



To: John Meyers

From: Marco A. Raez

Date: September 14, 1998

Ref: Upper Bs. Salina WO's. Platform LO16

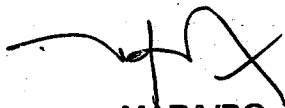
John,

As per your recommendation, we reviewed the Upper Bs. Salina around platform LO16. Wells LO16-8 and LO16-7, are in the top of the structure. The LO16-22, cummulated 724MBO, with present production of 34 BOPD and 4200 GOR. Drainage area is 35 Acres. Well LO16-8 is 336ft. higher structurally and 18 Acres from LO16-22, Therefore might be depleted.

Well LO16-7 is 322ft. higher structurally than the LO16-20 and 18 Acres from that well. The LO16-20 cummulated 43 MBO, actual production is 22BOPD and 7800 GOR. The LO16-7 might be also depleted.

Gas is being injected by the Lw. Bs. Salina in well LO16-21, where the Upp. Bs. Salina is isolated after an accumulated production of 13 MBO. Our expectations are in the Lower Basal Salina in wells LO16-7, 8, and 16, as it is being noticed in wells LO13-16 and LO16-13.

Regards,



MAR/VPG

Post-it [®] Transmisión por Fax 7671		FECHA/ DATE	Nº DE PAGINAS/ # OF PAGES
PARA/TO J. MEYERS	DE/FROM M. RAEZ		
COMPANIA/CO.	COMPANIA/CO.		
DEPARTAMENTO/DEPT.	TELEFONO/PHONE #		
FAX	FAX		

LO16-LO13 RESERVOIR BLOCK

	WELL LO13-20	WELL LO13-16 (no logs) (litho top)	WELL LO16-13 (no logs)	WELL LO16-16	WELL LO16-21	WELL LO16-9	WELL LO16-7 (faulted top)	WELL LO16-8	WELL LO16-22
UPPER BASAL SALINA									
TOP (MD)	7470	8490	7932	6708	6998	7202	7115	7154	7292
(SS)	6895	6612	6974	6658	6714	6914	6602	6481	6798
BASE (MD)	7536	8670	7970	6922	7176	7302	7162	7392	7550
(SS)	6954	6742	7005	6872	6875	7013	6643	6692	7038
GROSS THICKNESS	66	180	38	214	178	100	47	238	258
TOTAL NET SAND	36	82	17	116	36	58	31	76	120
RATIO NET/GROSS	55			54	20	58	66	32	47
TOTAL NET OIL SAND	26	54	11	57	30	25	22	44	71
TOTAL VERTICAL NET OIL SAND	24	38	9	57	29	25	19	39	67
RATIO NET OIL/NET SAND	72			49	83	43	71	58	59
AVERAGE POROSITY	9.47			8.15	9.45	10.22	10.03	8.82	9.64
AVERAGE WATER SATURATION	25.31			25.48	30.49	45.03	41.84	30.87	39.96
AREA DRAINAGE	18	180	130	131		50	60	60	133
VOLUMETRIC RESERVES	47	657	112	702	0	110	103	221	800
E.U.R.				702		110			800

LOWER BASAL SALINA

	(BNR)	(BNR)	(BNR)			(faulted top)			(NR)
TOP (MD)	7830	8870	8360	7095	7280	7740	7524	7838	
(SS)	7227	6885	7320	7045	6950	7449	6962	7096	
BASE (MD)	8319	9407	8682	7450	7527	7768	7930	8085	
(SS)	7674	7261	7576	7391	7219	7476	7319	7320	
GROSS THICKNESS	489	537	322	355	247	28	406	247	
TOTAL NET SAND	297	260	156	138	141	19	253	176	
RATIO NET/GROSS	61			39	57		62	71	
TOTAL NET OIL SAND	143	84	51	18	80	6	91	72	
TOTAL VERTICAL NET OIL SAND	130	59	43	18	76	6	82	66	
RATIO NET OIL/NET SAND	48			13	57		36	41	
AVERAGE POROSITY	11.55			11.38	9.46	9.78	10.07	10.86	
AVERAGE WATER SATURATION	35.59			31.44	37.59	35.28	37.59	37.33	
AREA DRAINAGE	17	198	130	60	85		59	49	
VOLUMETRIC RESERVES	216	955	457	111	500		400	290	
E.U.R.	255	1614	577		500		400	290	

PETRO-TECH



PERUANA S.A.

EPP/BPR-035-95

TO: General Manager

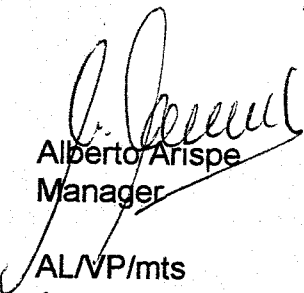
FROM: Exploration-Production Planning Manager

SUBJECT: **WORKOVER PROPOSAL FOR LO16-21, LO16-11,
AND LO16-7 WELLS - MOGOLLON FORMATION**

DATE: March 17, 1995

Attached you will find our proposal to open Mogollon Formation in LO16-21, LO16-11, and LO16-7 Wells. This recommendation is based on good results of these sands previously proven in LO16-9, LO16-17 and LO16-19 Wells, recent workovers made in LO16-13 and LO16-16 Wells, and the geological and reservoir evaluation of Mogollon Formation around LO16 Platform.

