>
	<u>Weight</u>	<u>Ft<sup>3</sup>/Sx</u>	<u>Gls/Sx</u>
- Flush 10 Bls. Mud Flush (10 Bls)	8.5	---	---
- Spacer (10 Bls)	12.5	---	---
- Slurry			
160 Sx Net +4% bent +0.5% Halad-9 +0.5 gl/Mgl D-Air2.	13.5	1.72	9.10
190 Sx Net +1.5% Halad 322 +0.12% HR-7 +0.5 gl/Mgl D-Air2	15.6	1.18	5.20
<u>Displacement</u>			
41 bbls. Mud			

- 8) W.O.C. for 24 hrs.
- 9) RIH DP with 4 3/4" bit, drill cement on top of liner, (test with 1000 psi), trip out.
- 10) RIH bit and Mill assy, and tapered string to drill cement inside liner as necessary. POOH
- 11) Run 1 1/4" tubing opened end and displacement the mud by stage with water until bottom after change for diesel. Trip out.
- 12) Run 2 7/8" tubing with sealing assy and sting in over the liner PBR, nipple up tubing head 11" x 5000 psi x 7 1/16" x 5000 psi and test tubing and sealing assy with 2000 psi.
- 13) Run cased hole logging GR-CCL thru 2 7/8" tubing.
- 14) Perforate Basal Salina with 2 1/8" hollow carrier guns according perforating program.

## **WELL: Z-2B-21-031-D-LO6 (LO6-21R)**

### **ELECTRICAL LOGGING PROGRAM**

#### **I- OPEN HOLE LOGS:**

- TO BE DETERMINED

#### **II- CASED HOLE LOGS:**

- GR - N - CCL

## DATA TABLES

GENERAL CASING DATA					
SIZE	WEIGHT LBS/FT	GRADE	CONNECTION	OPTIMUM MAKE UP TORQUE (FT/LBS)	MAXIMUM OVERPULL (TENSION) LBS
18	70.59	ASTM A53B	WELD CONN	N/A	N/A
13 3/8"	54.5	K-55	STC	5470	547,000
9 5/8"	43.5	N-80	LTC	8130	813,000
5 1/2"	17.0	K-55	LTC	2720	272,000
5 1/2"	17.0	N-80	LTC	3410	338,000
5 1/2"	20.0	N-80	LTC	4200	416,000
3 1/2"	9.3	J-55	Atlas Bradford FL4S	1400	78,000

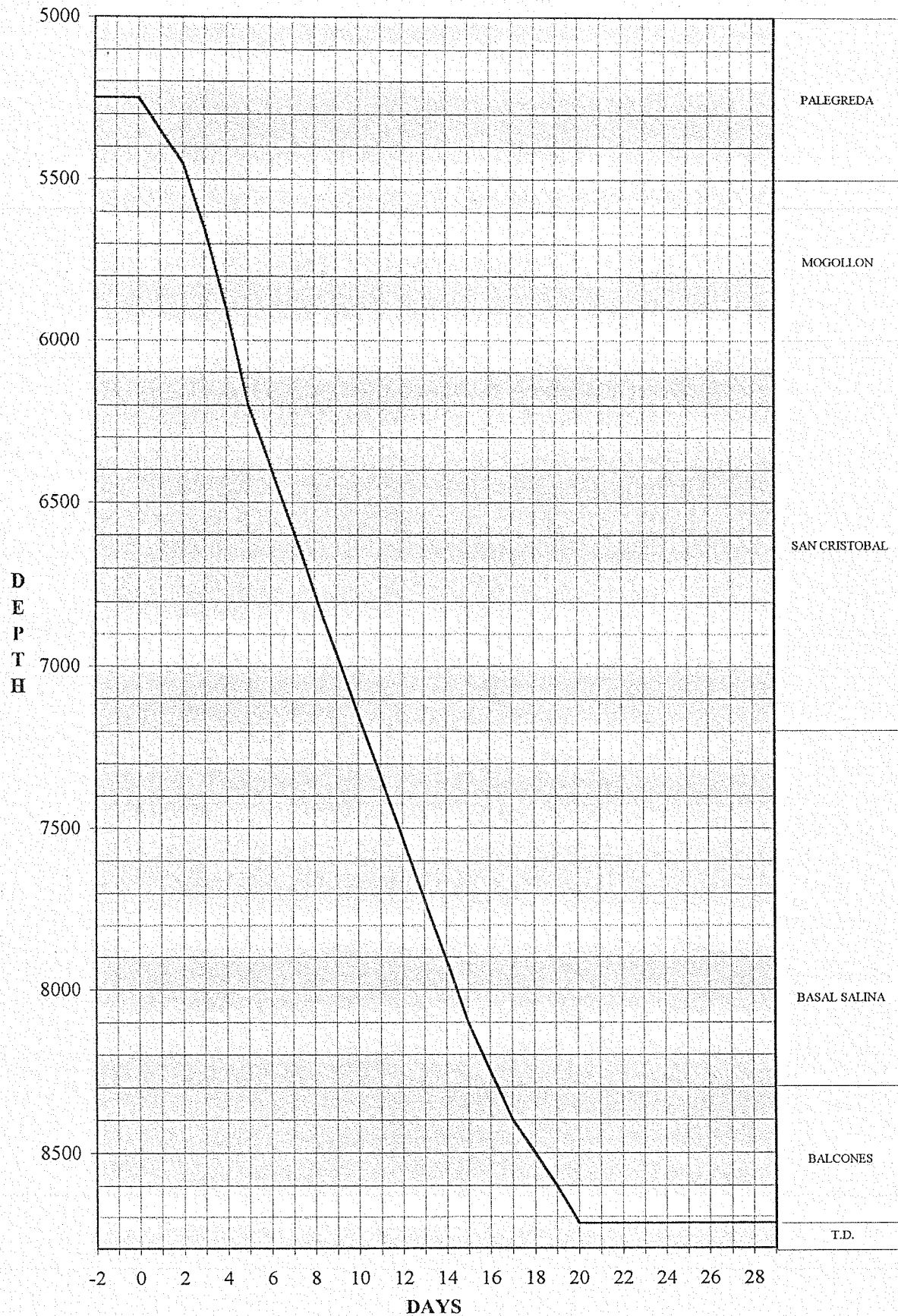
SIZE	GRADE	WT	ID	DRIFT DIA	Burst psi	Collapse psi	BBL/FT	FT/BBL
13 3/8"	K-55	54.5	12.615	12.459	2730	1130	.1545	6.47
9 5/8"	N-80	43.5	8.755	8.599	6330	3810	.0744	13.43
5 1/2"	K-55	17.0	4.892	4.767	5320	4910	.0232	43.01
5 1/2"	N-80	17.0	4.892	4.767	7740	6280	.0232	43.01
5 1/2"	N-80	20.0	4.778	4.653	9190	8830	.0221	45.09
3 1/2"	K-55	9.3	2.992	2.867	6980	7400	.0087	114.99

