DIMENSION BID

PETRONAS

TIONG B
PUMPING OPERATION

Revision:	4
Prepared for:	Hashimi
Date Prepared:	11 June 2024
Well:	B-01 to B-15
Field:	Tiong
Operation Region:	PMA
Prepared by:	Muhammad Hafiz Saharuddin
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DESIGN VERIFICATION

PREPARED BY DB CTS Operation Engineer	 Muhammad Hafiz Saharuddin	11/6/2024 Date
REVIEWED BY DB CTS Technical Advisor	 Kung Yee Han	11/6/2024 Date
APPROVED BY DB CTS General Manager	 Alif Amirul Adenan	11/6/2024 Date
APPROVED BY PCSB Tiong Well Intervention Engineer	Hashimi	Date
APPROVED BY PCSB Technical Professional Well Intervention, PMA	Azwan Kifli	Date
APPROVED BY PCSB Head of Cluster 1 Well Intervention, PMA	Asraf M Nazri	Date

Remark: Do not execute the procedures in this document if it is not fully approved and signed by all parties.

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5	Alif Adenan	General Manager	DB	Kemaman	011 – 1225 7044

REVISION HISTORY

Rev. No	Section	Date	Revised By
0	All	28/2/2024	Muhammad Hafiz Saharuddin
1	Additional Bullheading Pumping 1.5 x (Tubing + Annulus volume)	2/5/2024	Muhammad Hafiz Saharuddin
2	Additional remarks, in the event during bullheading, pumping pressure reach to MASTP– To get town approval before proceed with Pumping above MASTP.	15/5/2024	Muhammad Hafiz Saharuddin
3	Include monitor period after complete 1.5x tubing / Annulus volume	4/6/2024	Muhammad Hafiz Saharuddin
4.	Revise first bullheading pumping to injectivity test	11/6/2024	Muhammad Hafiz Saharuddin

TABLE OF CONTENT

OBJECTIVES

The objective of this job is;

1. To perform injectivity test and pressure test plug after slickline set.
2. To displace fluid in A-Anulus with TSW (if required).

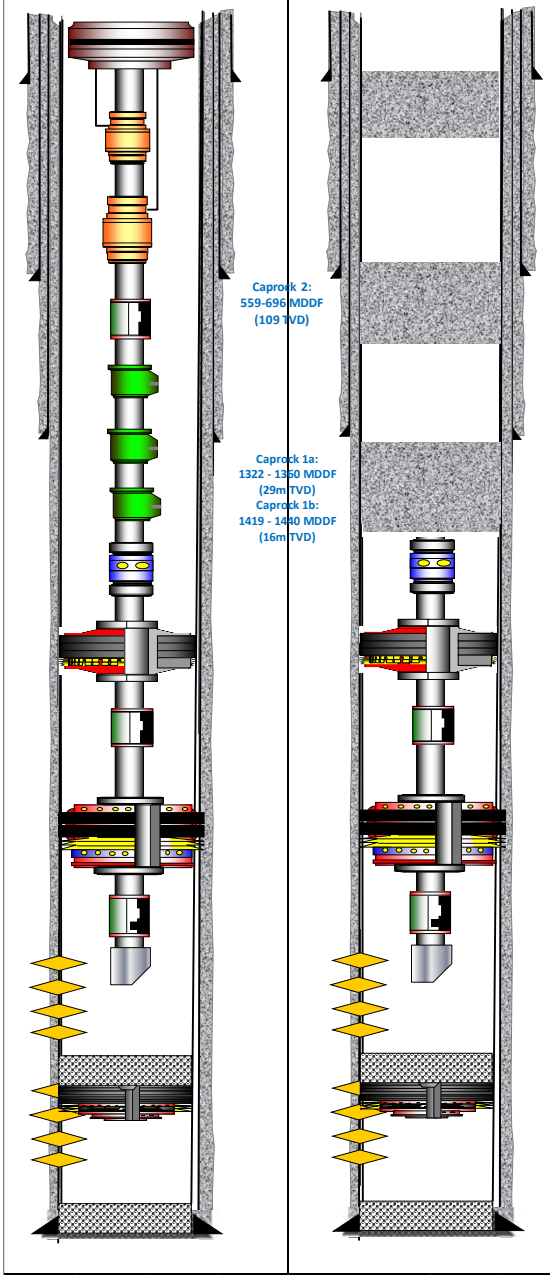
WELL DIAGRAM

CURRENT VS PLAN TIONG B-01

FIELD/PLATORM :	TIONG B
SLOT :	9
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	1877.4
MAX ANGLE :	47.5
XMT/WH :	Single 3-1/8" WKM

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			554	
10-3/4"	40.5	BTC			1020	
7"	23	BTC			2301	
3.5"	9.3	EUE			2069	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi
16" Casing	Class G	15.9	Surface	1000
10-3/4" Casing	Class G	15.9	Surface	1000
7" Casing	Class G	15.9	Surface	2200



EXISTING / PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
	SURFACE	TOC (10-3/4")	
	SURFACE	TOC (7")	
	#REF!	#REF!	1.61- 6.86
	171.00	24" Conductor Shoe	
	376.00	Possible Shallow Gas	
	554.00	16" Conductor	
	590 - 740	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #2	36.92 - 36.58
	700-1020	Flow Point	
	1,020.00	10-3/4" Casing Shoe	
	1310 - 1460	AWCA / SECTION MILL & CEMENT PLUG # 1	39.46 - 39.15
	1,610.00	Cut Tubing	
	2,056.00	Close SSD	
	2,061.00	Option 1 (Nippleless Plug)	
	2,061.70	RH PACKER	
	2,066.00	Option 2 (X Plug)	
	2,067.00	LOCATOR WB PACKER (PERMANENT)	
	2,068.00	Option 3 (XN Plug)	
	2,069.70	EOT	
	2197 - 2200	PERF (J20)	
	2,210.00	TOC	
	2,301.00	7' Casing Shoe	

CURRENT VS PLAN TIONG B-02

FIELD/PLATORM :	TIONG B
SLOT :	17
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2,428.60
MAX ANGLE :	43.5 @ 931.7
XMT/WH :	Single 3-1/8" WKM

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			553.8	
10-3/4"	40.5	BTC			1150.6	
7"	23	BTC			2428.6	
3.5"	9.3	EVE			2358.2	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	Surface	

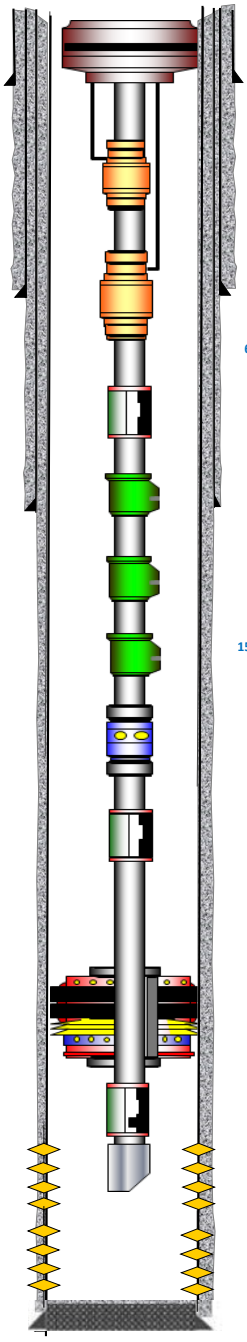
EXISTING	PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
		SURFACE 76.00	TOC (10-3/4") TOC (7")	
		171.00 115 -175	24" Conductor Shoe Surface Plug	7.61 - 11.61
Caprock #4: 634-834m (128 m TVD)		553.80 800 - 950	16" Conductor AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #2	46.25 - 47.0
		1,150.60 1120 - 1200	10-3/4" Casing Shoe Flow Point	
Caprock 1 1428.9 - 1508.3 (59.5 m TVD)		1378 - 1528	AWCA / SECTION MILL & CEMENT PLUG # 1	43.00 - 40.45
		1,678.00	Tubing Cut	
		2,305.00	Option 1 (Nippleless Plug)	
		2,310.00	Separation Sleeve / C'Sub	
		#REF!	RH PACKER	
			PERF	
		#REF!	LOCATOR WB PACKER (PERMANENT)	
		2,358.20	EOT	
		2361 - 2363	PERF (J20/21)	
		2,428.60	7' Casing Shoe (TOC: TBA)	

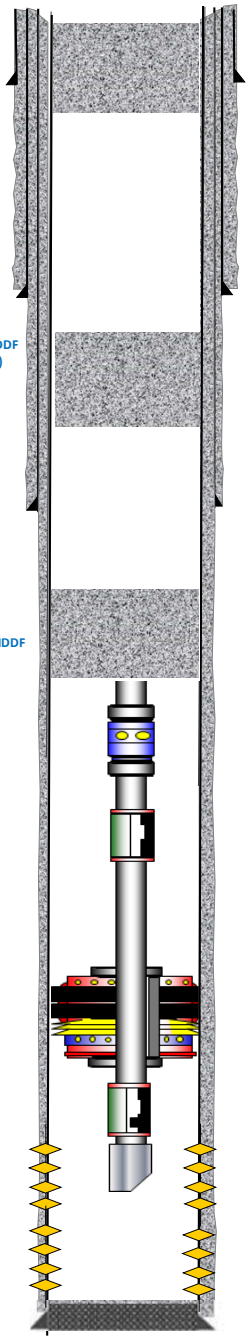
CURRENT VS PLAN TIONG B-03

FIELD/PLATORM :	TIONG B
SLOT :	12
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2615.1
MAX ANGLE :	57.25
XMT/WH :	Single 3-1/8" WKM

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			582.4	
10-3/4"	40.5	BTC			1114	
7"	23	BTC			2613.5	
3.5"	9.3	EUE			2404.3	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	1000
10-3/4" Casing	Class G	15.9	Surface	1000
7" Casing	Class G	15.9	Surface	2200





