



Do You Want
100% Success
Rate on
Pullbacks this
Season?



Items to Monitor

- Pullback Speed
- Mud Flow
- Axial Tensile
- Pullback Pressure



Mud Flow

Bore stays open, pumps are not overworked, and fluid circulation through the borehole is maintained



Pullback Speed

Ranges usually between 1 to 2 feet per minute



Axial Tension

The maximum outer fiber tensile stress should not exceed the safe pull stress (found in table on page 5)



Pullback Force

The pulling force which overcomes the combined frictional drag, capstan effort, and hydrokinetic drag, is applied to the pull-head and first joint of HDPE pipe. The axial tensile stress grows in intensity over the length of the pull. The DR (11) must be selected so that the tensile stress in the pipe wall due to the pullback force (787), does not exceed the permitted tensile stress for the pipe material. Increasing the pipe wall thickness will allow for a greater total pull-force.



Hydrokinetic Drag

During Pulling, pipe movement is resisted by the drag force of the drilling fluid. This hydrokinetic force is difficult to estimate and depends on the drilling slurry, slurry flow rate pipe pullback rate, and borehole and pipe size.

Typically, the hydrokinetic pressure is estimated to be in the 30 to 60 kPa (4 to 8 psi) range.

Formula

$$F_{HK} = p \frac{\pi}{8} (D_H^2 - OD^2)$$

WHERE
F_{HK} = hydrokinetic force, lbs
p = hydrokinetic pressure, psi
D_H = borehole diameter, in
OD = pipe outside diameter, in



Safe Pull Back Force					
Size	Nom. OD	9	11	13.5	17
1.25	1.660	940	787	653	527
1.5	1.900	1232	1030	855	690
2	2.375	1924	1610	1336	1079
3	3.500	4179	3497	2902	2343
4	4.500	6908	5780	4797	3872

Reference: <https://plasticpipe.org/pdf/chapter12.pdf>