BUOYANCY FACTORS FOR STEEL PIPE IN VARIOUS WEIGHT FLUIDS									
LBS/GAL	FACTOR	LBS/GAL	FACTOR	LBS/GAL	FACTOR	LBS/GAL	FACTOR	LBS/GAL	FACTOR
9.1	.8609	9.6	.8533	10.1	.8457	10.6	.8380	11.1	.8304
9.2	.8594	9.7	.8518	10.2	.8441	10.7	.8365	11.2	.8289
9.3	.8579	9.8	.8502	10.3	.8426	10.8	.8350	11.3	.8273
9.4	.8564	9.9	.8487	10.4	.8411	10.9	.8334	11.4	.8258
9.5	.8548	10.0	.8472	10.5	.8395	11.0	.8319	11.5	.8243

CONVERSION FACTORS		
Centigrade Degree	$(C^{\circ} \times 1.8) + 32$	= Degrees Fahrenheit
Centimeter (cm)	$\times .393700$	= Inch
Circle Diameter	$\times 3.1416$	= Circumference
Cubic Foot	$\times .1781$	= Barrel (42)
Diameter x Circumference	$\times .25$	= Area
Fahrenheit Degree	$(F^{\circ} - 32) \times .555$	= Degrees Centigrade
Foot-Pound	$\times .138255$	= Kilogram-Meter
Gallon Liquid U.S.	$\times .133680555$	= Cubic Feet
Knot US	$\times 1.15155$	= Mile/Hour
Liter	$\times .035316$	= Cubic Feet
Liter	$\times .264178$	= Gallon US
Pound	$\times .4536$	= Kilograms
Steel (cubic foot)	$\times 489.569$	= Pounds (pipe or tubing)
Cost of any item	-\$1.00	= Amount in your pocket

# LO6-21

## Bar-B-Que Curve



**AUTHORIZATION FOR EXPENDITURE - AFE**  
**TALARA - NEGRITOS**

MANAGEMENT	YEAR 1996	API X	A P G	AFE NUMBER 9622102
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GEN	C. C.	DEPT. NAME DRILLING	BUDGET	NON BUDGET	BUDGET - ITEM
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PROJECT OR BUDGET ITEM DESCRIPTION Z-2B-21-031-D-LO6 (LO6-21R)	CAPITAL OR EXPENSE CAPITAL
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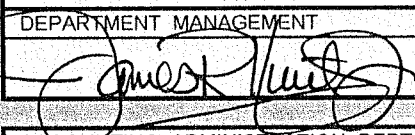
PROJECT OR BUDGET ITEM DESCRIPTION
<p>Following the development of the LO6 Drilling Program this well will test the Basal Salina sands to the southwest of the platform. It is expected to drill approximately 3780 feet of slim hole to reach the objective. The maximum angle in the hole will be 61degrees reaching a TD of 8720' measured depth.</p>