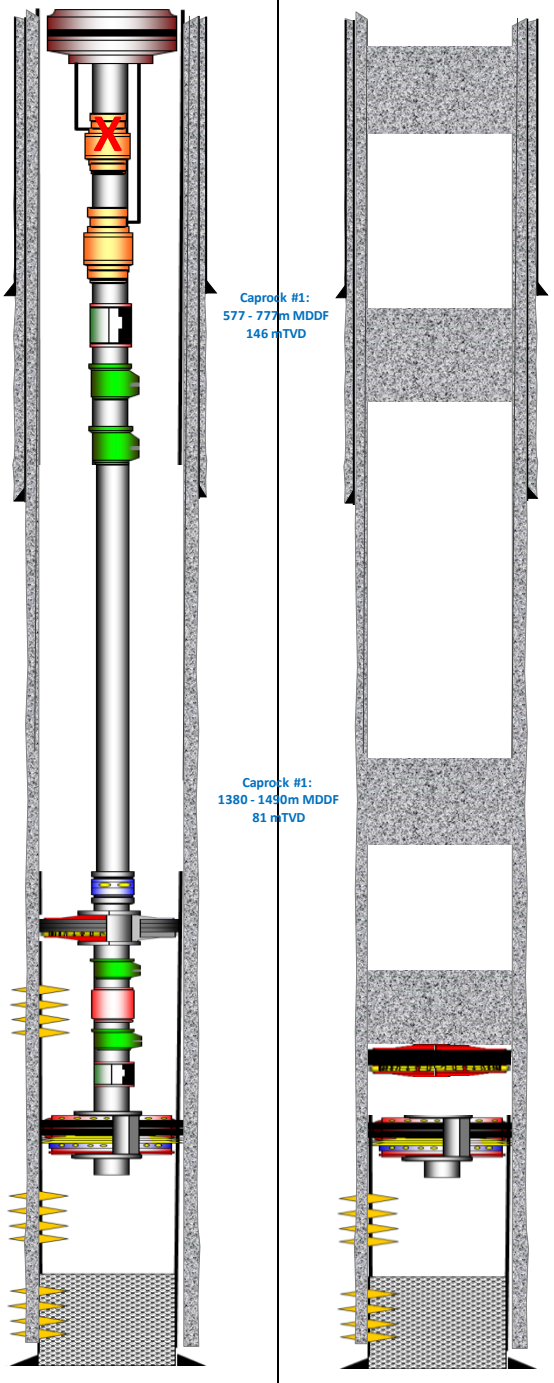
EXISTING / PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
	SURFACE	TOC (10-3/4")	
	SURFACE	TOC (7")	
	115 -175	Surface Plug	7.06 - 7.79
	171.00	24" Conductor Shoe	
	180 - 535	Flow Point	
	388.00	Possible Shallow Gas	
	582.40	16" Conductor	
	660 - 810	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #2	46.66 - 50.25
	1,114.00	10-3/4" Casing Shoe	
	1503 - 1653	AWCA / SECTION MILL & CEMENT PLUG # 1	56.50 - 56.96
	1,803.00	Tubing Cut	
	2,392.00	Close SSD	
	2,397.00	Option 1 (Nippleless Plug)	
	2,398.00	Option 2 (X Plug)	
	2,400.00	LOCATOR WB PACKER (PERMANENT)	
	2,402.00	Option 3 (XN Plug)	
	2,404.30	EOT	
	2532-2536	PERF (J20/21)	
		Top of Perf (2539)	
	2361-2363	PERF (J20/21)	
	2,613.50	7' Casing Shoe (TOC: Surface)	

CURRENT VS PLAN TIONG B-04

FIELD/PLATORM :	TIONG B
SLOT :	13
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2,391.20
MAX ANGLE :	46
XMT/WH :	Single 3-1/8" WKM

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			600.5	
10-3/4"	40.5	BTC			1057.7	
7"	23	BTC			2391.2	
3.5"	9.3	EVE			2215	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	Surface	



DEPTH m-MDDF	DESCRIPTION	Deg ◦
SURFACE TBA	TOC (10-3/4") TOC (7")	
115 -175 134.00 171.00	Surface Plug HUD 24" Conductor Shoe	6.84 - 10.50
600.50 750 - 900	16" Conductor AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #3	43.75 - 41.25
1,057.70	10-3/4" Casing Shoe	
1360 - 1510	AWCA / SECTION MILL & CEMENT PLUG # 2	44.50 - 46.00
1,890.10	RH PACKER	
1801 - 1951	Isolation Plug # 1 (150 m)	45.50 - 37.00
1919.5 - 1921.5	PERF (I-100)	
1,951.00	Bridge Plug	
2,211.90	LOCATOR WB PACKER (PERMANENT)	
2,215.00	EOT	
2218 - 2222	PERF (J-18)	
2,230.00	TOC	
2,391.20	7' Casing Shoe	

FIELD/PLATORM :	TIONG B
SLOT :	13
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2,392.20
MAX ANGLE :	48.5
XMT/WH :	Single 3-1/8" WKM

CURRENT VS PLAN TIONG B-05

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			566.3	
10-3/4"	40.5	BTC			1039	
7"	23	BTC			2392.2	
3.5"	9.3	EVE			2216	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	Surface	

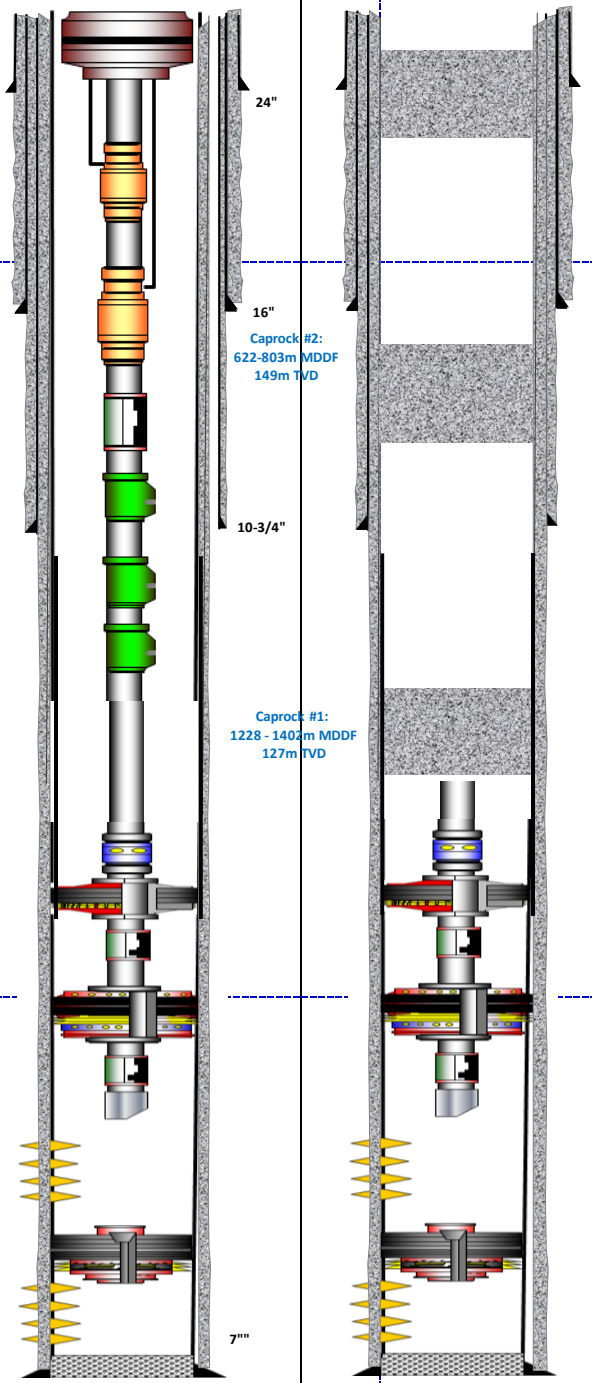
EXISTING	PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
		SURFACE	TOC (10-3/4")	
		SURFACE	TOC (7")	
		115 -175	Surface Plug	1.20 - 6.28
		171.00	24" Conductor Shoe	
		134.00	FXE VALVE	
		566.30	16" Conductor	
Caprock #2: 520 - 720m MDDF 165m TVD		700 - 850	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #2	43.70 - 47.25
		1,039.00	10-3/4" Casing Shoe	
		1,042.00	Flow Point	
Caprock #1: 1269 - 1446m MDDF 125m TVD		1315 - 1465	AWCA / SECTION MILL & CEMENT PLUG # 1	45.00 - 43.98
		1,615.00	Tubing Cut	
		1,890.00	Close SSD	
		1,895.00	Option 1 (Nippleless Plug)	
		1,903.20	RH PACKER	
		1928 / 2185	Flow Point	
		1,917.00	Option 2 (X Plug)	
		2317.1 - 2325	PERF (J-20 Middle)	
		2,209.00	Option 3 (XN Plug)	
		2,211.70	LOCATOR W3 PACKER (PERMANENT)	
		2325 - 2338	PERF (J20 Lower)	
		2,364.00	PBTD	
		2,392.20	7' Casing Shoe	

FIELD/PLATORM :	TIONG B
SLOT :	14
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2,307.00
MAX ANGLE :	48.5
XMT/WH :	Single 3-1/8" WKM

CURRENT VS PLAN TIONG B-06

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			581	
10-3/4"	40.5	BTC			1008	
7"	23	BTC			2307	
3.5"	9.3	EVE			2135	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	Surface	