It is expected an average final recovery of 180 MBO and 400 BOPD as initial production during the first month for each well.


Alberto Arispe
Manager

AL/VP/mts
Att.

cc: Assistant General Manager
Operations Manager
Assistant Operations Manager - Engineering
Well Files
200.2.5

GEOLOGICAL AND RESERVOIR EVALUATION OF MOGOLLON FORMATION AROUND LO16 PLATFORM FOR WORKOVER PROPOSAL IN LO16-21, LO16-11 AND LO16-7 WELLS

The main objective of LO16 Platform was the development of Basal Salina Formation. The Mogollon Sands --secondary target-- were found showing good potential oil reserves. Geological, petrophysical and reserves evaluations have been carried out to analyze these sands.

CONCLUSIONS

- The LO16 Wells have found good development of Mogollon Formation (see Attachment 1).
- The Mogollon of LO16 Wells is located in a structural megablock where the depth of top is reached between 4500' SS and 5500' SS (see Attachment 2).
- According to the oil net sand map of Mogollon, there is a trend NE-SW toward east of LO16-16 vertical Well, and another next to LO16-17 Well (see Attachment 3).
- Estimation of Ultimate Recovery Reserves per well has been made based on Volumetric Method. This estimation shows 3,100 MBIs of oil for the structural megablock. It is expected to recover 833 MBIs (EUR) of oil from wells currently producing. The remaining reserves are good potential to develop.
- It is estimated 180 MBO of primary reserves and an IPR of 400 BOPD for Mogollon Formation (see Attachment 6).

RECOMMENDATIONS

It is recommended to perform the following workovers:

Well	Interval	Net Sand Thickness		Average Porosity (%)	Average Water Saturation (%)
		MD	VD		
LO16-21 ⁽¹⁾	5650 - 4890	79	75	9.04	30.34
LO16-11 ⁽²⁾	5940 - 4970	68	63	9.57	45.93
LO16-7 ⁽³⁾	5900 - 5450	57	52	12.70	40.21

(1) LO16-21, is 22 acres distant from LO16-16

(2) LO16-11, is 18 acres from LO16-17 and LO16-9 respectively

(3) LO16-7, is 12 acres from LO16-21 and 58 acres from LO16-16

GEOLOGICAL AND RESERVOIR ASPECTS

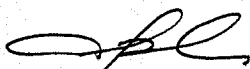
Mogollon Formation

Around LO16 Platform, the vertical gross thickness of Mogollon is from 500' to 1000'. The average porosity is 9.37%, and vertical oil net sand varies from 18 to 130 Ft. (see Attachments 1 and 4).

Structurally, the Mogollon top was found between 4280' to 5532' of depth. All the wells are located in the same block. The structural block of LO13-21 Well is located southward (see Attachment 2).

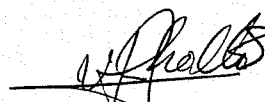
With respect to reserves and production estimates, the Volumetric Method has been used. From log analyses, it is considered an average of 63' of vertical oil net sand, with an average porosity of 9.37%, an average water saturation of 38.5%, and 50 acres as drainage area. Then, oil reserves calculated by well can be of 170 MSTB.

On the other hand, this volume of reserves is very similar to the calculations carried out starting from the decline curves of the Mogollon Formation around the LO16 Platform. It is estimated 180 MBIs of primary reserves with an average IPR of 400 BOPD for the first month. These oil reserves by well should be considered for the economical analysis of the proposed workovers.



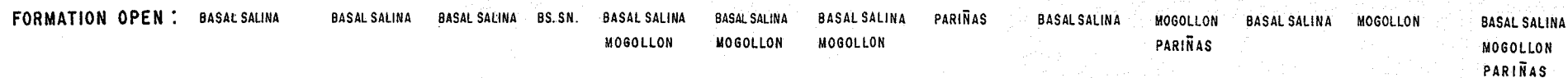
Adán López

AL/VP/mts
March 1995



Víctor Peralta

L016-7 L016-8 L016-22 L016-21 L016-16 L016-9 L016-17 L016-10 L016-11 L016-18 L016-12 L016-19 L016-13



458
UTM

TESTED 180 BO x GI
S.I. TO OPEN PARINÁS

9507
UTM

5000'

