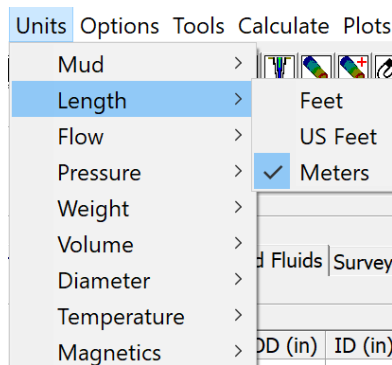


### Innova Engineering - Hydraulics – Riserless Example

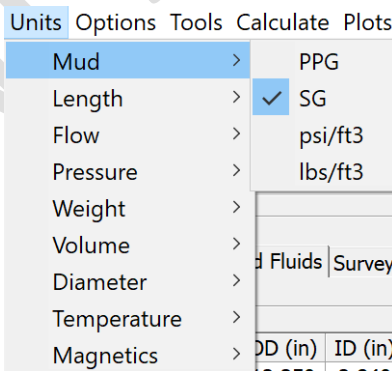
This tutorial demonstrates how to use Innova Engineering to generate hydraulics results for a deep-water hole section with returns to seabed.

This example project guide comes as part of the standard install and can be found in the following location: **C:\Program Files (x86)\Innova Drilling and Intervention\Innova Engineering\Manuals**

Create a new project and change the length units to meters from the unit menu:



Change the mud units to S.G.



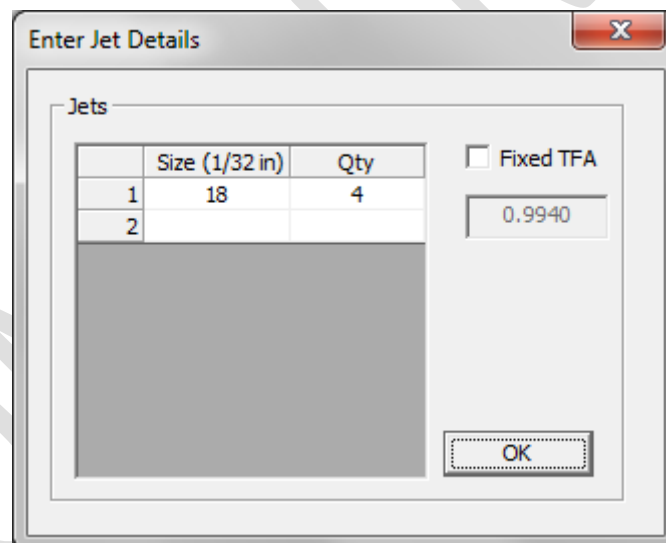
Enter the following Drill String

	Description	OD (in)	ID (in)	TJ OD (in)	TJ ID (in)	Weight (lb/ft)	Type	Length (m)	Total Length (m)	Non-Magnetic
1	26" Rock Bit	26.000	3.000			1779.92	Bit	0.500	0.50	<input type="checkbox"/>
2	BHA	9.500	3.000			216.82	Drill Collar	60.470	60.97	<input type="checkbox"/>
3	8 1/4" Drill Collar	8.250	2.813			160.51	Drill Collar	60.000	120.97	<input type="checkbox"/>
4	HWDP	5.500	3.250	6.250	3.500	54.86	Drill Pipe	85.000	205.97	<input type="checkbox"/>
5	5 1/2" Drill Pipe	5.500	4.776	6.250	5.500	20.32	Drill Pipe	2074.000	2279.97	<input type="checkbox"/>
6										<input type="checkbox"/>

Click on row 1 to bring up the properties of the PDC bit

Component Details	
SN	
Gauge OD (in)	
TFA (sq in)	
Connection Top	
Bit Formation Index (0-1)	
Bit Type	
Tensile Yield (klbs)	
Torsional Yield (kftlbs)	

Click on the cell for the bit TFA and click on the “...” button to bring up the bit jets dialog. Enter 4 x 18 jets or click the fixed TFA check box and enter 0.9940 and click the OK button.



Enter the well geometry

Well Geometry					
	Type	MD (m)	TVD (m)	ID (in)	OD (in)
1	Air Gap	25.00	25.000		
2	Open Water	2200.00	2200.000		
3	Open Hole	3200.00	3200.000	26.00	26.000
4					

Enter the fluid details

Fluid properties

Mud Weight (ppg)    
 PV    
 YP    
  
  
  
   
   
 Calculate N and K

Cuttings Details

Density (ppg)    
 Diameter (in)    
 Thickness (in)

Additional Fluids

	Vol (bbls)	Density (ppg)
1		

Enable

Select the engineering parameters tab and enter the following details in the hydraulics section.

