INTEROFFICE MEMORANDUM
DEVM- 078-2013

To: Pedro Alarcon / Jae Hwii Gwag / Jin Seok Yi

From: H. Janampa, V. Delgado, H. Cornejo, J.C.Muñoz, E. Borda

Date: October 04th, 2013

Subject: **Proposal to Drill Development Well LO6-32D**

It is recommended to drill the proposed well **LO6-32D to development 211 MBO** of reserves in Rio Bravo Formation southwest of Lobitos Field. Programmed TD is 8000' MD (-4277' VSS) and well cost estimated is 3,698 MU$ (Figs. 1, 2 and 7)

LO6-32D is proposed as a directional well; with a maximum vertical angle of 65° towards S 40° W (Figs. 1, 2, 3,4 and 5)

The chance of success (COS) is 85 % (Table A)

The vertical sequence of Rio Bravo suggest that this formation was deposited as Deep sea fan complex in the lower section, grading to Shallow marine sands in the upper section, restricted to coastal facies with presence of shell fragments, with beach sand bars cut by channels. The upper section of Rio Bravo, constitute the main reservoir sands based on petrophysical properties and production, therefore is important to find the zones where these sands were deposited (Figs. 3 and 6)

The proposed location LO6-32D is located 430 and 470 meters from wells LO6-33D and LO6-28D respectively. These wells reached initial production of 796 and 302 BOPD respectively. Well LO6-31D drilled in the same reservoir block had an initial production of 304 BOPD (Figs. 1 and 7)

For a complete evaluation, better understanding and modeling of Rio Bravo reservoir, it is recommended a full logging set of gamma ray, resistivity, and neutron–density (Fig. 2)

The main risks associated with this well location are:

- Sedimentary changes that could reduce the net sand thickness and petrophysics properties.

ECONOMIC SUMMARY

CASE	IP (BOPD)	EUR (MBO)	CAPEX (MUS$)	NPV 10.5% (M$)	PAY OUT (YRS)	AT PIR	ROR (%)
LOW	180	88	3,698	356	7.67	0.10	14
BASE	430	211	3,698	4,990	1.67	1.35	71
HIGH	760	366	3,698	10,867	1.25	2.94	>100

CONSIDERATIONS

Net Revenue Interest %	84%
Discount Rate %	10.5%
Tax	30%
Variable Cost, US$/BL	0.91
Fixed MUS$/Year	36.6
Cost MUS$	3,698

Oil Price according Portfolio MTP 2012: 95 US$/BL for 2013 & 2014 phased 2% yearly from 2015 to 2023.

Base case reserves and IPR for this well are estimated 211 MBO & 430 BOPD respectively, the drilling cost estimated is US$ 3,698 M, and NPV is US$ 4,990 M using portfolio parameters with discount rate of 10.5%
(Figures 9, 10 & Tables A & B)

Proposed well is supported with AFE N° 2214325 (Table B), EIA with Directorial Resolution N° 444-2009-MEM/AAE and risks evaluation according to SIMOP procedure.

Cc:	J. Duarte,	C. Hwang;	O. Nieto	E. Borda
	J. Garzon	R. Gilabert	V. Peralta	Central File
	B. Kim	J. Chuyes	A. Agurto	E. Gonzales
	C. Valdizan	C. Montes	R. Corman	L. Torres V
	C. Ramírez	K. Valencia	J. Gwag	G. Idiaquez

Attached Documents

Fig.1: Geological Prognosis
Fig.2: Structural Map of Rio Bravo Formation showing the Proposed Well LO6-32D
Fig.3: SW-NE 3D seismic Line for proposed well LO6-32D
Fig 4: SW-NE Structural Cross Section for proposed well LO6-32D
Fig.5: Sand Thickness Map of Rio Bravo Formation Showing the Proposed well LO6-32D
Fig.6: NW-SE Stratigraphic Correlation of Rio Bravo, south of LO6 Platform. Wells: LO6-31D, LO6-33D, LO6-28D and LO6-29
Fig 7: Estimated Oil production of Rio Bravo and closest producers wells
Fig 8: Drilling Cost Time-Depth Chart of well LO6-32D
Table A: Economic Summary and Oil rate forecast for well LO6-32D
Table B: AFE for Proposed well LO6-32D