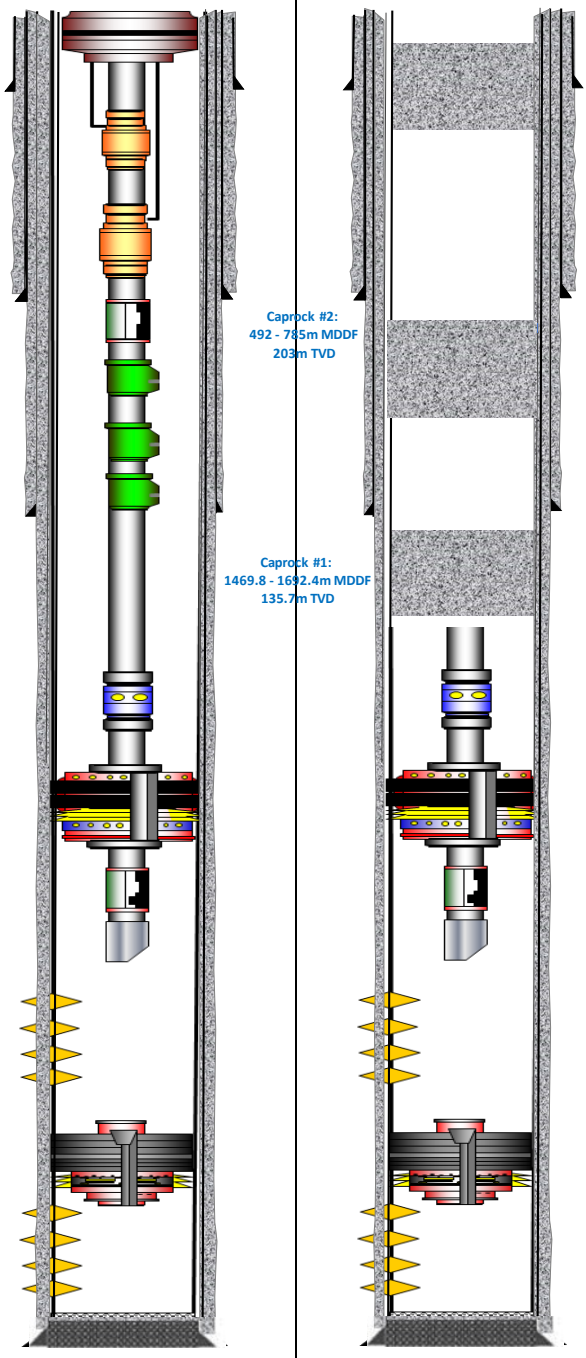
EXISTING / PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
	SURFACE	TOC (10-3/4")	
	SURFACE	TOC (7")	
	115 -175	Surface Plug	1.75 - 9.29
	171.00	24" Conductor Shoe	
	440 - 628	Flow Point	
	581.00	16" Conductor	
	750 - 900	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #2	34.50 - 33.78
	1,008.00	10-3/4" Casing Shoe	
		TOC (TBA)	
	1,009.00	Flow Point	
	1272 - 1422	AWCA / SECTION MILL & CEMENT PLUG # 1	43.10 - 42.64
	1,572.00	Tubing Cut	
	2,104.00	Close SSD	
	2,109.00	RH PACKER	
	2,115.00	Option 1 (Nippleless Plug)	
	2,130.00	Option 2 (X Plug??)	
	2,131.00	WB PACKER	
	2,135.00	Option 3 (XN Plug)	
	2177.5 - 2182	PERF (J19)	
	2,131.30	LOCATOR	
		WB PACKER (PERMANENT)	
	2,135.00	EOT	
	2197.9 - 2182	PERF (J20)	
	2,307.00	7' Casing Shoe	
		(TOC: TBA)	

CURRENT VS PLAN TIONG B-07

FIELD/PLATORM :	TIONG B
SLOT :	18
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2,739.00
MAX ANGLE :	56.5
XMT/WH :	Single 3-1/8" WKM

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			576.7	
10-3/4"	40.5	BTC			1154	
7"	23	BTC			2739	
3.5"	9.3	EVE			2529	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	Surface	



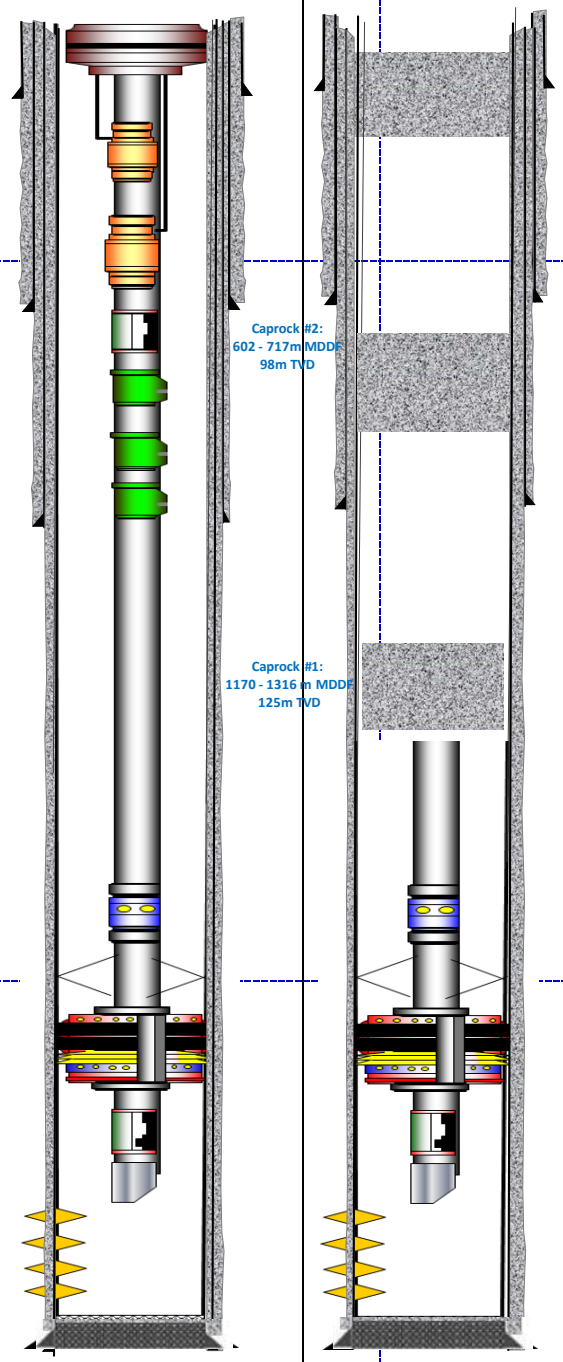
EXISTING / PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
	SURFACE	TOC (10-3/4")	
	TBA	TOC (7")	
	#REF!	#REF!	7.17 - 10.50
	171.00	24" Conductor Shoe	
	134.00	FXE VALVE	
	576.70	16" Conductor	
	750 - 900	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #2	56.25 - 55.25
	TBA	Flow Point	
	1,154.00	10-3/4" Casing Shoe	
	1562 - 1712	AWCA / SECTION MILL & CEMENT PLUG # 1	51.25 - 55.00
	1,862.00	Tubing Cut	
	2,519.00	Close SSD	
	2,522.00	Option 1 (Nippleless Plug)	
	#REF!	LOCATOR WB PACKER (PERMANENT)	
	2,528.00	Option 2 (XN Plug)	
	2,529.00	EOT	
	2590 - 2595	PERF (J-18)	
	#REF!	BRIDGE PLUG	
	2,739.00	7' Casing Shoe (TOC: TBA)	

FIELD/PLATORM :	TIONG B
SLOT :	10
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2,114.00
MAX ANGLE :	33.3
XMT/WH :	Single 3-1/8" WKM

CURRENT VS PLAN TIONG B-08

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			561	
10-3/4"	40.5	BTC			977	
7"	23	BTC			2114	
3.5"	9.3	EVE			1896	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	Surface	



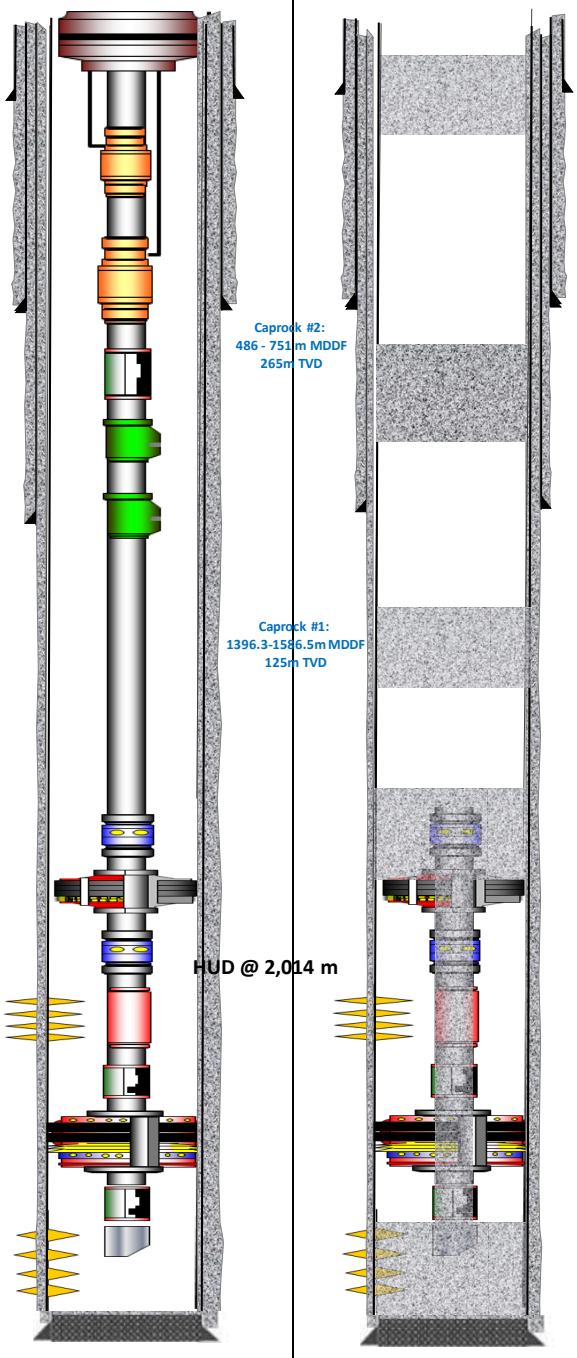
EXISTING / PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
	SURFACE	TOC (10-3/4")	
	TBA	TOC (7")	
	115 -175	#REF!	2.67 - 10.50
	171.00	24" Conductor Shoe	
	142.00	FXE VALVE	
	275 - 300	Flow Point	
	360 - 425	Flow Point	
	561.00	16" Conductor	
	650 - 800	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #2	32.25 - 31.25
	960 - 980	Flow Point	
	977.00	10-3/4" Casing Shoe TOC (TBA)	
	1186 - 1336	AWCA / SECTION MILL & CEMENT PLUG # 1	31.25 - 30.5
	1,486.00	Tubing Cut	
	1,902.00	Close SSD	
	1,905.00	Option 1 (Nippleless Plug)	
	1,909.00	LOCATOR WB PACKER (PERMANENT)	
	1,913.00	Option 2 (XN Plug)	
	1,914.00	EOT	
	2017 - 2023	PERF (J20)	
	2030 - 2033	PERF (J21)	
	2,056.00	PBTD	
	2,114.00	7' Casing Shoe	

