

MICROPLUG™		 HYDRASHOCK™
MicroPlug™ Case History		Pipe Recovery
Document Number	Approver Position	TENAX Energy Solutions BDM
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Days stuck in well: 2 milling operations, they were unable to move up or
Location: Weld / CO down. Prior to getting a TENAX technician on
Stuck Depth: 9,595' location, the coiled tubing had been max pulled to
TVD @ Stuck Depth: 7,024' 35,000lbs.

Scope of Work:

Free coiled tubing stuck during a millout.

Treatment:

The TENAX technician arrived on location at 2:50am on 5/29/17. To begin, fluid was injected down the annulus until a consistent circulating pressure was achieved. The baseline rate of 7bbls/min was maintained at 2,700psi. Once this control was established, the initial 10 MicroPlugs were dropped (50bbls total fluid pumped), and the weight was set down to 10,000lbs below the last known down-running weight. Next, 1 "Red" ΔnBall and 14 "Black" ΔnBalls were dropped into the HydraShock Run-in-place tool with the coiled tubing in compression 10,000lbs below running weight. One "Yellow" ΔnBall and 5 "White" ΔnBalls were pumped before a weight change was noted. After moving the string down 87ft, it was decided to switch back to running MicroPlugs to be able to apply pressure to the top of the fill and create more tubing movement. MicroPlug operations were then continued with 10 plugs per 25bbls fluid pumped. Next, the coiled tubing was pulled into tension 10,000lbs over the last known pulling weight to prepare for MicroPlug operations. After 150 more MicroPlugs were pumped down the annulus the injection pressure went down to 2,100psi and the coiled tubing began to move freely uphole. Only 1 more "White" ΔnBall was dropped into the HydraShock when the tubing was detained at 7,911ft. The ΔnBall extruded at 9,750psi and the coiled tubing was pulled free to surface, the BHA was changed out, and plug milling operations continued.

Background:

Workstring: 2.00" / 0.203" - 0.125" wall / QT1000
TENAX tools: 500 Series HydraShock / MicroPlug PR
Max Rate: 7bbls/min @ 2700psi

Perforation Information

Gun Info: 3.13" OD 1.5' guns w/60° phasing
Shots: 6spf / 21g charge
0.42" EHD / 38" Penetration
Perforations to BHA: 1680
Regimen: 10 plugs every 25bbls fluid
Completion Specifics:
➤ 4.5" 13.5lb P110
➤ 90° @ 7,779'
➤ PBSD @ 14,911'
➤ BHT - 203°
➤ BHP - 4303

SITP: 2485psi
SICP: 1165psi
Immediate Concerns: 21.7% fatigue spike at

9,745' | wellhead pressure started to fall off after going through plug #9

Initially, the operating company was milling out plugs after completing fracturing operations. Following plug #13/37 being milled up, the coiled tubing was picked up 300ft to bring debris above the previous set of perforations. When the coiled tubing tried to resume