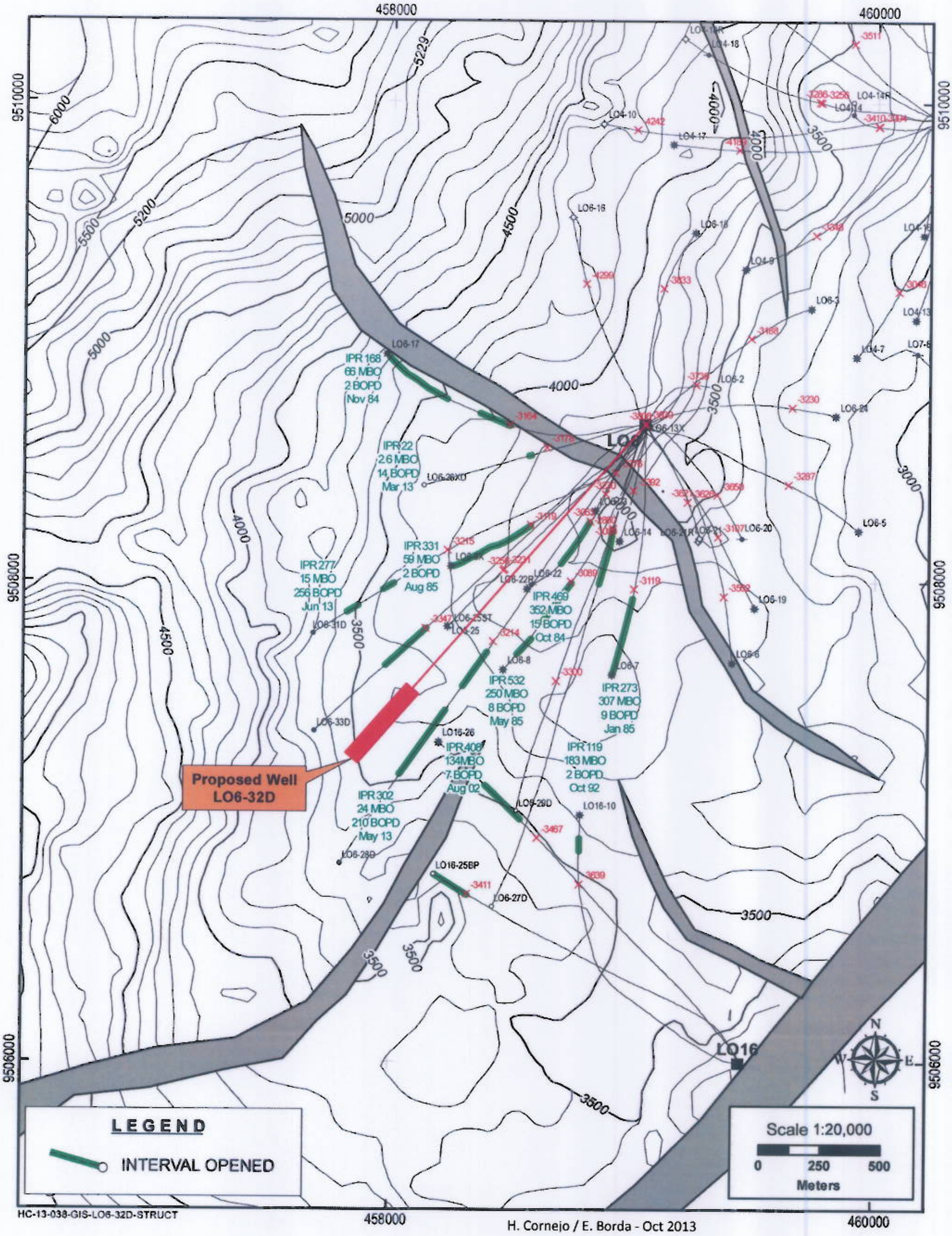


Fig 1: Structural Map of Rio Bravo Formation showing the Proposed Well LO6-32D

GEOLOGIC PROGNOSIS

AREA	OFFICIAL WELL NUMBER	SAVIA PERU SA.	TYPE OF WELL	RIG N°
LOBITOS OFFSHORE		LO6-32D	DEVELOPMENT	PEPESA-40

PRIMARY OBJECTIVE	SECONDARY OBJECTIVE
RIO BRAVO	

SURFACE COORDINATES (UTM)	(WGS-84)	TARGET COORDINATES (UTM)	(WGS-84)
9'508,658.67 MN	459,048.46 ME	9'507,552.89 MN	458,084.13 ME

ELEVAT.		WELL			TARGET		TOTAL DEP.		
KB:	50 FT	DIRECTION OF DEVIATE WELL	S 40.25° W		DRILLED DEPTH	6,432 FT	ESTIMATED FINAL	8,000	FT
WATER DEPTH	335 FT	ANGLE CONDUCTOR FROM VERTICAL	VERT.		VERTICAL DEPTH	3,500 FT	HORIZONTAL DRIFT	6,139	FT
GROUND LEVEL	FT	RECOMENDED DEPTH OF K.O.P.	480	FT	HORIZONTAL DRIFT	4,813 FT	MAX. ANGLE	65.86°	
		BUILD UP ANGLE AT Drop vert. Angle	4.5°/100 FT.		LIMITS (DIAMETER) TO MAIN OBJECTIVE. (MOGOLLON) TOP: 100 ft.		BASE: 100ft.		