128

217

228

L016

L010

22

216

L013

PETRO-TECH PERUANA S.A.
LOBITOS AREA

STRUCTURE ON TOP OF
MOGOLLON FORMATION

SCALE : 1 / 20,000

H. CORNEJO

FEB. 95

ATTACHMENT Nº 2

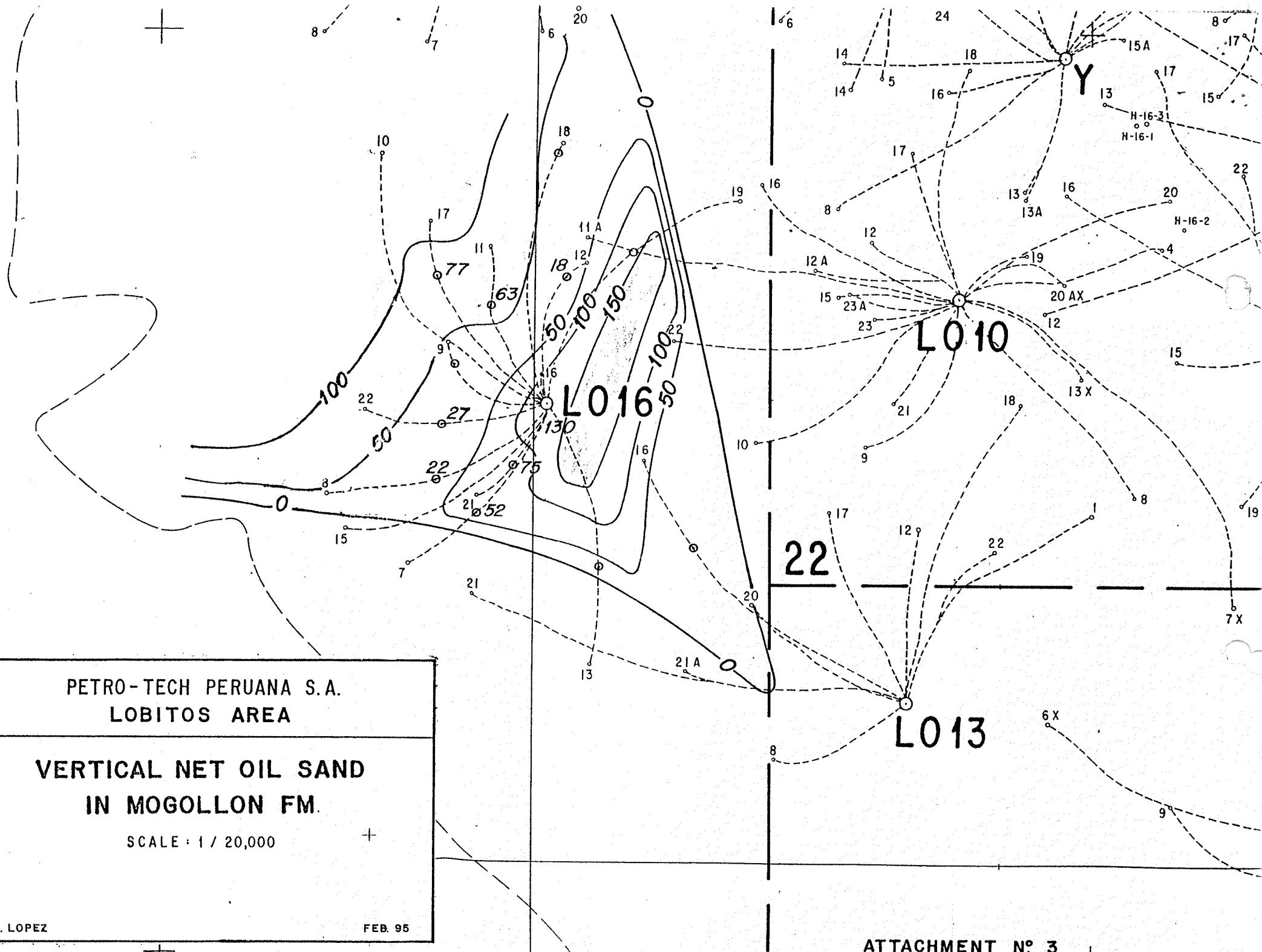
PETRO-TECH PERUANA S.A.
LOBITOS AREA

VERTICAL NET OIL SAND
IN MOGOLLON FM.

SCALE: 1 / 20,000

A. LOPEZ

FEB. 95



PETRO-TECH PERUANA S.A.
EXPLORATION-PRODUCTION PLANNING MANAGEMENT

LOG ANALYSIS - WELLS LO16 PLATFORM - MOGOLLON FORMATION

Well	Interval (Ft.)	Mid. GR Sands Thickness		Net Oil Sands Thickness		Average Porosity (%)	Average Water Saturation (%)
		M.D.	V.D.	M.D.	V.D.		
LO16-7	5521 - 5900	95	87	57	52	12.70	40.21
LO16-8	5721 - 6000	60	51	26	22	7.41	37.83
LO16-11	5201 - 6600	170	157	68	63	9.57	45.93
LO16-12	5171 - 5800	128	120	19	18	8.61	40.82
LO16-16	4431 - 5461	326	326	130	130	9.46	39.63
LO16-17	5451 - 6200	154	140	84	77	8.62	36.66
LO16-21	5251 - 6530	81	76	79	75	9.04	30.34
LO16-22	5401 - 5900	88	81	29	27	7.19	39.03
Average						9.37	38.50

Cut off:

Por. >= 5%
Sw. <= 55%
Vsh. <= 50%

Parameters:

m = 2 n = 1.71 a = 1
Rw = 0.28 a 78°F

VPG/mts

March 1995

ATTACHMENT Nº 4

PETRO-TECH PERUANA S.A.
EXPLORATION-PRODUCTION PLANNING MANAGEMENT

PRODUCTION OF MOGOLLON FORMATION - LO16 PLATFORM

Well	Formation	Perforated Interval (Ft.)	Completion Date	IPR BOPD		Cumulative Production Dec. 1994 (bls.)	EUR (M BLS.)	Remarks
LO16-9	Mogollon	5600 - 5094	Jul. 18, 1994	115		16,651	128	Before opening Mogollon Sands, the Basal Salina was isolated, showing a very poor oil production
LO16-16	Mogollon	5373 - 4443	Feb. 19, 1995	400	(*)	NR	200	(*) Up to the date this Mogollon is producing 450 BOPD on casing flow
LO16-17	Mogollon	6159 - 5831	Jun. 17, 1992	179		74,101	217	Before opening Mogollon Sands, the Basal Salina was isolated, showing a very poor oil production
LO16-18	Mogollon	6619 - 6294	Jul. 30, 1992	NR		0	0	This Mogollon was abandoned on Aug. 18, 1992 due to its very poor production
LO16-19	Mogollon	5946 - 5525	Jun 2, 1992	524		133,895	228	Current production: 49 BOPD
LO16-13	Mogollon	7008 - 6516	Feb. 16, 1995	100	(*)	NR	60	(*) Mogollon and Parifas were opened. Up to the date the well is producing commingly (240 BOPD)

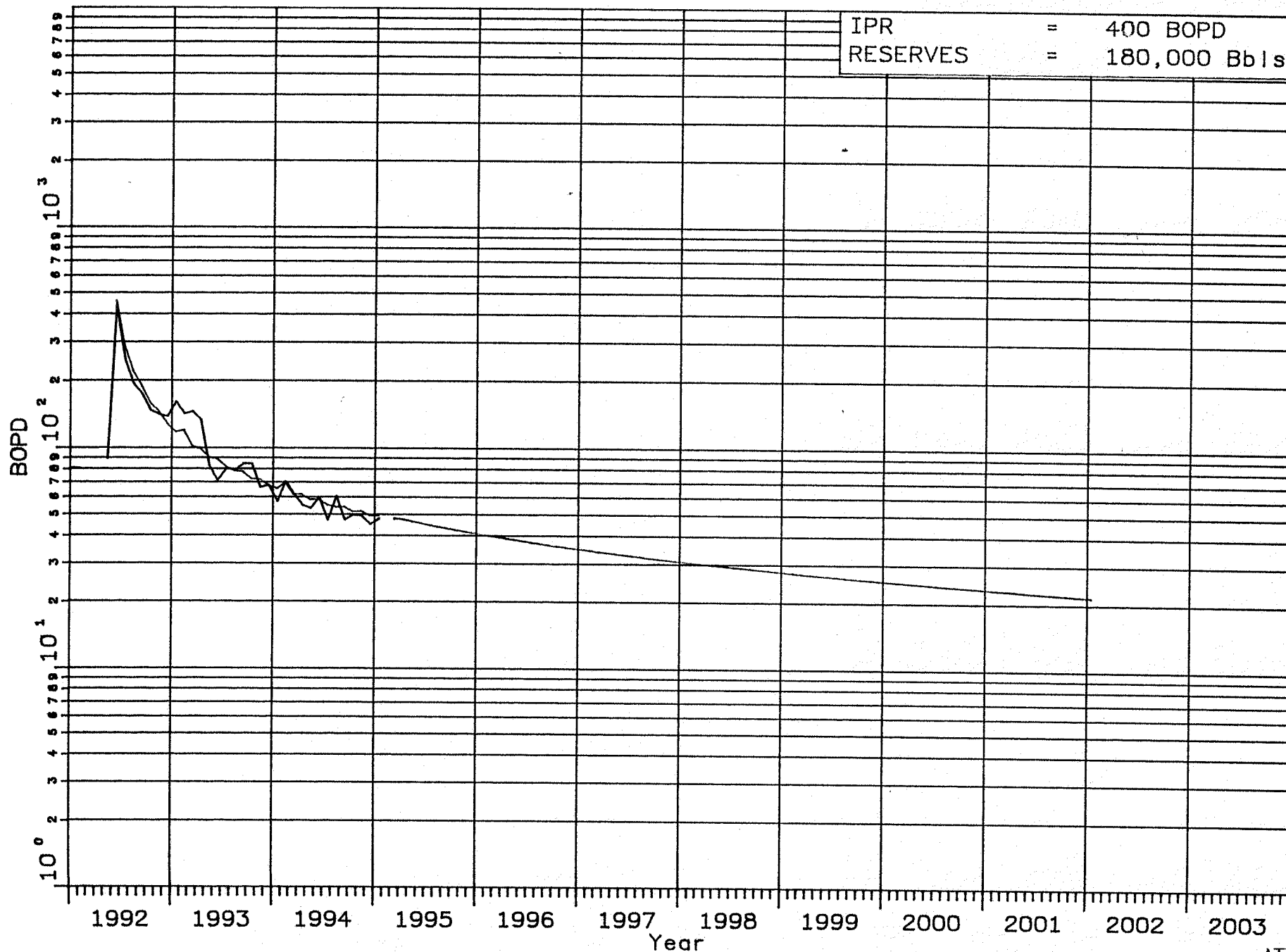
(*) IPR and EUR were estimated

VPG/mts

March 1995

ATTACHMENT N° 5

MOGOLLON FORMATION L016-19 AND L016-17 WELLS



PETROTECH

PERUANA S.A.