CURRENT VS PLAN TIONG B-09

FIELD/PLATORM :	TIONG B
SLOT :	2
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2,483.00
MAX ANGLE :	33.3
XMT/WH :	Single 3-1/8" WKM

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			579	
10-3/4"	40.5	BTC			1136	
7"	23	BTC			2507	
3.5"	9.3	EVE			2334.1	

16" Casing	Class G	15.9	Surface	TREAT' P (psi)
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	Surface	



EXISTING / OPTION 1	DEPTH m-MDDF	DESCRIPTION	Deg ◦
	SURFACE	TOC (10-3/4")	
	SURFACE	TOC (7")	
	115 -175	SURFACE PLUG	2.17 - 6.75
	171.00	24" Conductor Shoe	
	579.00	16" Conductor	
	700 - 850	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #3	48.5 - 53.00
	1,136.00	10-3/4" Casing Shoe	
	TBC	Flow Point	
	1466 - 1616	AWCA / SECTION MILL & CEMENT PLUG # 2	48.75 - 48.50
	1,992.00	Tubing Cut	
	1,997.00	Close SSD	
	2,004.00	RH PACKER	
	2,020.00	CLOSE SSD	
	1892 - 2483	ZONAL ISOLATION Plug # 1	44.00 - 29.25
	2032-2033.5	PERF (I-100)	
	2,043.00	Bridge Plug	
	#REF!	LOCATOR WB PACKER (PERMANENT)	
	2,334.10	EOT	
	2124 - 2433	PERF	
	2,483.00	PBTD	
	2,507.00	7' Casing Shoe	

FIELD/PLATORM :	TIONG B
SLOT :	16
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2470
MAX ANGLE :	50.7
XMT/WH :	Single 3-1/8" WKM

CURRENT VS PLAN TIONG B-10

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			173	
16"	75	BTC			612.6	
10-3/4"	40.5	BTC			1125.6	
7"	23	BTC			2470	
3.5"	9.3	EUE			2384	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	No return	

EXISTING	PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
		SURFACE No return 115 -175 173.00	TOC (10-3/4") TOC (7") SURFACE PLUG 24" Conductor Shoe	9.34 - 13.75
		476.00 565 - 877	Possible Shallow Gas Flow Point	
Caprock #2: 638 - 730 m MDDF 63.1m TVD		612.60 700 - 850	16" Conductor AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #3	46.75 - 48.75
		1,125.60	10-3/4" Casing Shoe TOC (Surface)	
Caprock #1: 1518.3 - 1571.3 m MDDF 35.7m TVD		1456 - 1591	AWCA / SECTION MILL & CEMENT PLUG # 2	48.25 - 46.25
		2,312.00 2,317.00	Tubing Cut Close SSD	
		2302 - 2445	Cement Plug #1	16.3 - 9.50
		2,323.30	RH PACKER	
		2,335.00	CLOSE SSD	
		2372 - 2380	PERF (J19)	
		#REF!	LOCATOR WB PACKER (PERMANENT)	
		2,384.00	EOT	
		2388 - 2391	PERF (J20)	
		2,445.00 2,470.00	PBTD 7' Casing Shoe	

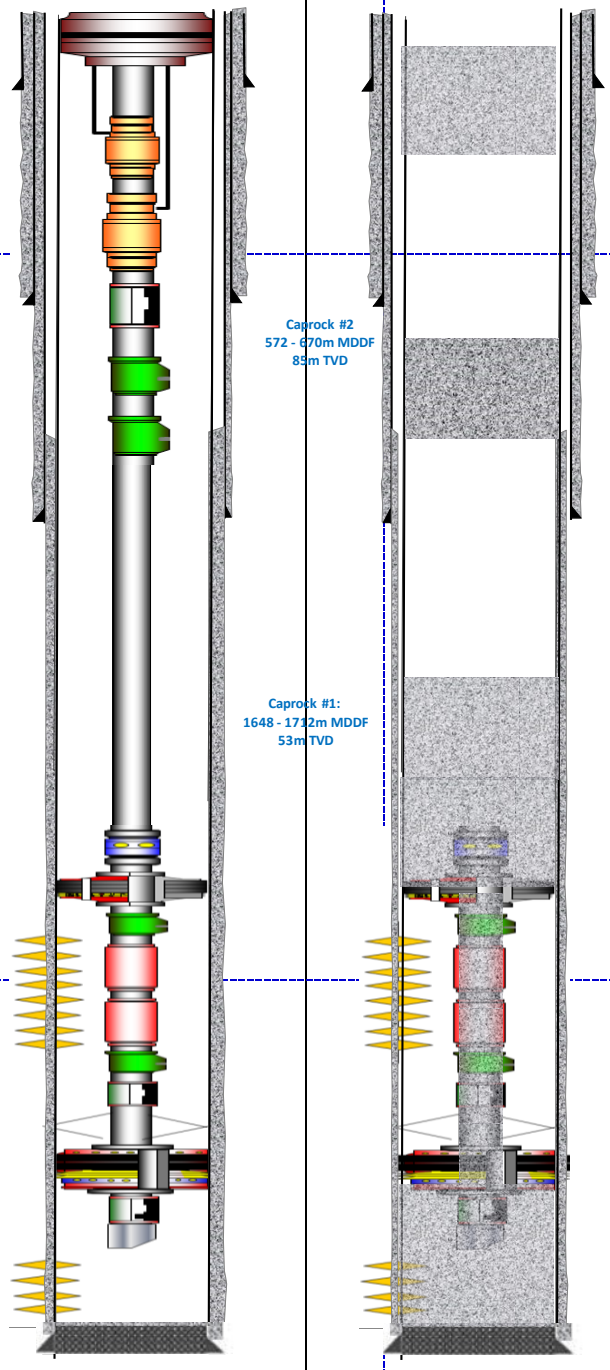
FIELD/PLATORM :	TIONG B
SLOT :	11
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2233
MAX ANGLE :	47
XMT/WH :	Single 3-1/8" WKM

CURRENT VS PLAN TIONG B-11

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			173	
16"	75	BTC			542.5	
10-3/4"	40.5	BTC			974.8	
7"	23	BTC			2232.7	
3.5"	9.3	EUE			2029.1	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	865	

EXISTING	PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
		SURFACE	TOC (10-3/4")	
		865.00	TOC (7")	
		115 -175	Surface Plug	1.42 - 6.00
		173.00	24" Conductor Shoe	
		260-278	Flow Point	
		499.00	Possible Shallow Gas	
		542.50	16" Conductor	
	Caprock #2 572 - 670m MDDF 85m TVD	630 - 634	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #3	30.26 - 38.50
		865.00	ESTIATED TOC (7") - NO RETURN	
		974.80	10-3/4" Casing Shoe TOC (Surface)	
	Caprock #1: 1648 - 1732m MDDF 53m TVD	1581 - 1731	AWCA / SECTION MILL & CEMENT PLUG # 2	36.00 - 31.50
		1731 - 2203	Cement Plug #1	42.75 - 45.75
		1,741.00	Tubing Cut	
		1,746.00	Close SSD	
		1,750.00	RH PACKER	
		1775 - 1844.5	PERF (I-100 / I-120)	
		2,024.00	LOCATOR WB PACKER (PERMANENT)	
		2,029.00	EOT	
		2148 - 2156	PERF (J20)	
		2,203.00	PBTD	
		2,232.70	7' Casing Shoe	



CURRENT VS PLAN TIONG B-12

FIELD/PLATORM :	TIONG B
SLOT :	5
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2217.9
MAX ANGLE :	41.25
XMT/WH :	Single 3-1/8" WKM

CASING/TUBING	WT (ppf)	THREAD	DEPTH	MIN ID
24"	186	Weld	173	
16"	75	BTC	542.5	
13-3/8"	54.5	BTC	890	
9-5/8"	**47**	**BTC**	**2024**	
3.5"	9.3	EUE	1769	

CEMENT RECORD	TYPE	TOC	TREAT' P (psi)
16" Casing	Class G	Surface	
13-3/8"	Class G	Surface	
9-5/8"	Class G	No Return	

EXISTING	PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
		SURFACE	TOC (13-3/8")	
		No Return	TOC (9-5/8")	
		115 -175	Surface Plug	1.50 - 2.90
24"		173.00	24" Conductor Shoe	
		492.00	Possible Shallow Gas	
16"		542.50	16" Conductor	
Caprock #3: 591 - 686m MDDF 150m TVD		650 - 700	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #3	0.75 - 0.50
13-3/8"		890.00	13-3/8" Casing Shoe TOC (Surface)	
Caprock #2: 1229 - 1254m MDDF 25.1m TVD		TBC	Flow Point	
Caprock #1: 1323 - 1347m MDDF 25.1m TVD		1217 - 1367	AWCA / SECTION MILL & CEMENT PLUG # 2	30.75 - 30.00
		1470 - 1759	Cement Plug #1	27.75 - 36.75
		1,480.00	Tubing Cut	
		1,498.80	Retrievable Hydraulic Packer	
		1530 - 1546	PERF (I110)	
		1566.80	Retrievable Hydraulic Packer	
		1597.5 - 1613.5	PERF (I120)	
		1,773.80	BWB Packer	
		1,779.80	LOCATOR WB PACKER (PERMANENT)	
		1,783.80	EOT	
		1933 - 1942	PERF (J20)	
		2,009.00	PBTD	
9-5/8"		2,024.00	9-5/8" Casing Shoe	

CURRENT VS PLAN TIONG B-13

FIELD/PLATORM :	TIONG B
SLOT :	1
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2255
MAX ANGLE :	43.5
XMT/WH :	Single 3-1/8" WKM

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			173	
16"	75	BTC			597.1	
10-3/4"	40.5	BTC			1048.5	
7"	23	BTC			2254.9	
3.5"	9.3	EUE			2106.2	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	No Return	