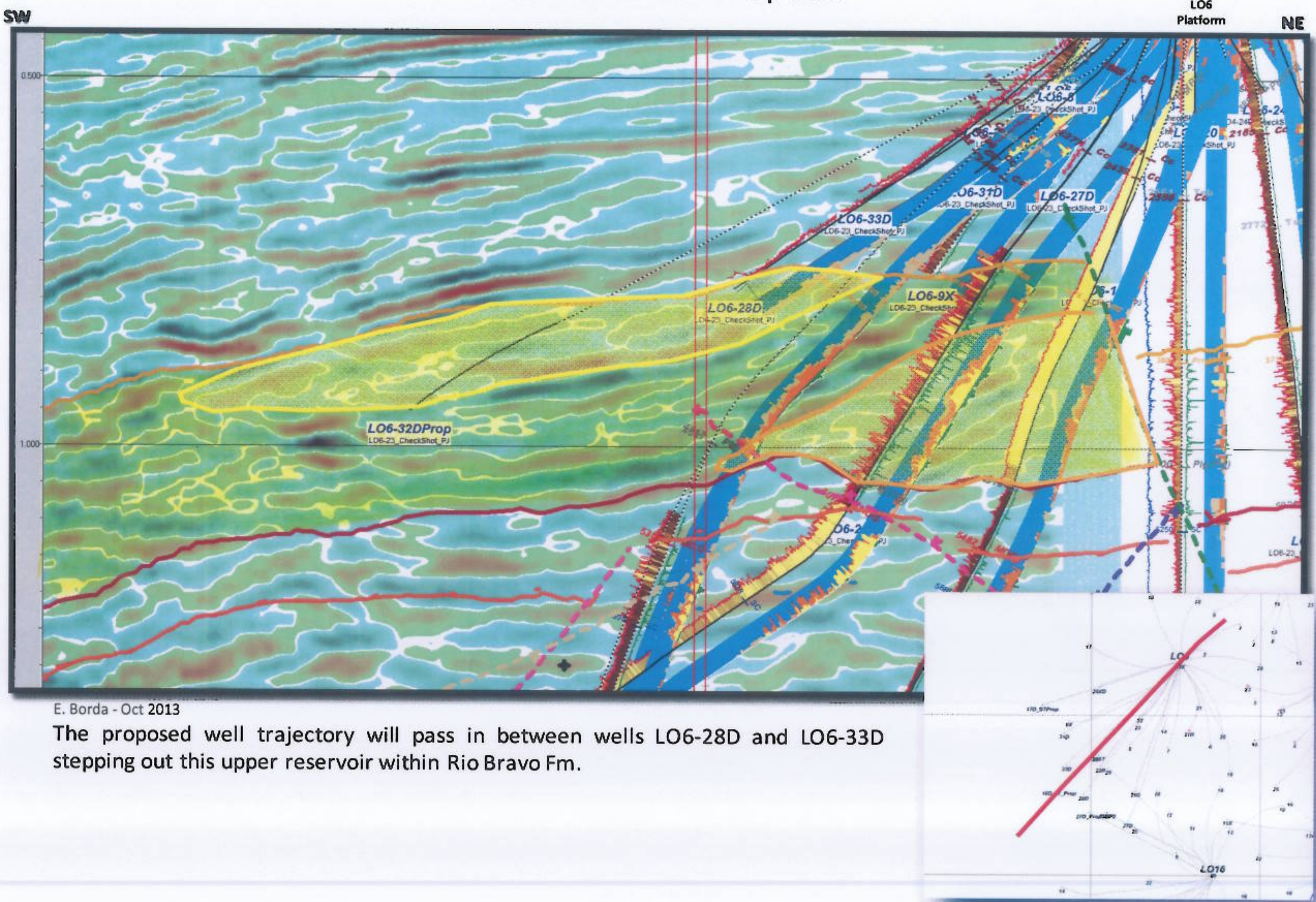
STRATIGRAPHIC SEQUENCE	FORMATION / MEMBER	DRILLED TOP (MD/FT)	VERT. TOP (VD/FT)	SUBSEA TOP (SS/FT)	OBSERVATIONS
	TALARA	AT SEA BOTTOM			
	CHACRA	3,131	2,150	2,100	
	RIO BRAVO	6,432	3,500	3,450	MAIN OBJECTIVE
	TD.	8,000	4,327	4,277	

			REMARKS
CONT. R.	BIT SAMPLES TO BE TAKEN	EVERY 30 FT.FROM SURFACE TO 6000' EVERY 10 FT. FROM 6000' TO TOTAL DEPTH	At 6432 ft. MD. Drop vertical angle 1° /100 ft. To reach 50.20° to TD.
	RECOMMENDED FOR PALEO-PALYNOLOGY	PALEONTOLOGY EVERY 150' FROM SURFACE TO 6000' PALEONTOLOGY EVERY 90' FROM 6000' TO TOTAL DEPTH PALYNOLOGY AT REQUESTED BY LIMA OFFICE	
LOGGING	RECOMMENDED OPEN HOLE	DLL-MSFL-GR; FDC-CNL-GR.	
	RECOMMENDED AFTER CASING	GR-CCL	
	NEARBY WELLS FOR CORRELATION	LO6-22, LO6-29D,LO6-28D,LO6-31D,LO6-33D,LO6-27D	
EVALUAT.	SIDEWALL CORES	SWC • HRCT NOT CONSIDERED	
	CONVENTIONAL CORES	NOT CONSIDERED	
	GAS LOGGER	MUD LOGGING UNIT.	
	FORMATION TESTING	NOT CONSIDERED	

RECOMMENDED BY	DATE:	REVISED BY	DATE:	APPROVED BY	DATE:
H.Cornejo / J.C. Muñoz/E. Borda	October. 2013	V. Delgado	October. 2013	P. Alarcon	October. 2013

Fig 2: Geologic Prognosis

LO6-32D Well Proposal



E. Borda - Oct 2013

The proposed well trajectory will pass in between wells LO6-28D and LO6-33D stepping out this upper reservoir within Rio Bravo Fm.