PETROTECH
Gerencia de Exploración-Producción

24 JUN 1994

Firma

RECIBIDO

PTP-IDPE-430-94

PTP-IDPR-216-94

Junio 21, 1994

A : Sub-Gerencia de Producción
DE : Sub-Gerencia de Ingeniería
ASUNTO : PROGRAMA DE REACONDICIONAMIENTO. POZO "LO16-21"
LOBITOS MAR

Adjunto sírvase encontrar el Programa y su respectivo API por US \$ 27,729 para aislar temporalmente la sección inferior de la formación Basal Salina con la finalidad de balear la sección superior de la misma formación del pozo en referencia.

Este pozo fue completado en la sección inferior de la formación Basal Salina en Enero.90 y tuvo un IPR de 690 BOPD. Actualmente produce 90 BOPD y ha acumulado 311,142 BLS de crudo hasta MAY.94; pero posee una sección de la formación Salina, que no ha sido abierta, la cual muestra aceptables características eléctricas y litológicas, mejores a la abierta en LO16-9 quien tuvo una producción inicial de 215 BOPD.

Por consiguiente, se recomienda aislar con un tapón RBP la sección inferior de la formación Basal Salina, balear la sección superior de la misma formación (intervalo: 7068'-7042'), usando escopeta de 4" con 4 tiros x pie, con la finalidad de evaluar el comportamiento productivo. Reservorios ha estimado una producción inicial de 150 BOPD en el primer mes.

Un análisis económico del trabajo propuesto nos indica los siguientes resultados:

Reservas	(Mbls)	: 80
Inversión	(M \$)	: 27.73
Precio del Crudo	(\$/Bbl)	: 11.91
Valor presente al 20%	(M \$)	: 457.2
Tasa de retorno	(%)	: > 100
Pay Out	(Meses)	: 1.1
G/I Descontado	(\$/\$)	: 16.5

Ing. Rigoberto Francia G.
Sub-Gerente

RCR/rvds

c.c.: GPEP/PERF/

/Crono./File

POZO: Z2A-21-781-D-L016 (L016-21)

PROGRAMA DE SERVICIO

- 1- Mover una unidad de servicio al pozo "L016-21".
- 2- Desfogar el pozo y controlarlo con crudo, si es necesario.
- 3- Remover el árbol e instalar controles.
- 4- Descargar el packer y sacar la sarta de tubería de 2 7/8".
- 5- Bajar tubería con rima hasta 7500 PM. Sacar.
- NOTA: De ser necesario usar bela.
- 6- Bajar tubería con un tapón RBP de 5 1/2" y sentarlo a 7150 PM.
- 7- Sacar un tubo, llenar el pozo con +/- 7000 gls. (170 Bbls.) de crudo, presurizar con 5000 psi, para probar el tapón. Desfogar.
- 8- Sacar la tubería de 2 7/8" con el pescante.
- 9- Sacar controles e instalar válvula de baleo y presurizar con 5000 psi usando crudo. Desfogar.
- 10 Bajar tubería con niple de asiento hasta +/- 3000 PM y suabear, dejando el nivel de fluido a esa profundidad. Sacar.
- 11 Instalar lubricador y probarlo con 2500 psi. Desfogar.
- 12 Balear de acuerdo al programa del Anexo # 2.
- 13 Si el pozo registra presión, tomar una presión inicial de 3 horas con elemento de 3000 psi. Continuar con el paso # 21.
- 14 De no registrar presión, remover la válvula de baleo e instalar controles.
- 15 Bajar tubería con el pescante de RBP, recuperar y sacar.
- 16 Bajar una instalación gas lift de acuerdo al Anexo # 3.
- 17 Remover controles e instalar árbol.
- 18 Suabear hasta 6700 PM (*)
- 19 Arrancar el pozo usando gas de alta presión.
- 20 Tomar record de presión, evaluar y remitir resultados. Ir al paso # 23.
- 21 Abrir el pozo y choquearlo inicialmente con beam de 1/4", evaluar.
El beam será cambiado en coordinación con la Sub-Gerencia de Ingeniería.
Ir al Paso # 23.
- 22 Si luego de varios días deja de producir, ir al paso # 14.
- 23 Mover la unidad a otra locación.

(*) Si el pozo se viene surgente ir al paso # 21.