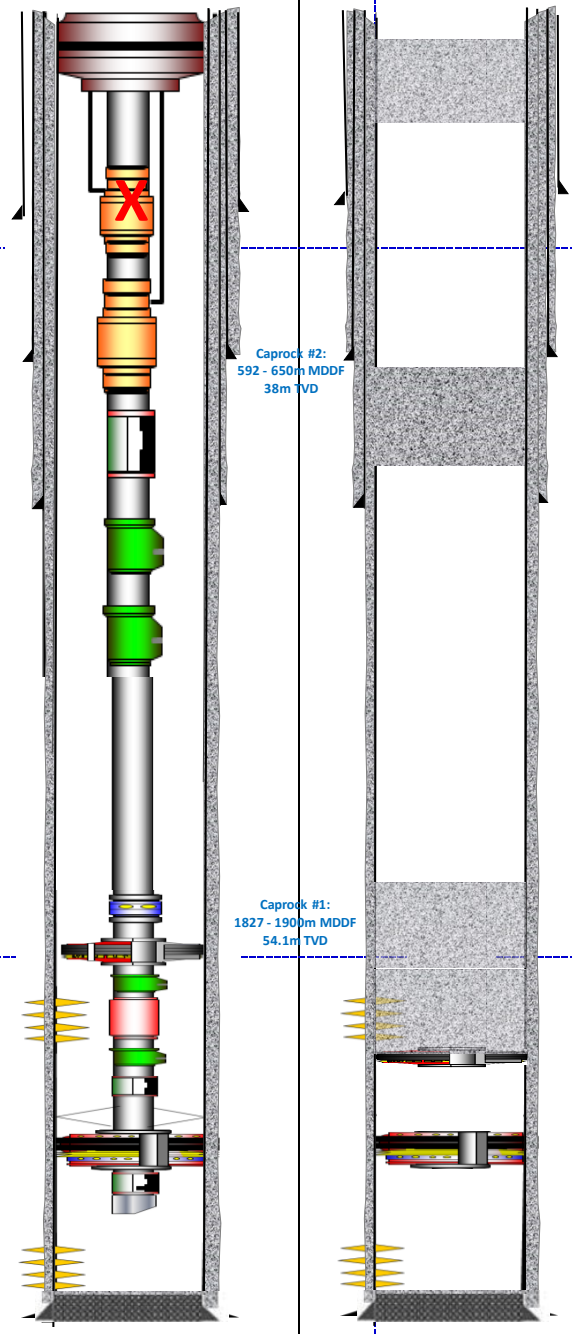
EXISTING	PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
		SURFACE	TOC (10-3/4")	
		No Return	TOC (7")	
		115 -175	Surface Plug	2.42 - 10.25
		173.00	24" Conductor Shoe	
			Possible Shallow Gas	
		597.10	16" Conductor	
Caprock #2: 659 - 730m MDDR 52m TVD		700 - 850	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #2	43.00 - 42.00
		1,048.50	10-3/4" Casing Shoe TOC (Surface)	
		565 - 877	Flow Point	
Caprock #1: 1674 - 1736m MDDF 54m TVD		1605 - 1755	AWCA / SECTION MILL & CEMENT PLUG # 1	36.25 - 28.75
		1,905.00	Tubing Cut	
		2,054.00	Close SSD	
		2,059.00	Option 1 (Nippleless Plug)	
		2,060.00	Retrievable Hydraulic Packer	
		2,067.00	Option 2 (X Plug)	
		2,101.00	LOCATOR WB PACKER (PERMANENT)	
		2,102.00	Option 3 (XN Plug)	
		2,106.20	EOT	
		2163 - 2181	PERF (J20)	
		2,229.00	PBTD	
		2,254.90	7' Casing Shoe	

FIELD/PLATORM :	TIONG B
SLOT :	6
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2562
MAX ANGLE :	50
XMT/WH :	Single 3-1/8" WKM

CURRENT VS PLAN TIONG B-14

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			606.9	
10-3/4"	40.5	BTC			1106.4	
7"	23	BTC			2525.9	
3.5"	9.3	EUE			2252.2	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	Surface	



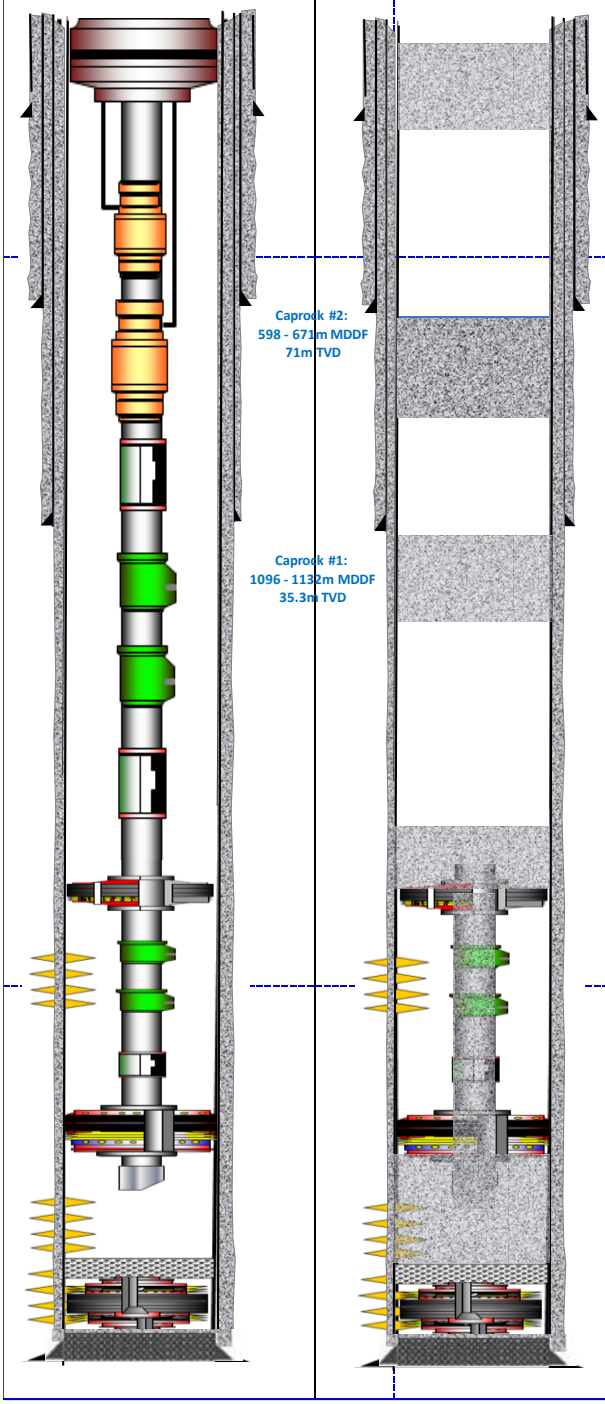
EXISTING / PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
	Surface	TOC (10-3/4")	
	Surface	TOC (7")	
	115 -175	Surface Plug	0.75 - 11.25
	131.00	FISH (TUBING STOP)	
	171.00	24" Conductor Shoe	
	606.90	16" Conductor	
	630 - 780	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #3	49.75 - 48.75
	539.00	Possible Shallow Gas	
	1,106.40	10-3/4" Casing Shoe TOC (Surface)	
	TBA	Flow Point	
	1770 - 1920	AWCA / SECTION MILL & CEMENT PLUG # 2	41.25 - 41.75
	1,909.50	Retrievable Hydraulic Packer	
	1920 - 1969	Isolation Plug # 1 (49 m)	41.75 - 41.25
	1945 - 1948.5	PERF (I110)	
	1,969.00	Bridge Plug	
	2,247.50	LOCATOR WB PACKER (PERMANENT)	
	2,525.90	EOT	
	2380 - 2390	PERF (J20)	
	2380 - 2390	PERF (J20)	
	2,500.00	PBTD	
	2,525.90	7' Casing Shoe	

FIELD/PLATORM :	TIONG B
SLOT :	15
RIG :	TIOMAN T-1
COMPLETION DATE :	1984
WATER DEPTH :	67
DFE :	30.8
THF :	14.8
TD :	2000
MAX ANGLE :	27
XMT/WH :	Single 3-1/8" WKM

CURRENT VS PLAN TIONG B-15

CASING/TUBING	WT (ppf)	THREAD	NO JOINT	LENGTH	DEPTH	MIN ID
24"	186	Weld			171	
16"	75	BTC			535	
10-3/4"	40.5	BTC			891	
7"	23	BTC			1940	
3.5"	9.3	TKC4040			1862	

CEMENT RECORD	TYPE	WEIGHT (ppg)	TOC	TREAT' P (psi)
16" Casing	Class G	15.9	Surface	
10-3/4" Casing	Class G	15.9	Surface	
7" Casing	Class G	15.9	Surface	



EXISTING / PLAN	DEPTH m-MDDF	DESCRIPTION	Deg ◦
	Surface	TOC (10-3/4")	
	Surface	TOC (7")	
	115 -175	Surface Plug	9.00 - 10.00
	171.00	24" Conductor Shoe	
	495.00	Possible Shallow Gas	
	535.00	16" Conductor	
	650 - 654	AWCA / SECTION MILL & CEMENT PLUG / SECTION MILL BiSN & CEMENT PLUG #3	11.00 - 12.00
	TBC	Flow Point	
	891.00	10-3/4" Casing Shoe	
	1002 - 1152	AWCA / SECTION MILL & CEMENT PLUG # 2	14.50 - 17.00
	1763 - 1880	Cement Plug #1	24.00 - 27.25
	1,773.00	Tubing Cut	
	1,778.00	Retrievable Hydraulic Packer	
	1,785.00	Pull GLV (SPM # 3)	
	1,804.00	PERF (I100)	
	1,804.00	Pull GLV (SPM # 4)	
	1,859.50	LOCATOR WB PACKER (PERMANENT)	
	1,862.00	EOT	
	1865 - 1873	PERF (J21)	
	1,880.00	TOC	
	1886.1 - 1892.8	PERF (J20) / SPIRAL PLUG	
	1,914.00	PBTD	
	1,940.00	7' Casing Shoe	

OPERATION SUMMARY

Item	*Job Description*	*Remark*
A	Slickline Activity	1. Set plug at first packer area 2. Tubing Cut
B	Bullheading Operation	3. Perform Injectivity test for potential donor well 4. Perform pressure test plug 5. Perform pumping through Annular casing (Reverse circulation) if required.