Fig. 3: SW-NE 3D seismic Line for proposed well LO6-32D

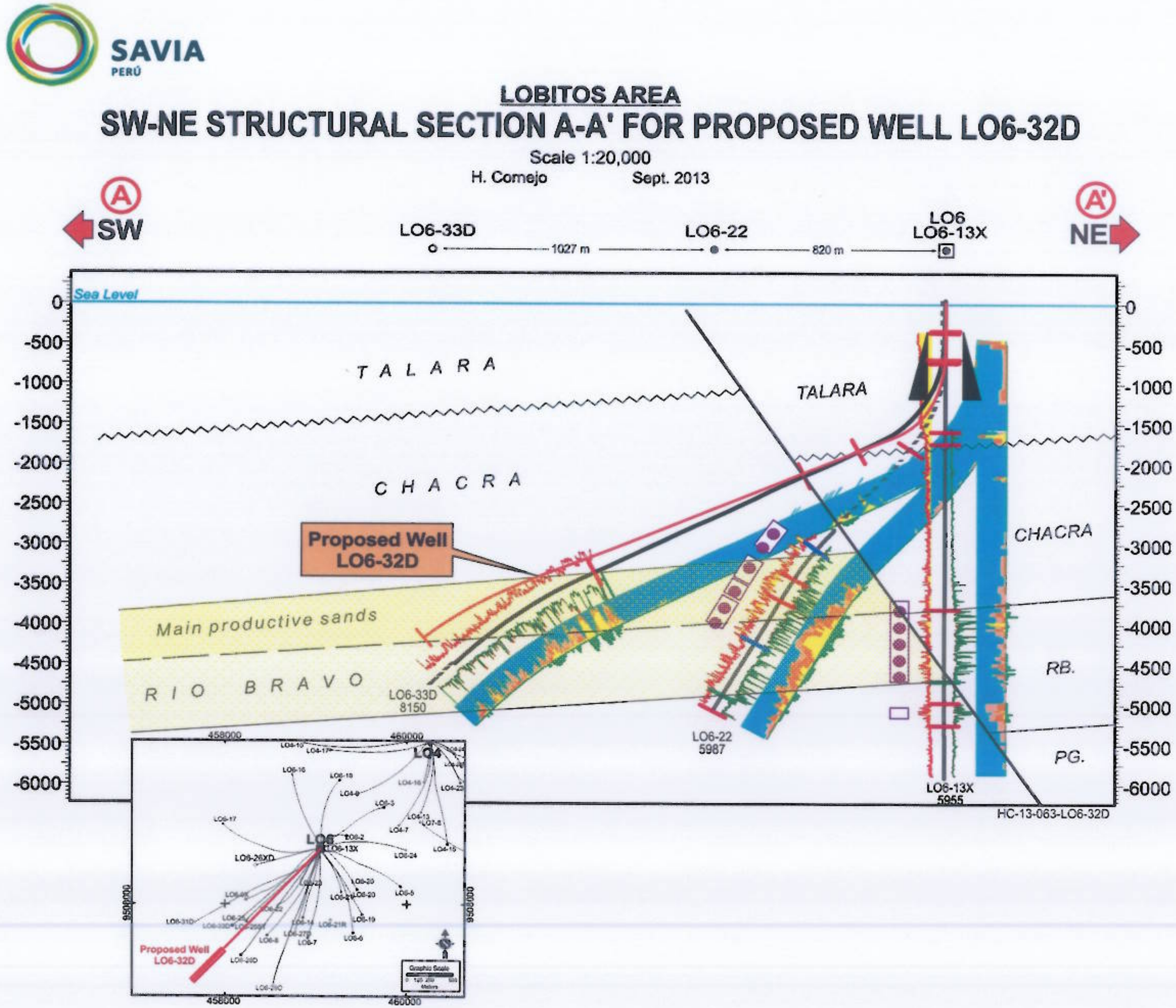


Fig. 4: SW-NE Structural Cross Section for proposed well LO6-32D

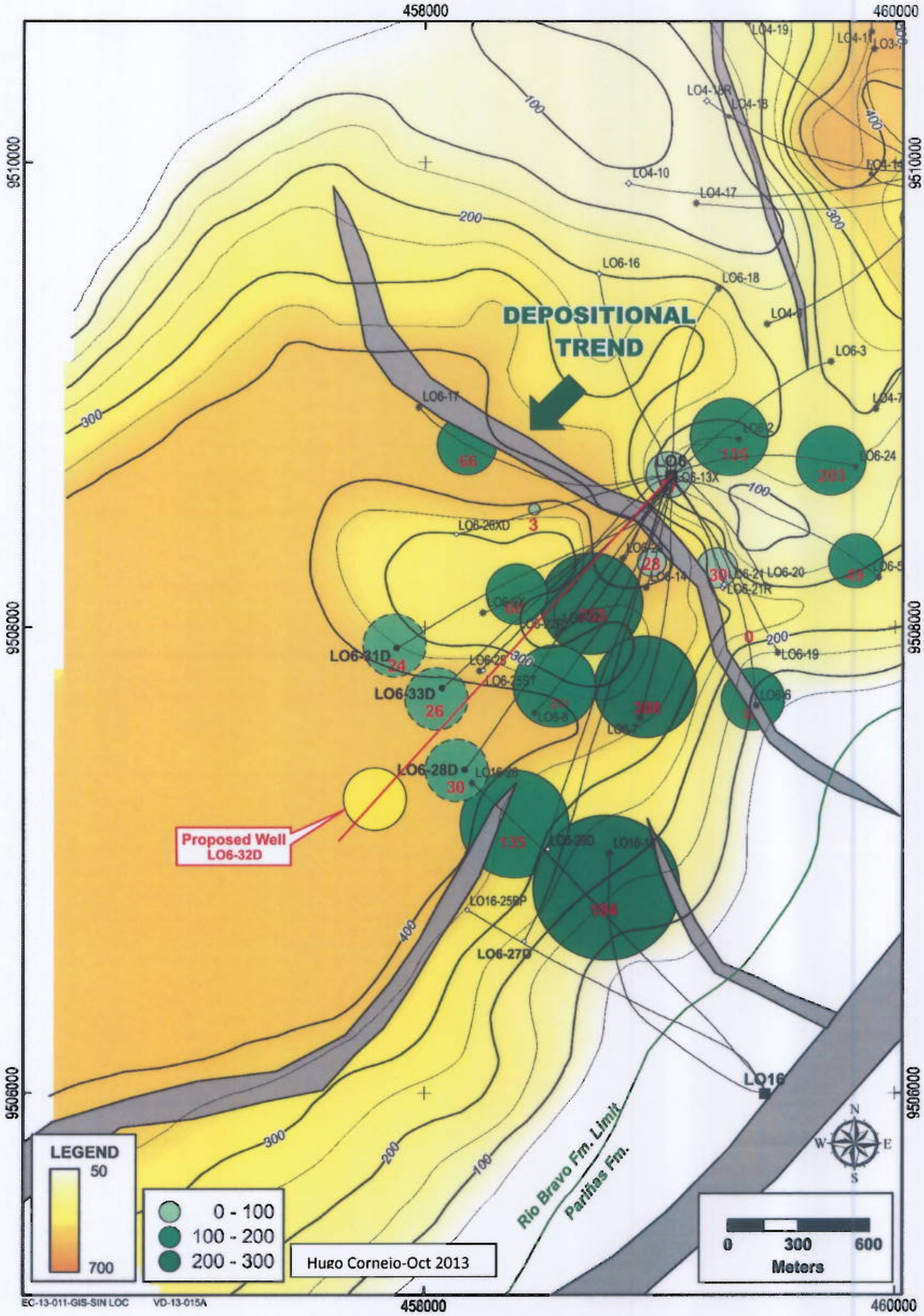


Fig. 5: Gross Sand Thickness Map of Rio Bravo Formation Showing the Proposed well LO6-32D