RCR/rvds

POZO: Z2A-21-781-D-1016 (1016-21)PROGRAMA DE BALEO

Formación : Basal Salina Superior
Intervalo : 7068'-7042'
(24 PM; 23 PV)
Escopeta : 4" con 4 tiros x pie

<u>INTERVALO</u> (pies)	<u>TIROS x PIE</u> (#)	<u>TOTAL</u>
7068 - 7060	4	32
7054 - 7042	4	<u>48</u>
		80

RCR/rvds

PEINTE-1351 PERUANA S.A.
Gerencia de Ingeniería

SARTA DE PRODUCCION

POZO :

Z2A-21-781-D-L016
NUMERO OFICIAL

L016-21
NUMERO PETROTECH

Lobitos Mar
AREA

AFE Nº

GAS LIFT CONVENCIONAL

TIPO DE INSTALACION

DATOS DEL POZO

PUNTO CERO	FORRO DE PRODUCCION	CABEZAL
27' CHF	5 1/2" x N-80 x 17 Lb/ft	13 3/8" x 9 5/8" x 5 1/2"
I. F. V.	TOPE DE ARENA	ANGULO PROMEDIO
7600'		18°
PERFORACIONES	INTERVALO	FORMACION
	7466'-7293'	Basal Salina Inferior
	7068'-7042'	Basal Salina Superior

INSTALACION PRESENTE

ULTIMO SERVICIO

ULTIMAS PRUEBAS	FECHA	B O P D	B W P D	G O R	ESTADO
	Junio.94	93			TF

OTROS

PROCEDIMIENTO DE TRABAJO

EQUIPO A SER BAJADO

7100 PIES DE TUBERIA 2 7/8" CON NIPLE DE ASIENTO
A 7040 PIES, PACKER R-4 A 7010 PIES, Y MANDRILS CON VALVULAS COMO SIGUE

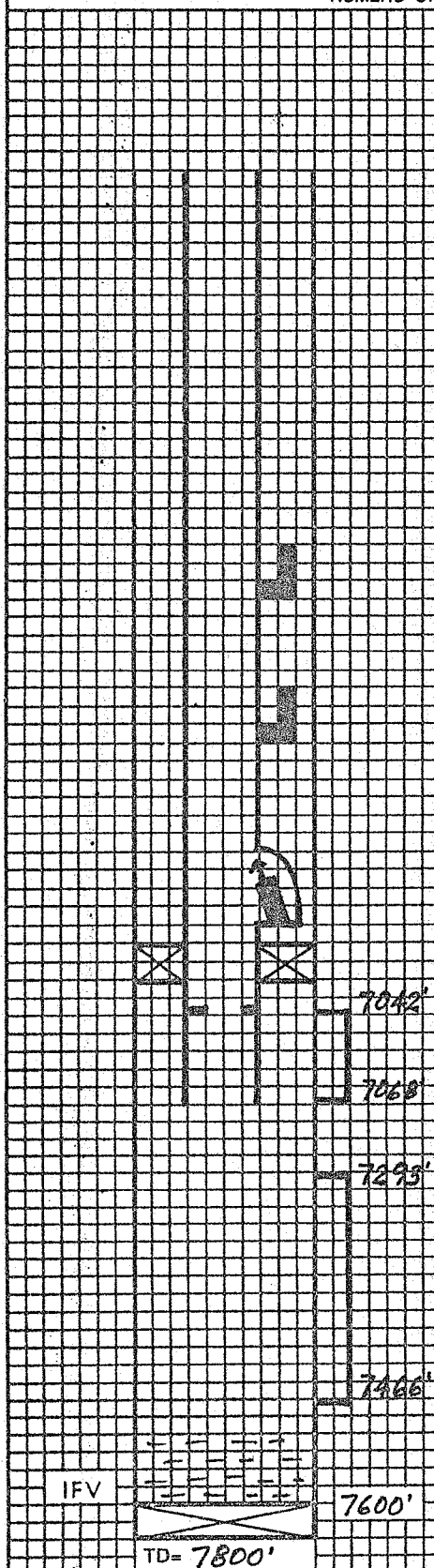
MANDRIL	VALVULA	ORIFICIO	PROF. MED.	PROF. VERT.	TROP
1. KBMG-2	BK-1	5/16"	6980'	6748'	630#
2. B	J-40	5/16"	6035'	5850'	730#
3. B	J-40	5/16"	4880'	4750'	770#
4.					

OBSERV.

- Si el pozo produce surgente, conectarlo al separador de prueba.
- No bajar standing valve.