PRESSURE CALCULATION

MASTP CALCULATION

Well	TVD, ft	Fluid, ppg	Hydrostatic Pressure, psi	Fracture Gradient	Fracture Pressure	STP, psi	MSTP, psi
B-1	5,758	8.4	2,515	0.7	4,031	1,516	1,212
B-2	5,879	8.4	2,568	0.7	4,116	1,547	1,238
B-3	5,676	8.4	2,479	0.7	3,973	1,494	1,195
B-4	4,940	8.4	2,158	0.7	3,458	1,300	1,040
B-5	5,889	8.4	2,573	0.7	4,122	1,549	1,240
B-6	5,800	8.4	2,533	0.7	4,060	1,527	1,222
B-7	5,679	8.4	2,481	0.7	3,976	1,494	1,195
B-8	5,843	8.4	2,552	0.7	4,090	1,538	1,230
B-9	5,532	8.4	2,416	0.7	3,872	1,456	1,165
B-10	5,930	8.4	2,590	0.7	4,151	1,561	1,248
B-11	5,905	8.4	2,579	0.7	4,134	1,555	1,244
B-12	5,905	8.4	2,579	0.7	4,134	1,555	1,244
B-13	5,939	8.4	2,594	0.7	4,157	1,563	1,250
B-14	5,939	8.4	2,594	0.7	4,157	1,563	1,250
B-15	5,811	8.4	2,538	0.7	4,067	1,529	1,224

TREATMENT VOLUME

Description	Detail
Tubing Specification	3-1/2” 9.2ppf#
Prod. Casing Specification	7”, 23ppf#

Tubing Volume and A-Annulus Volume (for circulation)

Volume																
Type	External Pipe			Internal Pipe 1			Internal Pipe 2			Caps	From	To	From	To	Length	Total Volume (bbls)
	OD (inch)	ID (inch)	W(lb/ft)	OD (inch)	ID (inch)	W(lb/ft)	OD (inch)	ID (inch)	W(lb/ft)	Barrel/lin (ft)	m	m	ft	ft	ft	
B-01																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	2,061	0	6,762	6,762	**58.80**
PCP volume	7	6.366		3 1/2						0.02747	0	2,061	0	6,762	6,762	**185.74**
1.5 Total Volume																**366.81**
B-02																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	2,318	0	7,605	7,605	**66.14**
PCP volume	7	6.366		3 1/2						0.02747	0	2,318	0	7,605	7,605	**208.90**
1.5 Total Volume																**412.55**
B-03																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	2,400	0	7,874	7,874	**68.48**
PCP volume	7	6.366		3 1/2						0.02747	0	2,400	0	7,874	7,874	**216.29**
1.5 Total Volume																**427.15**
B-04																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	1,890	0	6,201	6,201	**53.92**
PCP volume	7	6.366		3 1/2						0.02747	0	1,890	0	6,201	6,201	**170.33**
1.5 Total Volume																**336.38**
B-05																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	1,903	0	6,244	6,244	**54.30**
PCP volume	7	6.366		3 1/2						0.02747	0	1,903	0	6,244	6,244	**171.50**
1.5 Total Volume																**338.69**
B-06																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	2,109	0	6,920	6,920	**60.17**
PCP volume	7	6.366		3 1/2						0.02747	0	2,109	0	6,920	6,920	**190.06**
1.5 Total Volume																**375.35**
B-07																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	2,525	0	8,285	8,285	**72.04**
PCP volume	7	6.366		3 1/2						0.02747	0	2,525	0	8,285	8,285	**227.55**
1.5 Total Volume																**449.39**
B-08																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	1,909	0	6,263	6,263	**54.47**
PCP volume	7	6.366		3 1/2						0.02747	0	1,909	0	6,263	6,263	**172.04**
1.5 Total Volume																**339.76**
B-09																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	2,004	0	6,575	6,575	**57.18**
PCP volume	7	6.366		3 1/2						0.02747	0	2,004	0	6,575	6,575	**180.60**
1.5 Total Volume																**356.67**
B-10																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	2,323	0	7,622	7,622	**66.28**
PCP volume	7	6.366		3 1/2						0.02747	0	2,323	0	7,622	7,622	**209.35**
1.5 Total Volume																**413.44**
B-11																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	1,750	0	5,742	5,742	**49.93**
PCP volume	7	6.366		3 1/2						0.02747	0	1,750	0	5,742	5,742	**157.71**
1.5 Total Volume																**311.46**
B-12																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	1,499	0	4,918	4,918	**42.77**
PCP volume	7	6.366		3 1/2						0.02747	0	1,499	0	4,918	4,918	**135.09**
1.5 Total Volume																**266.79**
B-13																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	2,060	0	6,759	6,759	**58.78**
PCP volume	7	6.366		3 1/2						0.02747	0	2,060	0	6,759	6,759	**185.65**
1.5 Total Volume																**366.63**
B-14																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	1,909	0	6,263	6,263	**54.47**
PCP volume	7	6.366		3 1/2						0.02747	0	1,909	0	6,263	6,263	**172.04**
1.5 Total Volume																**339.76**
B-15																
Tubing volume until first packer / Plug	3 1/2	2.992								0.00870	0	1,778	0	5,834	5,834	**50.73**
PCP volume	7	6.366		3 1/2						0.02747	0	1,778	0	5,834	5,834	**160.23**
1.5 Total Volume																**316.44**

Tubing Volume and Annulus Volume (for injectivity test)

Volume																	
Type	External Pipe			Internal Pipe 1			Internal Pipe 2			Caps	From	To	From	To	Length	Total Volume (bbls)
	OD (inch)	ID (inch)	W(lb/ft)	OD (inch)	ID (inch)	W(lb/ft)	OD (inch)	ID (inch)	W(lb/ft)	Barrel/lin (ft)	m	m	ft	ft	ft	
B-01																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,070	0	6,792	6,792	**59.06**
Annulus volume	7	6.366		3 1/2						0.02747	2,067	2,210	6,782	7,251	469	**12.89**
1.5 Total Volume																**107.92**
B-02																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,358	0	7,737	7,737	**67.28**
Annulus volume	7	6.366		3 1/2						0.02747	2,318	2,428	7,605	7,966	361	**9.91**
1.5 Total Volume																**115.79**
B-03																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,404	0	7,888	7,888	**68.59**
Annulus volume	7	6.366		3 1/2						0.02747	2,400	2,613	7,874	8,573	699	**19.20**
1.5 Total Volume																**131.68**
B-04																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,215	0	7,267	7,267	**63.20**
Annulus volume	7	6.366		3 1/2						0.02747	2,212	2,230	7,258	7,317	59	**1.62**
1.5 Total Volume																**97.23**
B-05																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,211	0	7,254	7,254	**63.08**
Annulus volume	7	6.366		3 1/2						0.02747	2,211	2,364	7,254	7,756	502	**13.79**
1.5 Total Volume																**115.31**
B-06																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,135	0	7,005	7,005	**60.92**
Annulus volume	7	6.366		3 1/2						0.02747	2,131	2,307	6,992	7,569	577	**15.86**
1.5 Total Volume																**115.16**
B-07																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,529	0	8,298	8,298	**72.16**
Annulus volume	7	6.366		3 1/2						0.02747	2,520	2,650	8,268	8,695	427	**11.72**
1.5 Total Volume																**125.81**
B-08																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	1,914	0	6,280	6,280	**54.61**
Annulus volume	7	6.366		3 1/2						0.02747	1,909	2,056	6,263	6,746	482	**13.25**
1.5 Total Volume																**101.79**
B-09																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,334	0	7,658	7,658	**66.59**
Annulus volume	7	6.366		3 1/2						0.02747	2,330	2,483	7,645	8,147	502	**13.79**
1.5 Total Volume																**120.57**
B-10																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,334	0	7,658	7,658	**66.59**
Annulus volume	7	6.366		3 1/2						0.02747	2,323	2,445	7,622	8,022	400	**10.99**
1.5 Total Volume																**116.38**
B-11																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,029	0	6,657	6,657	**57.89**
Annulus volume	7	6.366		3 1/2						0.02747	2,024	2,203	6,641	7,228	587	**16.13**
1.5 Total Volume																**111.03**
B-12																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	1,783	0	5,850	5,850	**50.87**
Annulus volume	7	6.366		3 1/2						0.02747	1,779	2,009	5,837	6,592	755	**20.73**
1.5 Total Volume																**107.40**
B-13																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,106	0	6,910	6,910	**60.09**
Annulus volume	7	6.366		3 1/2						0.02747	2,101	2,229	6,893	7,313	420	**11.54**
1.5 Total Volume																**107.43**
B-14																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	2,450	0	8,038	8,038	**69.90**
Annulus volume	7	6.366		3 1/2						0.02747	2,247	2,500	7,372	8,203	830	**22.80**
1.5 Total Volume																**139.05**
B-15																
Tubing volume until EOT	3 1/2	2.992								0.00870	0	1,862	0	6,109	6,109	**53.13**
Annulus volume	7	6.366		3 1/2						0.02747	1,860	1,914	6,103	6,280	177	**4.87**
1.5 Total Volume																**86.99**

SAFETY OPERATIONAL PROCEDURES

Prior to commencement of the pumping operation, a pre-job meeting will be held. This should be attended by the following parties as a minimum:

OIM, WSS, Pumping Supervisor, Representatives of other service companies involved and others as necessary.

Safety meetings should be held at the start of every shift and risk assessments must be evaluated during this time. Tool box talks should be held immediately prior to the job execution.

Note: The safety meeting must be driven by DB Supervisor addressing the following topics as a minimum:

1. Muster point.
2. Take list of personnel on site (Head count)
3. All personnel should review and be familiar with escape routes and emergency procedures.
4. Describe the **job objective, fluids and volumes to be pumped, pressures expected** during the job, and others.
5. Review **Dimension Bid Operations Policy and Procedure Manual.**
   - 5.1. Ensure at all steps carried out during the operations comply with this Manual.
   - 5.2. Management of change MUST be applied any time there is a need to deviate from the steps contained this procedure.
   - 5.3. A document MUST be created describing each the step of the deviation. This document shall also include the deviation Risk Assessment and it MUST be approved and signed by PCSB – Head of Well Intervention and Dimension Bid Operations Manager.
6. Exercise stops work authority if unsafe condition occurs and assess situation with all team members, resume operation after mitigation plan is in place.
7. Personnel responsibilities throughout the job.
8. Spills, fire, blow out, unexpected well behaviour.
9. Emergency shower station and eye wash station location.
10. Trapped potential energy such as pressure or coiled tubing stiffness.
11. Prepare related Job Hazard Analysis (JHA) prior commencement of any work, get approval from Client Site Representative (CSR) and review it with all personnel involved as well as to review Risk Assessment.
12. Discuss the well H_2S, CO_2, Hg (Mercury) content (if applicable).
13. Adhere all **PCSB Zeto Rules** and other guidelines.
14. Take a physical count of inventory and make sure all required materials are available on site.
15. **Barricade** the work area and display the appropriate **warning sign**.
16. On chemical mixing and handling; all personnel involved shall hold **safety meeting** and review **Safety Data Sheet** (SDS).
    - 16.1. Personnel involve during chemical handling shall be briefed by DB Chemical Specialist onsite and extra precautions must be taken. All SDS must be available on site and reviewed prior chemical handling.
    - 16.2. All non-essential personnel shall stay away from mixing site.
    - 16.3. Use PPE including respirators, hard hats, eye protection and steel-toed boots.
    - 16.4. Verify if there is any **dead volume** in the mixing tanks and adjust volumes to account for non-usable volume in the blender / mix tank.
    - 16.5. Consider wind direction and note all trip hazards in the mix / pumping area.