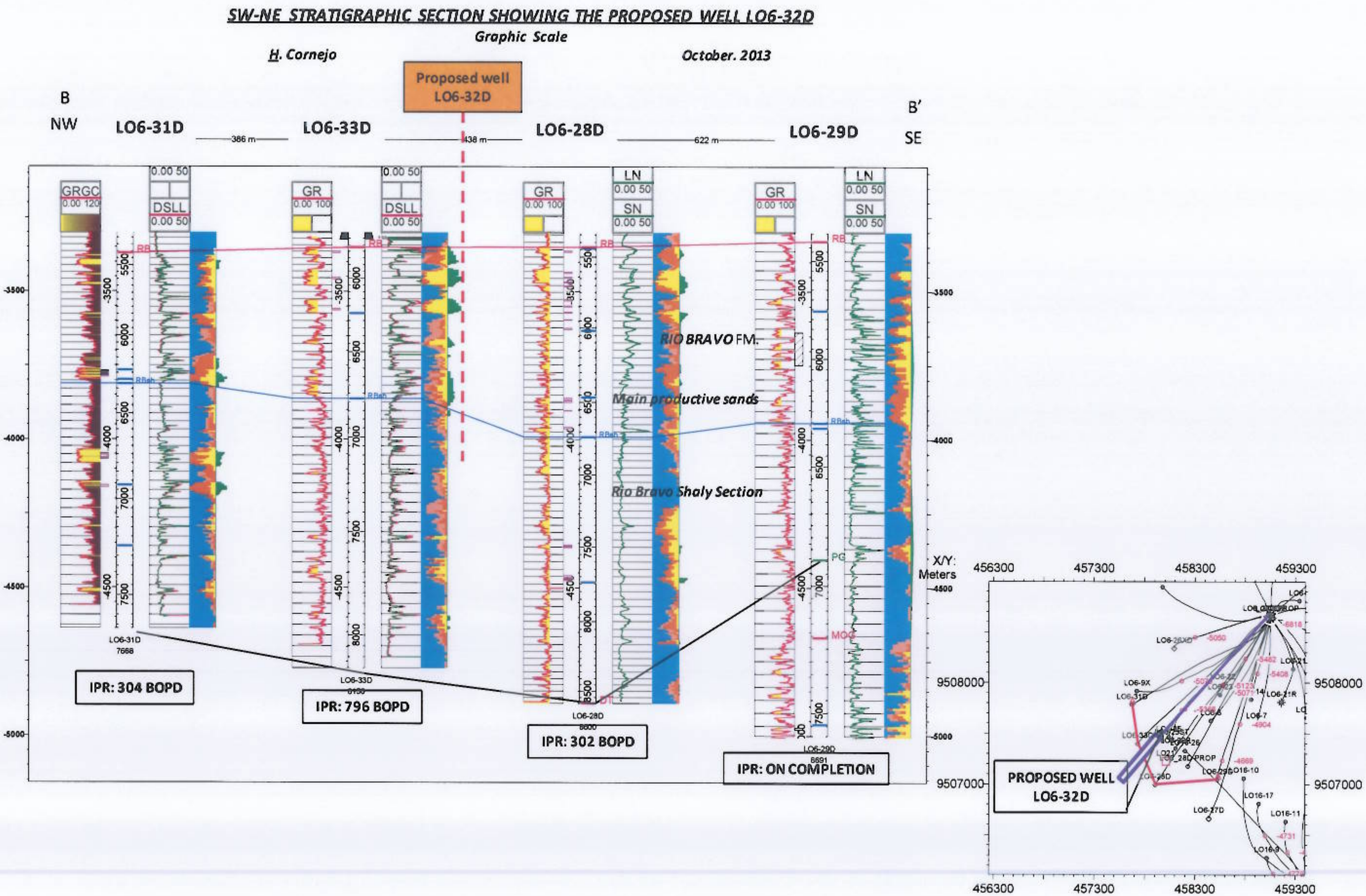
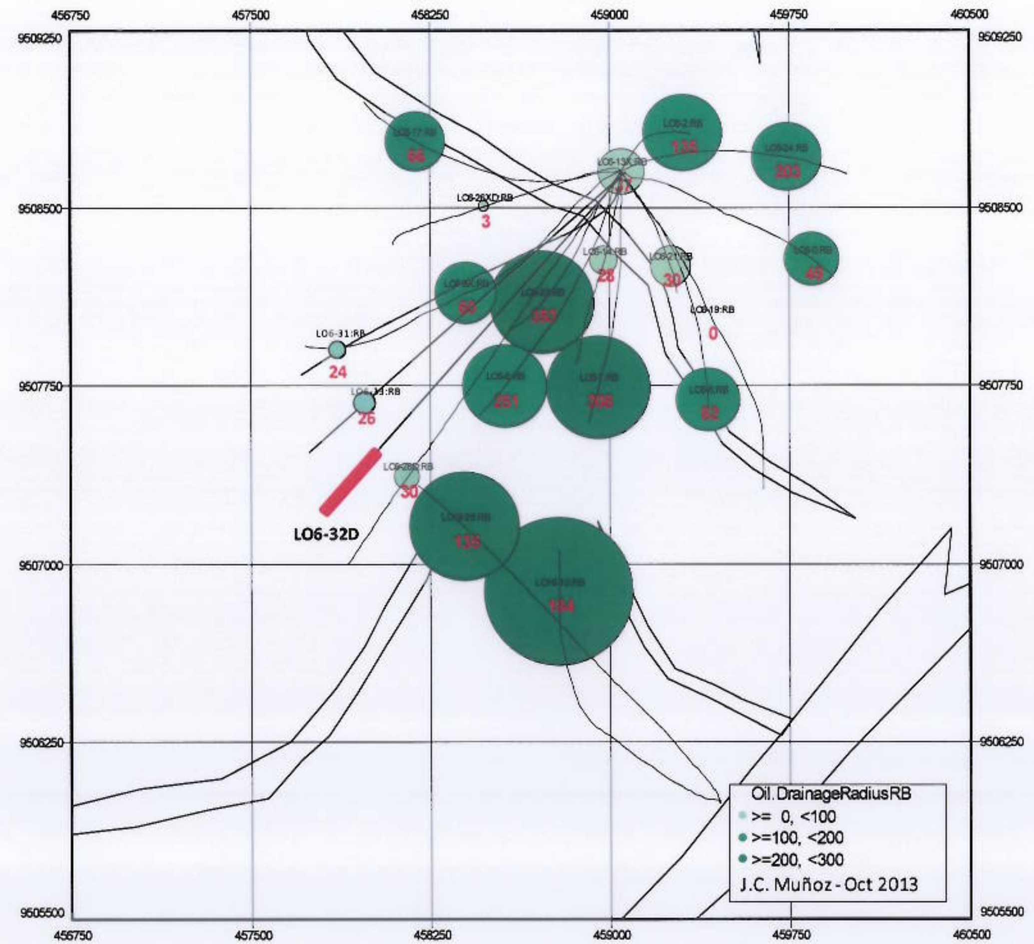