JUSTIFICATION
<p>Further develop the Basal Salina Formation in the Lobitos Area according to the 1996 drilling program.</p>

EXPENDITURES AMOUNTS IN US \$	1st. QUARTER			2nd. QUARTER			3rd. QUARTER			4th. QUARTER			TOTAL US \$
MONTH OF EXPENS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	(000)
OUTSIDE SERVICE			492.7	93.8									586.5
MATERIAL & SUPPLIES			140.8	26.8									167.6
OTHER													
TOTAL DIRECT COSTS	0.00	0.00	633.50	120.60									
ALLOCATIONS													
TOTAL US \$ (000)	0.00	0.00	633.50	120.60									754.1

ONLY FOR BUDGETING	TOTAL US \$ (000)
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AMOUNT APPROVED	
TRANSFER	
I.- NEW AMOUNT APPROVED	
AMOUNT LAST EXPENDITURE	
AMOUNT AFE	
II.- AMOUNT SPENT	
III.- AVAILABLE FUNDS	

APPROVAL	
DEPARTMENT MANAGEMENT	DATE
	5 MAR 96
ACCOUNTING ADMINISTRATION DEPT.	DATE
OPERATIONS MANAGEMENT	DATE
GENERAL MANAGEMENT	DATE



**PETRO-TECH**  
PERUANA S.A.



**PETRO-TECH PERUANA S.A.**

CIA	ACD	BUDGET ITEM
06		

A F E No.
9622102

FU	WELL DESCRIPTION	OFICIAL NUMBER	DD / MM / AA
18	LO6-21R	Z-2B-21-031-D-LO6	03-04-96

**TOTAL ESTIMATED DAYS**

FU	TYPE OF WELL	MOVEMENT	DRILLING	COMPLETATION	EST FOOTAGE	A R E A
19	DEVELOPMENT	3	20	8	2949	LOBITOS

FU	GEN	CC	AREA
20			

**WELL COST BREAKDOWN**

SUB	DESCRIPTION	QUANTITY	UNIT COST	SUB-TOTAL	TOTAL US\$
<b>OUTSIDE SERVICES:</b>					
500	RIG MOVEMENT SERVICE	3.0	5246		15,800
501	DRILLING RIG SERVICE	20 / 8	9100 / 8270		248,200
502	MUD ENGINEERING SERVICES	23	300		6,900
503	LOGGING SERVICES				50,000
504	GEOLOGIC CONTROL / MUD LOGGING	20 / 20	500 / 1000		30,000
505	CEMENTING SERV. (13 3/8" O.D. CASING)				
506	CEMENTING SERV. (9 5/8" O.D. CASING)				
507	CEMENTING SERV. (3 1/2" O.D. LINER)				10,400
508	OTHER CEMENTING SERVICES / SQUEEZE				18,000
509	PERFORATING				45,000
510	FRAC SERVICE				
511	DIRECTIONAL DRILLING SERVICES	4 / 16	11400 / 4200		112,800
512	TOOLS SERVICES				13,600
513	HYDRAULIC TONGS SERVICES				
514	MATERIALS TRANSPORT SERVICES				11,000
515	TUBULAR INSPECTION SERVICES				
516	OTHERS DRILLING SERVICES	31	800		24,800
	<b>TOTAL OUTSIDE SERVICES:</b>				586,500
<b>MATERIALS &amp; SUPPLIES:</b>					
530	BITS				34,000
531	DIESEL FRACTURING				
532	MUD & CHEMICALS				64,000
533	FRAC MATERIALS				
534	OTHERS DRILLING MATERIALS				
535	CEMENTING MATERIALS (13 3/8" O.D. CASING)				
536	CEMENTING MATERIALS (9 5/8" O.D. CASING)				
537	CEMENTING MATERIALS (3 1/2" O.D. LINER)				9,000
538	OTHERS CEMENTING MATERIALS				6,000
539	CONDUCTORS				
540	SURFACE CASING : 13 3/8" O.D.				
541	INTERMEDIATE CASING : 9 5/8" O.D.				
542	PRODUCTION CASING : 3 1/2" O.D. LINER	4970	4.9		24,400
543	WELL HEADS				5,000
544	PRODUCTION TUBING : 2 7/8" O.D.	3750	2.7		10,200
545	OTHER SURFACE EQUIPMENT				
546	SUB-SURFACE EQUIPMENT				15,000
547	MISCELLANEOUS CONNECTIONS				
	<b>TOTAL MATERIALS &amp; SUPPLIES:</b>				167,600
<b>ALLOCATIONS:</b>					
601	BARGES OPERATIONS				
602	DRILLING EXPENDITURES				
603	FLOATING DOCKS				
606	DIVERS				
607	BOATS :				
	CREW BOATS				
	SUPPLY BOATS				
	TUG BOATS				
	FRAC BOATS				
	<b>TOTAL ALLOCATIONS:</b>				

**TOTAL PROJECT COST US \$**

**754,100**

APPROVAL BY :

*[Signature]*

DATE :

**5 MAR'96**