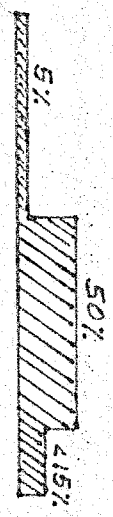
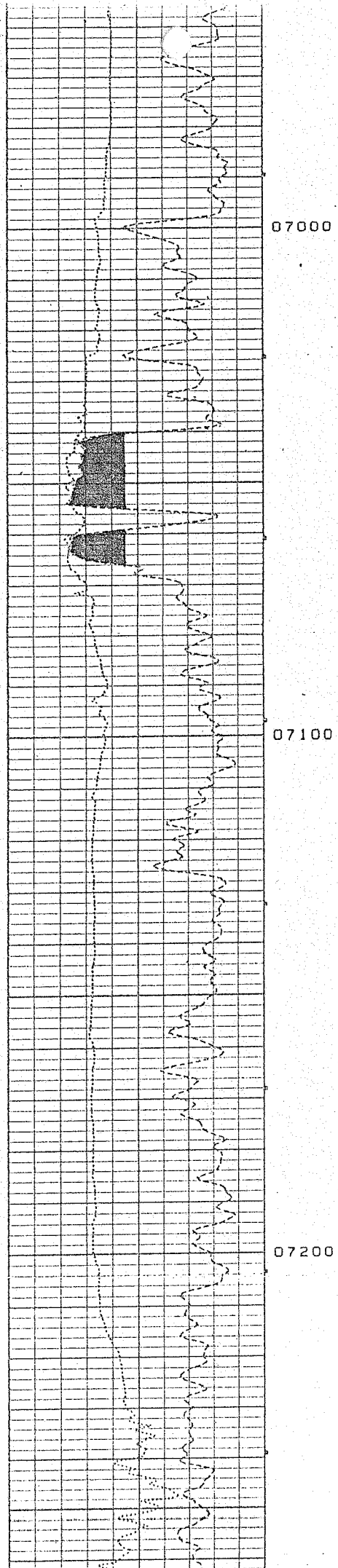
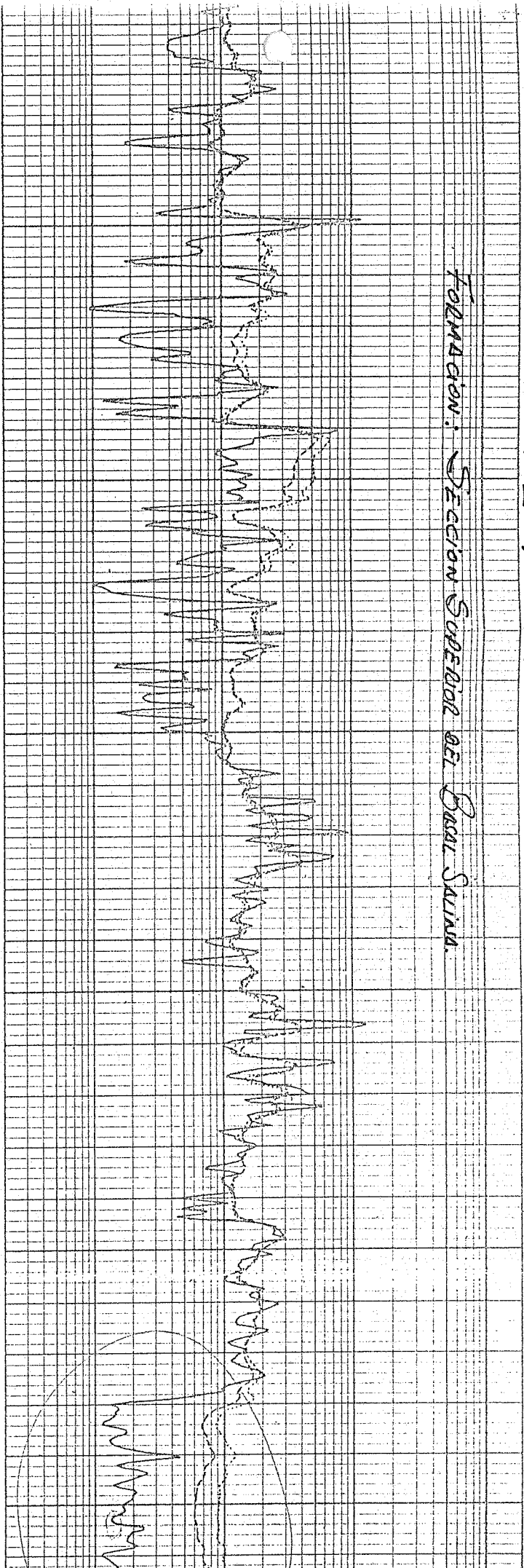
ESQUEMA DE LA INSTALACION

RCR/rvds



Pozo: 1016-21

Formación: SECCION SUPERIOR DEL GRAN SALINA.



EVALUACION ECONOMICA

PROYECTO : REACONDICIONAMIENTO DE LA FORMACION BASAL SALINA
POZO : LO16-21
CAMPO : LOBITOS MAR

ANO	PRODUC. PETROLEO (BOPD)	INGRESOS (M\$)	COSTOS OPERACION (M\$)	DEPRECIA CION (M\$)	AMORTIZA CION (M\$)	MONTO IMPONIB. (M\$)	INVERSION		IMPUESTOS (M\$)	FLUJO DE CAJA (M\$)	
							TANGIBLE (M\$)	INTANG (M\$)		CORRIENTE (M\$)	DESCONT. (M\$)
0							0	28		-28	-28
1	100	435	0	0	28	407	0	0	122	313	233
2	60	261	0	0	0	261	0	0	78	183	360
3	40	174	0	0	0	174	0	0	52	122	430
4	15	65	0	0	0	65	0	0	20	46	452
5	4	18	0	0	0	18	0	0	5	13	457
TOTAL	80008	953	0	0	28	925	0	28	278	648	

PARAMETROS BASICOS

RESERVAS (M Barriles)	80.01
INVERSION :	
- TANGIBLE (M\$)	0.00
- INTANGIBLE (M\$)	27.73
PRECIO DEL CRUDO (\$/bbl)	11.91
TASA DE IMPUESTO (%)	0.30
COSTO DE OPERACION AN	0.00
TASA DE INTERES (%)	0.20
PRECIO DEL GAS (\$/MPC)	0.0

RESULTADOS

VAN AL 20% (M\$)	457.2
TIR (%)	1086.2
PAY OUT (MESES)	1.1
G/I DESCONTADO (\$/\$)	16.5

PETROTECH

NEGRITOS - AUTHORIZATION FOR EXPENDITURE - AFE

PERUANA S.A.