Fig. 6: NW-SE Stratigraphic Correlation of Rio Bravo, south of LO6 Platform. Wells: LO6-31D, LO6-33D, LO6-28D and LO6-29



CASO	BASE ft	TOPE ft	Fm.	Pr inic. psi	Pr act. psi	Depl. %	EUR Mbls	Qo bopd
LOW	4327	3500	RIO BRAVO	2113	2113	0%	88	180
BASE	4327	3500	RIO BRAVO	2113	2113	0%	211	430
HIGH	4327	3500	RIO BRAVO	2113	2113	0%	366	760

Fig. 7: Estimated Oil Production and Reserves of Rio Bravo formation and closest producing wells

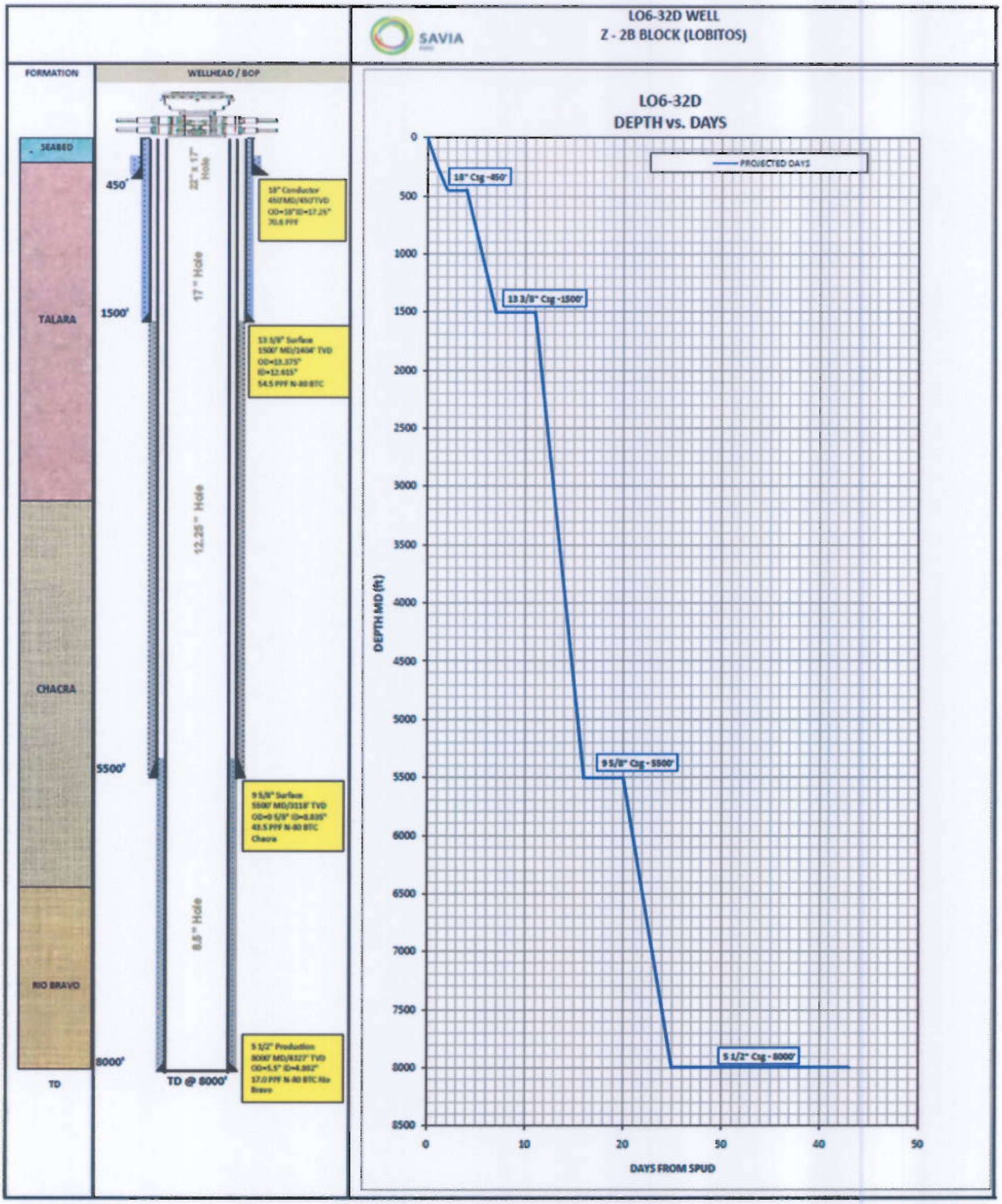


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Fig. 8: Drilling Cost Time-Depth Chart of well LO6-32D