16.6. Prior to mixing chemicals, clean and verify the tank/batch mixer and lines are free of any debris and or contaminants.

16.7. In case of spill; wash the place where any chemical has been spilt with available spill kit.

16.8. Take care to prevent leakage due to ejection from valves, fittings, flanges, or other joints flexible chemical hoses and pumps. Never repair the equipment during transfer into mixing tank/container.

17. Take reading of Shut in / Flowing Tubing Head Pressure (SI/F/THP), Casing Head Pressure (CHP) and fluid sample (if available) prior to operation.
18. Check gas lift condition and capability with Site Operation Representative (SOR).
19. Ensure fitness prior to perform duties assigned.
20. Ensure all barriers are in place and followed.

HEALTH, SAFETY & ENVIRONMENT

1. Evaluate possible risks to arise during the job execution.
2. Evaluate risk assessment. Report any abnormal or insecure condition on site, taking into account all the steps or procedures to follow. Discuss with PCSB HSE coordinator, the execution or suspension of the job.
3. Review SDS of each product that will be used. Verify that all personnel on location handling toxic or corrosive products have the proper PPE.
4. Review the contingency plan for spills.
5. Do not vent / release any hydrocarbons from the well to atmosphere.

Notes: - Prior to DB personnel walking on upper deck, DB Supervisor to inspect upper deck and ensure that the area it is in good condition (Gratings, Hatches, etc.)

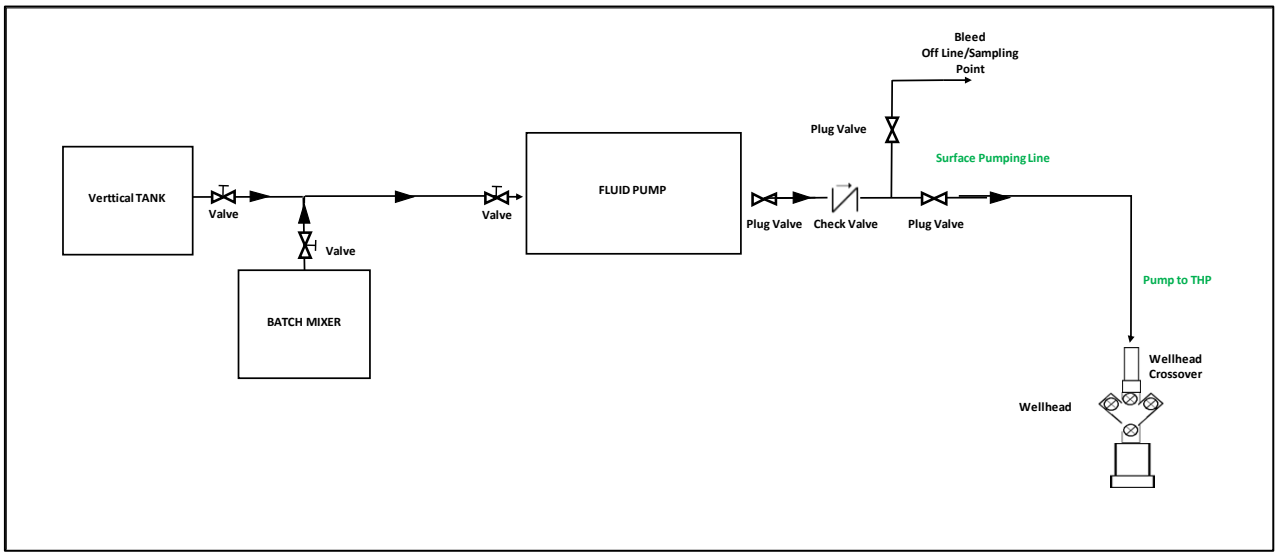
EQUIPMENT RIG-UP PROCEDURE

1. Hold a pre-job safety meeting. Discuss the rig up activities including the equipment lay out, lifting operations, crew roles and responsibilities and review the JHA as well.
2. Spot the equipment accordingly to space availability. Delegate only one personnel as the signalman and ensure every equipment has at least two tag line tied perpendicularly.
3. Rig up the LP hoses from fluid storage tanks to single pump unit.
4. Rig up 2" HP treating line as per DB Technical Standard from single pump to the Annular casing connection. Ensure a bleed off line is installed in the line and secure it firmly. (As per P&ID in appendix)
5. Check the THP and PCP, record it accordingly if any. Bleed off all pressure to as low as possible (if required).
6. Make up correct Annular Casing (production casing) crossover to the main treating line. (if required)

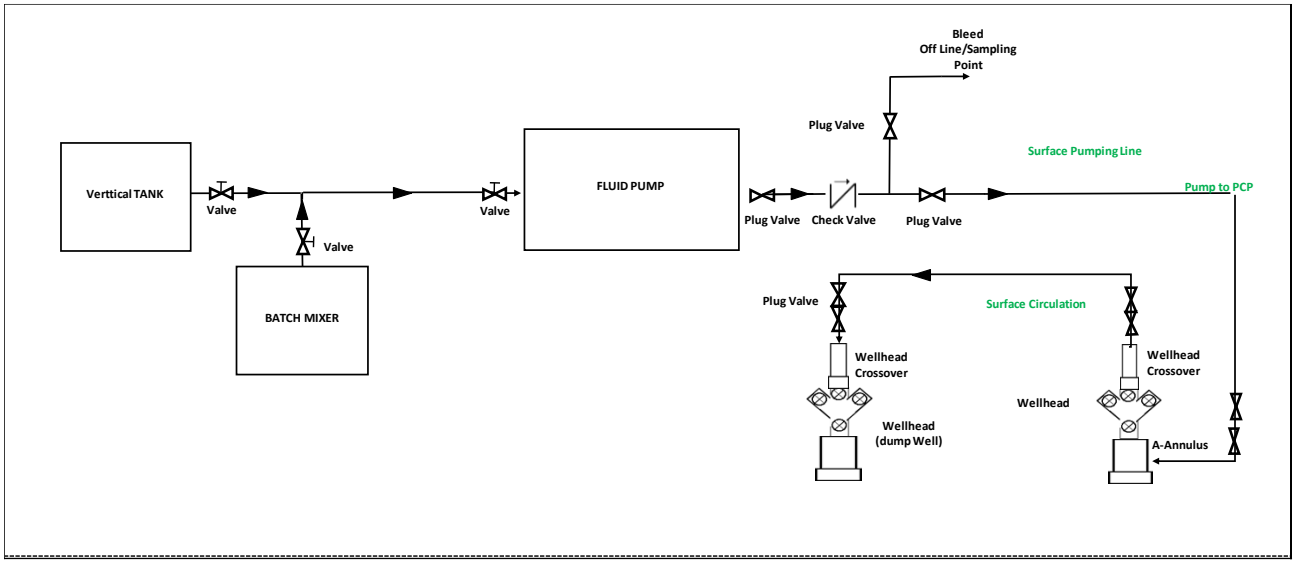
   *Job Supervisor to confirm with Client Representative on well handover status prior to rigging up on the wellhead.
7. Install a plug valve after the crossover then secure all line with safety cable.
9. Proceed to prepare for pressure test as per below.

PRESSURE TEST PROCEDURE

1. Job Supervisor to hold a pre-pressure testing safety meeting.
2. Prime the unit completely.
3. Start flush the treating lines with treated seawater.
4. Ensure the swab valve and master valve at the x-mas tree are closed.
5. Perform pressure test for the treating lines up to 500 psi and hold for 5 minutes. Inspect the lines for leaks and observe any pressure drop.
6. Increase pressure to 3000 psi and hold for 10 minutes. Inspect the lines for leaks and observe any pressure drop.
7. Once completed, bleed off pressure through the bleed off line by fully opening the master plug valve (2x1 plug valve) then slowly open the control valve (2x1 plug valve). Ensure pressure is bled to zero.



Bullheading setup for Injectivity test and pressure test plug



Bullheading setup for circulation (if required)

OPERATIONAL PROCEDURE

Conduct safety meeting with all personnel on location detailing the program, pressure limitations, personnel responsibilities, emergency well control drill, and safety precautions.

BULLHEADING PUMPING - INJECTIVITY

1. Ensure that treating line up to pump into the production tubing.
2. Manipulate surface valve to the following position prior pumping activity;

Description	Position
Flow Cross Pumping Valve (DB lines)	Open
Swab Valve	Open
Lower Master Valve	Open
Production Wing Valve	Close
A - Annular casing	Close

2.1. While opening up lower master valve, count turns for future reference.

3. Prior start pumping activity, complete the following:

3.1. Record shut in tubing head pressure (THP) and Annular casing pressure, Include in daily report.

Annular casing pressure (psi)	SITHP (psi)

3.2. Bleed off tubing and casing pressure to low as possible.

4. Open plug valve at the surface line that connects to pump-in tee and start pumping to flush 1.5 x Tubing and Annulus volume, if during pumping operation MASTP spike before complete 1.5 x Tubing volume. Stop pump and bleed off the pressure, wait for 10-15 minutes before re-attempt to pumping to complete pumping. Repeat for at least 3 Cycle. If after 3 Cycle unable to pump 1.5 volume, stop pump and proceed to next well.

   Notes: - for injectivity well candidate, consult with WSS/EIC at town.

