

**PRUITT OPTIMAL CASE STUDY**

# MPD Cementing or MPC: Cementing Solution for Problem Formations.

*‘Managed Pressure Cementing’ or ‘MPC’ is a cementing solution for narrow and ultra narrow pressure windows that cannot be cemented using conventional methods. MPC is a variation of Managed Pressure Drilling (MPD) technology and works on the same principles as MPD.*

*Pruitt has successfully planned and executed multiple MPC projects. Several of these formations had very low fracture gradients, low formation leak-off limits, severe loss of circulation challenges, and/or were highly fractured and faulted. These wells were cemented with minimal losses by managing the Surface Backpressure (SBP) in static and dynamic conditions, similar to a Constant Bottomhole Pressure (CBHP) MPD operation, and there by controlling the wellbore pressures throughout the cementing operation as fluids of different compositions, properties and densities were circulated at different rates.*

**Challenge/Problem:** Cementing pipe in formations that have narrow/ultra narrow pressure windows and challenges such as (a) severe loss of circulation, (b) low formation leak-off, (c) low formation strength, (d) highly faulted and fractured formations, (e) high pressure fluid flows, (f) formation stability issues, etc.

**Action/Solution:** Perform MPC by using Constant Bottomhole Pressure (CBHP) MPD principles to minimize losses and avoid formation fluid gains, and to place cement at desired depth(s).

**Execution/Results:** Pruitt Optimal has successfully planned and executed MPC on multiple projects (10+) in USA to cement pipe using static and dynamic Surface Backpressure.

*Pruitt MPD system with single/dual choke(s) and Coriolis meter was used to manage the surface pressures and minimize losses and eliminate gains in such Managed Pressure Cementing operations.*

**Details:** Different operators used Pruitt Optimal MPD services to perform Managed Pressure Cementing.

1. An operator in US cemented several wells on a multi well pad using MPC on their production openhole section. MPD was used for drilling the openhole on both intermediate and production sections on 8 wells, while MPC was used on 5 of these wells ( $\leq 0.5$  ppg pressure window).
2. Another operator in US had multiple wells with a very high permeability and communication across multiple formation layers in the production hole. The objective was to stay within a 0.5 ppg window while cementing entire production hole section using multiple density cementing fluids.

## Typical MPC Solution



DRILLING PARAMETERS							MUD PROPERTIES	
ROP	BHP	WHP	ECD	SPP	DENSITY	MODE	FLOW	F. TYF
10.894ft	0.0ft/min	6396psi	2psi	11.65ppg	8.4ppg			
10.5612ft	0	11.65ppg	1823psi		2bb/min			
FLUID ROLLOVER SCHEDULE								
FLOW	MW IN	MW OUT	WHP	ECD	EMW	VOLUME	ST	
0	9.4	9.4	295	9.94	9.94	0.0	0	
4	10.0	9.4	129	9.94	9.63	60.0	14	
4	10.0	9.4	129	9.94	9.63	60.0	14	
4	12.5	9.4	75	9.94	9.66	180.0	45	
4	12.5	9.4	66	9.94	9.66	182.9	44	
4	13.5	9.4	0	10.53	10.25	133.1	33	
4	13.5	9.4	0	10.55	10.28	137.8	35	
4	8.33	9.4	0	10.59	10.31	7.3	2	
4	8.33	9.4	0	10.6	10.33	10.0	2	
4	8.4	9.4	0	11.58	11.24	137.3	35	
4	8.4	9.4	0	11.58	11.24	137.3	35	
2	8.4	9.4	2	11.65	11.39	20.5	5	

## Typical Pressure Schedule