Hydraulics

Hyd. Model  ROP  ECD Adj (ppg)   
 Surge/Swab  RPM  SW Den (ppg)   
 Surge/Swab Ref  Surface Pressure Loss (psi)   
 User defined  Calc Depth(m)

Flow Rates

	Flow Rate (gpm)
1	900.00
2	1000.00
3	1100.00
4	1200.00
5	

Manual flow increment

Tripping Speeds

	Tripping Speed (m/min)
1	15.00
2	22.50
3	30.00
4	37.50
5	45.00

Manual tripping increment

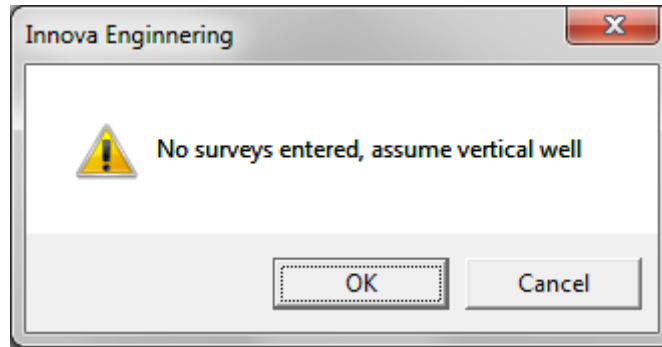
All parameters are now entered, and the calculation can now be run from the calculation menu or by pressing the calculate hydraulics button on the toolbar

- Calculate
- Plots
- Survey Correction
- Results
- Hydraulics**
- Torque and drag
- Wellpath magnetic interference
- BHA Analysis and SAG Correction
- Torque and Drag Snapshot
- BHA Sensitivity Analysis

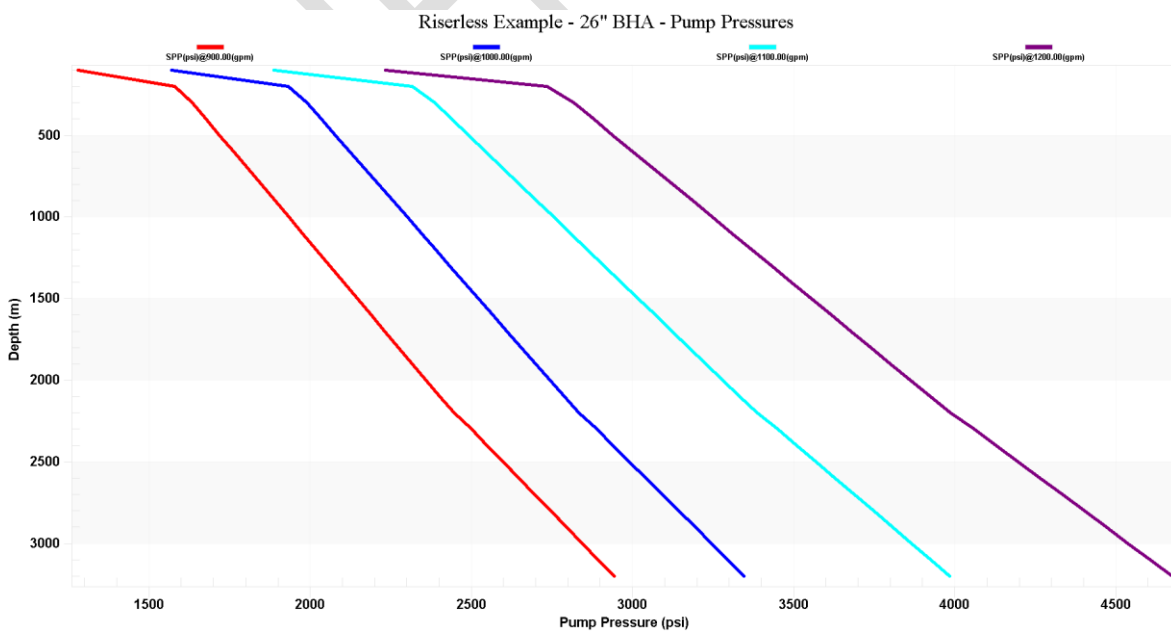
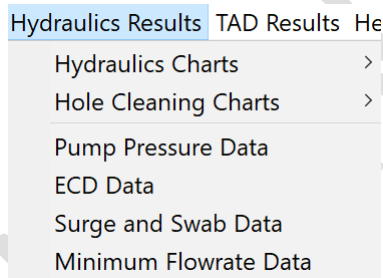