Economic Summary (Savia)

LO6_32D_BASE_NEW

(Nominal values)

Interests & Settings

	Net Revenue	Net Expl	Net Dev	Net Opex
Company (% of Total)	84.00	0.00	100.00	100.00
Company (% of Contr)	100.00	0.00	100.00	100.00
Partner (% of Contr)	0.00	0.00	0.00	0.00
Contr	84.00	0.00	100.00	100.00
NOC	0.00	0.00	0.00	0.00
Model	Peru License R Fact (2003)			
Global Params	Savia Perú			
Escalation Date	2013/01			
Discount Date	2013/01			
Economic Limit	2023/12			

Economic Indicators

Disc. Rate (%)	BT NPV (M$)	AT NPV (M$)	BT PIR (fraction)	AT PIR (fraction)	DPI (fraction)	AT ME (M$)	AT IE (fraction)
0.00	12,674.00	8,428.00	3.43	2.28	3.28	-3,700.00	2.28
10.00	8,185.00	5,107.00	2.21	1.38	2.38	0.00	0
10.50	8,026.00	4,990.00	2.17	1.35	2.35	-3,700.00	1.35
11.1	7,840.00	4,852.00	2.12	1.31	2.31	0	0

	[@10.0 %]	[@10.5 %]	[@11.1%]		
AT ROR (%)	71.23	71.23	71.23	Contr Take (%)	53.01
AT Payout (months)	20.00	20.00	20.00	NOC Take (%)	0.00
F&D ($/BOE)	20.92	20.92	20.92	Gov't Take (%)	46.99
Lifting Costs ($/BOE	2.08	2.04	2		

Cash Flow Breakdown

	(M$)	($/BOE)	(M$) [@10.5 %]	($/BOE) [@10.5%]	(%)
Net Revenue	16,935.00	95.73	12,253.00	69.26	100.00
Less:					
Bonuses & Fees	0.00	0.00	0.00	0.00	0.00
Operating Costs	561.00	3.17	368.00	2.08	3.31
Tariffs	0.00	0.00	0.00	0.00	0.00
Prod & Asset Taxes	0.00	0.00	0.00	0.00	0.00
Capital Costs	3,700.00	20.92	3,700.00	20.92	21.85
Plus: Other Income/Expense	0.00	0.00	0.00	0.00	0.00
Before Tax Cash Flow	12,674.00	71.65	8,185.00	46.27	74.84
Less Income Tax	4,246.00	24.00	3,077.00	17.40	25.07
After Tax Cash Flow	8,428.00	47.64	5,107.00	28.87	49.77

Reserves and Investments

		Project	Contr	Comp WI	Company
Oil	(MSTB)	211.00	177.00	211.00	177.00
Gas	(MMSCF)	0.00	0.00	0.00	0.00
NGL	(MSTB)	0.00	0.00	0.00	0.00
Tax	(MSTB)	0.00	0.00	0.00	0.00
Total	(MBOE)	211.00	177.00	211.00	177.00

		Project	Contr	NOC	Company
Acquisition	(M$)	0.00	0.00	0.00	0.00
Exploration	(M$)	0.00	0.00	0.00	0.00
Development	(M$)	3,700.00	3,700.00	0.00	3,700.00
Abandonment	(M$)	0.00	0.00	0.00	0.00
Total	(M$)	3,700.00	3,700.00	0.00	3,700.00

Comp Cash Flow

All values are Company (Comp) Share unless specified otherwise.

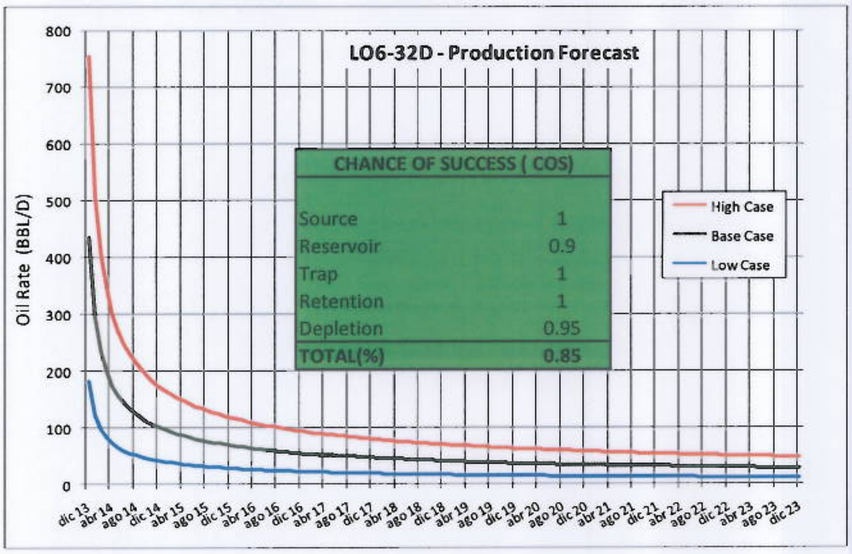
Date	Sales Volume Oil MSTB	Price Oil $/Bbl	Net Revenue Oil M$	Sales Volume Total MBOE	Net Price [BOE] $/BOE	Net Revenue [BOE] M$	(-) Operating Costs M$	(-) Capital Costs M$	Amortization M$	Taxable Income M$	(=) Before Tax Cash Flow M$	(-) Income Taxes M$	(=) After Tax Cash Flow M$	= After Tax Cash Flow [10.5 %]
2013(12)	13.00	95.00	1,071.00	13.00	7.92	1,071.00	15.00	3,700.00	236	820.00	-2,644.00	275	-2,919.00	-2,919.00
2014(12)	56.00	95.00	4,499.00	56	95.00	4,499.00	88.00	—	991	3,420.00	4,411.00	1146	3,265.00	2,955.00
2015(12)	29.00	90.20	2,166.00	29	90.2	2,166.00	63	—	502	1,601.00	2,104.00	537	1,567.00	1,284.00
2016(12)	21.00	92.01	1,657.00	21	92.01	1,657.00	56	—	377	1224	1,601.00	410	1,191.00	883
2017(12)	18.00	93.85	1,391.00	18	93.85	1,391.00	53	—	310	1028	1,338.00	344	994	666
2018(12)	15.00	95.72	1,228.00	15	95.72	1228	50	—	268	909	1177	305	873	530
2019(12)	14.00	97.64	1,116.00	14	97.64	1116	49	—	239	828	1067	277	789	434
2020(12)	12.00	99.59	1,036.00	12	99.59	1036	48	—	218	771	988	258	730	363
2021(12)	11.00	101.58	970.00	11	101.58	970	47	—	200	724	923	242	681	306
2022(12)	11.00	103.61	920.00	11	103.61	920	46	—	186	688	874	231	644	262
2023(12)	10.00	105.69	880.00	10	105.69	880	46	—	174	660	834	221	613	226
Total	211.00	97.47	16,935.00	211.00	—	16,935.00	561.00	3,700.00	3,700.00	12,674.00	12,674.00	4,246.00	8,428.00	4,990.00