Pumping Schedule for Injectivity Test								
WELL	Description	Fluid	Vol (bbl)	Vol (1.5) bbls	Pump Rates (BPM)	Remarks	MASTP (psi)	Remarks
B-01	**Flushing**	TSW	72	110	0.5 – 3.0	To flushing 1.5x Tubing Annulus Volume	1,212	
B-02	**Flushing**	TSW	78	116	0.5 – 3.0	To flushing 1.5x completion volume	1,238	
B-03	**Flushing**	TSW	88	132	0.5 – 3.0	To flushing 1.5x completion volume	1,195	
B-04	**Flushing**	TSW	65	98	0.5 – 3.0	To flushing 1.5x completion volume	**1,040**	

B-05	**Flushing**	TSW	77	116	0.5 – 3.0	To flushing 1.5x completion volume	1,240	
B-06	**Flushing**	TSW	77	116	0.5 – 3.0	To flushing 1.5x completion volume	1,222	
B-07	**Flushing**	TSW	84	126	0.5 – 3.0	To flushing 1.5x completion volume	1,195	
B-08	**Flushing**	TSW	68	102	0.5 – 3.0	To flushing 1.5x completion volume	1,230	
B-09	**Flushing**	TSW	81	121	0.5 – 3.0	To flushing 1.5x completion volume	1,165	
B-10	**Flushing**	TSW	78	117	0.5 – 3.0	To flushing 1.5x completion volume	**1.248**	
B-11	**Flushing**	TSW	75	112	0.5 – 3.0	To flushing 1.5x completion volume	1,244	
B-12	**Flushing**	TSW	72	108	0.5 – 3.0	To flushing 1.5x completion volume	1,244	
B-13	**Flushing**	TSW	72	108	0.5 – 3.0	To flushing 1.5x completion volume	1,250	
B-14	**Flushing**	TSW	93	140	0.5 – 3.0	To flushing 1.5x completion volume	1,250	
B-15	**Flushing**	TSW	58	87	0.5 – 3.0	To flushing 1.5x completion volume	**1,224**	

Well	TVD, ft	Fluid, ppg	Hydrostatic Pressure, psi	Fracture Gradient	Fracture Pressure	STP, psi	MSTP, psi
B-1	5,758	8.4	2,515	0.7	4,031	1,516	1,212
B-2	5,879	8.4	2,568	0.7	4,116	1,547	1,238
B-3	5,676	8.4	2,479	0.7	3,973	1,494	1,195
B-4	4,940	8.4	2,158	0.7	3,458	1,300	1,040
B-5	5,889	8.4	2,573	0.7	4,122	1,549	1,240
B-6	5,800	8.4	2,533	0.7	4,060	1,527	1,222
B-7	5,679	8.4	2,481	0.7	3,976	1,494	1,195
B-8	5,843	8.4	2,552	0.7	4,090	1,538	1,230
B-9	5,532	8.4	2,416	0.7	3,872	1,456	1,165

B-10	5,930	8.4	2,590	0.7	4,151	1,561	1,248
B-11	5,905	8.4	2,579	0.7	4,134	1,555	1,244
B-12	5,905	8.4	2,579	0.7	4,134	1,555	1,244
B-13	5,939	8.4	2,594	0.7	4,157	1,563	1,250
B-14	5,939	8.4	2,594	0.7	4,157	1,563	1,250
B-15	5,811	8.4	2,538	0.7	4,067	1,529	1,224

5. After complete fill up 1.5 tubing volume, proceed to perform injectivity test from 0.5 bpm – 3.0 bpm, sustain each rate for at least 10 minutes each rate.
6. Once complete injectivity test, proceed to next well.
7. In the event unable to complete injectivity test, report to town and proceed to next well.

SLICKLINE OPERATION & PRE-PREPARATION PRIOR FOR ANNULUS PUMPING

8. Pumping supervisor to witness the following slickline intervention and record it in treatment and daily report.
9. Slickline to conduct TCC run to ensure the tubing path is clear from obstruction prior to installation of plug at first packer area.
10. Record any fluid level or any HUD encountered.

Description	Depth
Fluid level	
HUD	

11. Once slickline completed, proceed to assist slickline to pump and fill up tubing prior for tubing integrity test (TIT).
12. Perform Positive pressure test to ensure that the plug is holding.
13. Prepare treated sea water as per below for pumping activity;

Treated Sea Water (TSW)				**100**	***BBL***	***Description***
Seq.	***Product***	***Concentration***		***Volume***		
1	Sea Water	992	gptg	4,166	gal	Base Fluid
2	ACM H2S Clear 200	2	gptg	8	gal	CO2 & H2S Corrosion Inhibitor
3	ACM BACT 200	2	gptg	8	gal	Micro Biocide Control
4	ACM OXYFREE 100	2	gptg	8	gal	Oxygen Scavenger

Mixing Instruction:

1. Prepare Sea Water into the mixing tank.
2. Add ACM H2S Clear 200 into the tank and circulate the mixture.
3. Add ACM BACT 200 & ACM OXYFREE 100 into the tank and circulate the mixture until homogenous.

Note: The above recipe is for 100bbls of TSW. Please prepare another batch of Treated Sea Water once needed.

14. Manipulate Surface valve to the following position prior pumping activity;

Description	Position
Flow Cross Pumping Valve (DB lines)	Open
Swab Valve	Open
Lower Master Valve	Open
Production Wing Valve	Close

14.1. While opening up Lower master valve, count turns for future reference.

15. Prior start pumping activity, complete the following:

15.1. Record shut in tubing head pressure (SITHP) and Annular casing pressure. Include in daily report.

Annular Casing Pressure (psi)	SITHP (psi)

15.2. Bleed off tubing and casing pressure to minimum as possible.

16. Open plug valve at the surface line that connects to pump-in tee and start pumping. Fill up completion tubing followed with pressure test.

16.1. Pressure test 500 psi and wait for 30 minutes.

16.2. If pressure holding good proceed to step 17, if not good wait for town decision (to re-set plug if required)

17. Once confirm the plug is holding, handover to slickline to enter next well.

ANNULUS PUMPING LUBRICATION (IF REQUIRED)

18. If required to proceed for circulate the fluid after tubing cut, proceed as per below.
19. Ensure that treating line up to pump into the production tubing through A-Annulus.
20. Manipulate surface valve to the following position prior pumping activity;

Description	Position
Flow Cross Pumping Valve (DB lines)	Open
Swab Valve	Open
Lower Master Valve	Open
Production Wing Valve	Close
A - Annular casing	Open

20.1. While opening up lower master valve, count turns for future reference.

21. Prior start pumping activity, complete the following:

21.1. Record shut in tubing head pressure (THP) and Annular casing pressure, Include in daily report.

Annular casing pressure (psi)	SITHP (psi)

21.2. Bleed off tubing and casing pressure to low as possible.

22. Open plug valve at the surface line that connects to pump-in tee and start pumping to flush 1.5 x annular volume casing vs completion tubing, if after 1.5x. volume still got trace of hydrocarbon on surface, continue to flush until clean return.

Pumping Schedule for Injectivity Test								
WELL	Description	Fluid	Vol (bbl)	Vol (1.5) bbls	Pump Rates (BPM)	Remarks	MASTP (psi)	A-Annulus Volume above first packer, bbl.
B-01	**Flushing**	TSW	244	367	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**186**
B-02	**Flushing**	TSW	275	413	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**209**
B-03	**Flushing**	TSW	285	427	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**217**
B-04	**Flushing**	TSW	224	336	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**170**
B-05	**Flushing**	TSW	226	339	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**172**
B-06	**Flushing**	TSW	250	376	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**190**

B-07	**Flushing**	TSW	300	449	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**228**
B-08	**Flushing**	TSW	227	340	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**172**
B-09	**Flushing**	TSW	238	357	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**181**
B-10	**Flushing**	TSW	276	414	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**210**
B-11	**Flushing**	TSW	208	311	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**158**
B-12	**Flushing**	TSW	178	267	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**135**
B-13	**Flushing**	TSW	245	367	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**186**
B-14	**Flushing**	TSW	227	340	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**172**
B-15	**Flushing**	TSW	211	317	0.5 – 3.0	To flushing 1.5x completion volume	**3,000**	**160**

23. For the return fluid pressure, ensure the pressure does not exceed MASTP below: -

Well	TVD, ft	Fluid, ppg	Hydrostatic Pressure, psi	Fracture Gradient	Fracture Pressure	STP, psi	MSTP, psi
B-1	5,758	8.4	2,515	0.7	4,031	1,516	1,212
B-2	5,879	8.4	2,568	0.7	4,116	1,547	1,238
B-3	5,676	8.4	2,479	0.7	3,973	1,494	1,195
B-4	4,940	8.4	2,158	0.7	3,458	1,300	1,040
B-5	5,889	8.4	2,573	0.7	4,122	1,549	1,240
B-6	5,800	8.4	2,533	0.7	4,060	1,527	1,222
B-7	5,679	8.4	2,481	0.7	3,976	1,494	1,195
B-8	5,843	8.4	2,552	0.7	4,090	1,538	1,230
B-9	5,532	8.4	2,416	0.7	3,872	1,456	1,165
B-10	5,930	8.4	2,590	0.7	4,151	1,561	1,248

B-11	5,905	8.4	2,579	0.7	4,134	1,555	1,244
B-12	5,905	8.4	2,579	0.7	4,134	1,555	1,244
B-13	5,939	8.4	2,594	0.7	4,157	1,563	1,250
B-14	5,939	8.4	2,594	0.7	4,157	1,563	1,250
B-15	5,811	8.4	2,538	0.7	4,067	1,529	1,224

24. After complete flushing, handover the well to the production/slickline for next activity.

SURFACE PUMPING LINE RIG-DOWN PROCEDURE

25. Conduct safety meeting with all relevant personnel and discuss the following but not limited to trapped pressure, heavy lift, simultaneous activities, standard rig down procedures.

26. Rig down surface treating lines as per following guidelines:

    26.1. Ensure that all wellhead valves are closed.

    26.2. Ensure that all surface lines are flushed with fresh or sea water.

    26.3. Bleed off pressure in all surface lines to zero (0) psi

        26.3.1. Verify that there is no pressure trapped between valves

        26.3.2. It is recommended to have all valves in surface line opened to atmosphere prior to breaking up connections.

    26.4. Remove restrain wire from surface lines.

    26.5. Proceed to break connection with hammer in good condition.

    26.6. Rig down pumping-tee, riser / lubricator and cross-over.

    26.7. Properly place the surface treating lines in the iron baske