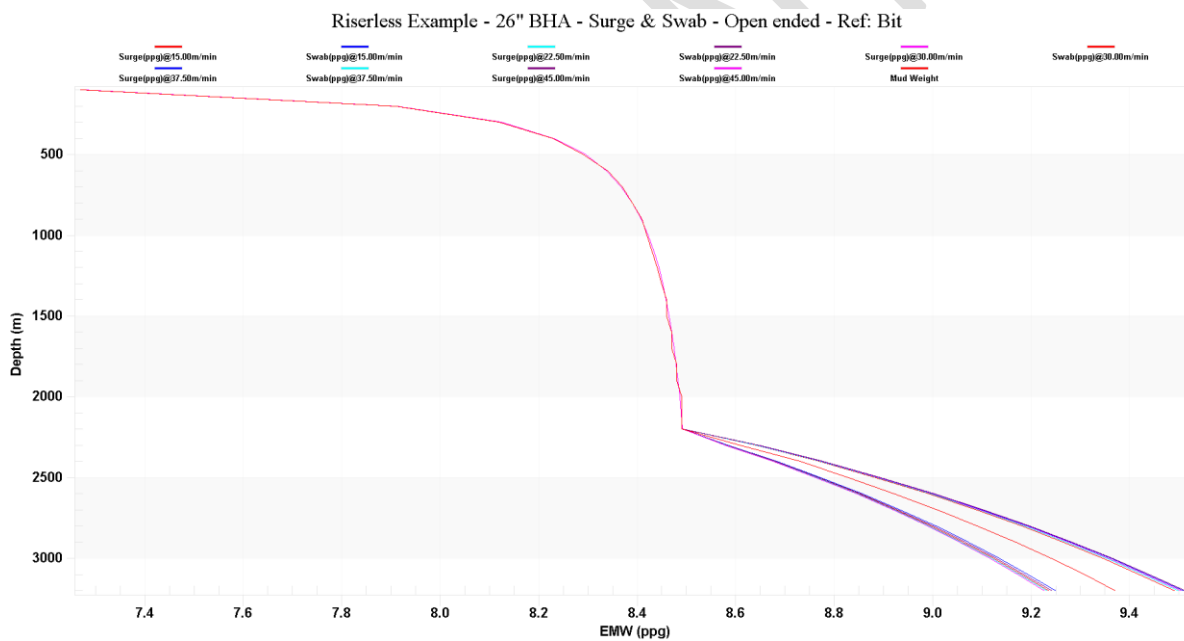
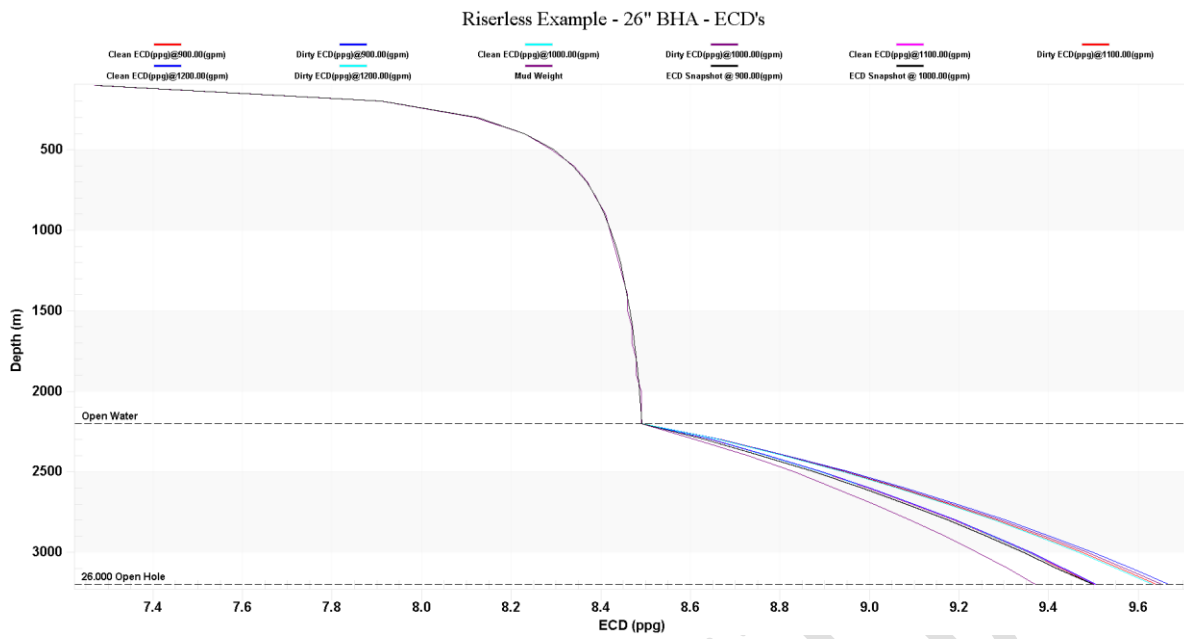
or

Calculate Hydraulics and the following warning will be displayed



Click OK to the warning and view the results. Charts and tabular data can be viewed from the "Hydraulics results" menu or the toolbar buttons





The ramp in pressure gradient can be seen due to there being no riser.

As a reference a completed Engineering Project file entitled **Riserless - Example Project.ieng** can be found in the following location: **C:\Program Files (x86)\Innova Drilling and Intervention\Innova Engineering\Example Projects.**