Peep Version 2009.1

CONSIDERATIONS

Net Revenue Interest %	84%
Discount Rate %	10.5%
Tax	30%
Variable Cost, US$/BL	0.91
Fixed MUS$/Year	36.6
Cost MUS$	3,698

Oil Price according Portfolio MTP 2012: 95 US$/BL for 2013 & 2014 phased 2% yearly from 2015 to 2023.



J.C. Muñoz - Oct 2013

Table A: Economic summary and Oil rate forecast for well LO6-32D

SAVIA

SAVIA PERU S.A.

CIA	ACD	BUDGET ITEM	A F E No.

FU	WELL DESCRIPTION	OFICIAL NUMBER	MM / DD / AA
	LO6-32D	SAV-Z2B-24-LO6-32D	

			TOTAL ESTIMATED DAYS			
FU	TYPE OF WELL	MOV / COND	DRILLING	COMPLETION	EST FOOTAGE	AREA
	DEVELOPMENT	3	24	18	8000	LOBITOS

FU	GEN	CC	AREA

WELL COST BREAKDOWN

SUB	DESCRIPTION	QUANTITY	UNIT COST	SUB-TOTAL	TOTAL US$
	OUTSIDE SERVICES:				
201	DRILLING RIG	21 24			961,500
203	DIRECTIONAL DRILLING				222,100
204	MUD LOGGING	31	1500		46,500
205	MUD ENGINEERING	31 12	1200 900		48,000
206	CEMENT. CONDUCT.				15,990
206	CEMENT. SURF. CSG				28,590
206	CEMENT. INTERM. CSG.				29,190
206	CEMENT. OTHERS				26,930
206	CEMENT. CASING 7"				0
206	CEMENT. CASING 5 1/2"				31,690
207	ELECTRIC LOGGING				190,000
208	PERFORATING				60,000
209	STIMULATION				90,000
211	TUBULAR INSPECTION				8,250
213	DIVING				24,000
212	HYDRAULIC TONGS				66,500
219	WELL TESTING				16,000
221	TOOL SERVICES				70,000
224	METALIC STRUCTURES CUT & WELD				10,000
226	CRANE MAINTENANCE				15,000
228	MACHINE WORK				7,500
229	BARGE OPERATIONS				0
231	BOAT OPERATIONS				0
237	MATER. & EQUIP. TRANSP.				31,500
240	WATER FURNISHMENT				15,000
244	TOOL RENTAL				56,650
248	CATERING				68,850
249	CONSULTING				56,250
252	ENVIROMENTAL PROTECTION				22,500
	TOTAL OUTSIDE SERVICES:				**2,218,430**
	MATERIALS & SUPPLIES:				
301	FITTING SCREWED				500
303	VALVES AND PARTS				1,500
304	API FLANGES & RING GASKET				1,000
306	HARDWARE				2,000
325	BITS				121,500
326	TOOLS FOR DRILLING				44,660
327	COMPLETIONS				75,000
328	FLOATING EQUIPMENT - CMT.				22,410
329	PRODUCTION FACILITIES EQUIP.				2,000
335	OTHERS TUBULAR CONNECTIONS				7,500
336	STRUCTURAL CONST. MAT.				2,200
340	WELDING MATERIAL				500
341	MAT. CMT. CONDUCT.				18,000
341	MAT. CMT. SURF. CSG.				26,250
341	MAT. CMT. INTERM. CSG.				35,100
341	MAT. CMT. CASING 7"				0
341	MAT. CMT. CASING 5 1/2"				28,500
341	MAT. CMT. OTHERS				11,200
342	STIMULATION MATERIAL				90,000
343	DRILLING / COMPLETION FLUIDS				212,360
344	CONDUCTORS	450	37.52		16,880
344	SURFACE CSG.	1500	35.11		52,670
344	INTERMED. CSG. (9 5/8")	5500	28.38		156,090
344	7" CASING	0	18.33		0
344	5 1/2" CASING	8000	11.53		92,240
344	2 7/8" TUBING	7600	4.68		35,570
346	DIESEL-FUEL		6.00		422,100
347	OIL & GRASES				2,150
	TOTAL MATERIALS & SUPPLIES:				**1,479,880**
			TOTAL PROJECT COST US $		**3,698,370**

APPROVAL BY : ______________________ DATE : 1

Drilling Deparment- Oct 2013

Table B: AFE for proposed well LO6-32D