YEAR

AFE

DEPARTMENT

1994

BUDGET

x

90403

C.C. DEPT. NAME

NON

BUDGET

60 PRODUCTION ENGINEERING

PROJECT OR BUDGET ITEM NAME

BUDGET

CAPITAL

ITEM No.

OR EXPENSE

WORKOVER IN WELL L016-21 (UPPER SECTION OF BASAL SALINA FORMATION)

PROJECT OR BUDGET ITEM DESCRIPTION

- 1- POH Tubing and packer
- 2- Isolate lower section of Basal Salina formation with a RBP at 7150 MD.
- 3- Perforate Interval 7068'-7042' (Upper Section of Basal Salina) with 80 shoots (4" OD GUN).
- 4- If the well can't flow itself, fish RBP and RIH conventional GL installation.

JUSTIFICATION

Evaluate the production performance of the Upper Section of Basal Salina formation which is similar to well L016-9. The project is attractive since that the pay out investment will be in 1.1 month.

EXPENDITURES - \$ AMOUNT AND QUARTER TO BE SPENT

	1st. QUARTER	2nd. QUARTER	3rd. QUARTER	4th. QUARTER	TOTAL US \$
OUTSIDE SERVICE		15,000			15,000
MATERIALS & SUPPLIES		2,000			2,000
OTHER					
TOTAL DIRECT COSTS		17,000			17,000
ALLOCATIONS		10,729			10,729
TOTAL US \$		27,729			27,729

ONLY FOR BUDGETING

TOTAL US \$

AMOUNT APPROVED

TRANSFERENC

I.- NEW AMOUNT APPROVED

AMOUNT LASTER

AMOUNT AFE

II.- AMOUNT SPENT

III.- AVAILABLE FUNDS

APPROVAL

AREA MANAGER

DATE

R. FRANCIA G.

22 06 94

ACCOUNTING ADMINISTRATION

DATE

C. BENAVIDES

OPERATIONS MANAGER

DATE

C. VALDIZAN M.

GENERAL MANAGER

DATE

NOTE: APPROVAL OF THIS FORM AUTHORIZES THE ORIGINATOR TO INITIATE THE APPROPRIATE

CIA			ACD			BUDGET ITEM			PETRO-TECH PERUANA S.A.			PROJECT PROPOSAL COST			90403		
1			2			3			4			5			6		
FU			PROJECT NAME									MM / DD / AA					
16			WORKOVER IN WELL L016-21 (UPPER SECTION OF BASAL SALINA FORMATION)												06 21 94		
1			2			3			4			5			6		
FU			PROJECT DESCRIPTION			TOTAL ESTIMATED DAYS			AREA								
19			Isolate lower section of Basal Salina fm. with a RBP and perforate Upper Section of Bs. Ss. Fm.						2.5			Lobitos Offshore					
☒ PRODUCTION FACILITIES (*) ☐ SECONDARY RECOVERY ☐ EQUIPMENT & TOOLS			☐ LAND & PROPERTY ☐ VEHICLES ☐ GENERAL & ADM. NEGRITOS														
☐ MAJOR EQ. REPAIR (EXPENSE) ☐ PRODUC. PROJECT (EXPENSE)																	
1			2			3			4			5			6		
FU			CC			GEN											
20			91			960											
1			2			3			4			5			6		
SUB			DESCRIPTION			QUANTITY			UNIT COST			SUB-TOTAL			TOTAL US \$.		
OUTSIDE SERVICES:																	
			Set RBP			1			3500			3500.					
			Perforating and initial pressure			1			11500			11500.					
TOTAL OUTSIDE SERVICES:																	
MATERIALS & SUPPLIES:																	
			Oil			200 B1			10.00			2000.					
TOTAL MATERIALS & SUPPLIES:																	
2000.																	
OTHERS:																	
167			OTHERS TAX														
TOTAL OTHERS:																	
ALLOCATIONS:																	
						(Days)			(US \$/day)								
			BOATS: CREW 15 hrs.			0.625			922			576					
			: SUPPLY														
			: TUG														
			: FRACC														
331			BOATS TOTAL									576.					
337			WORKOVER RIG (PETREX -117)			2.5			4061			10153					
340			CRANES														
			BARGES														
			DIVERS														
341			BARGES & DIVERS TOTAL									10729.					
TOTAL ALLOCATIONS:																	
27729.																	