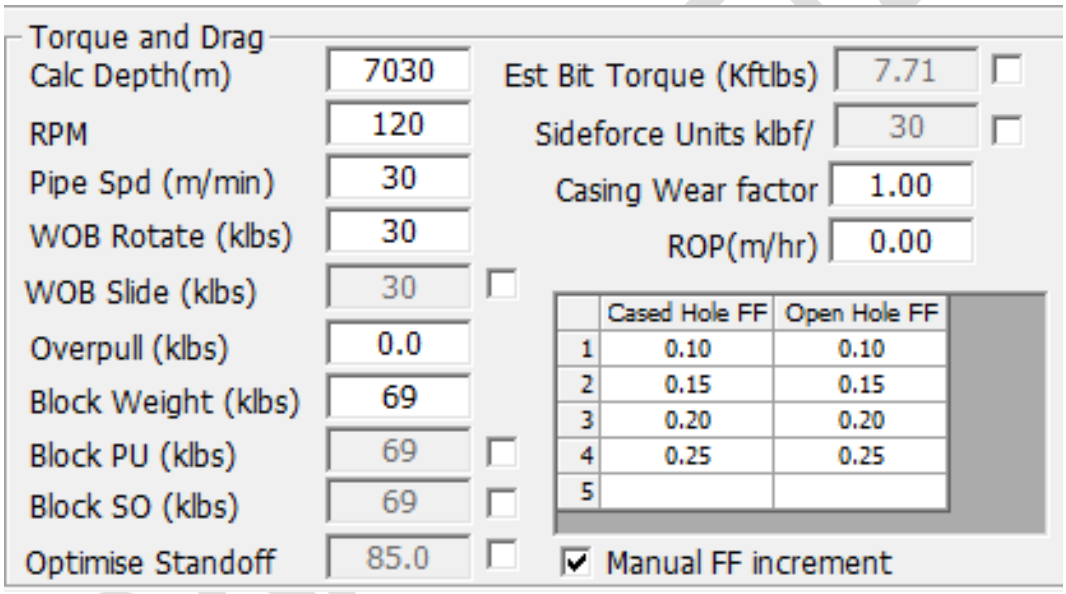
Innova Engineering - Torque and Drag Example

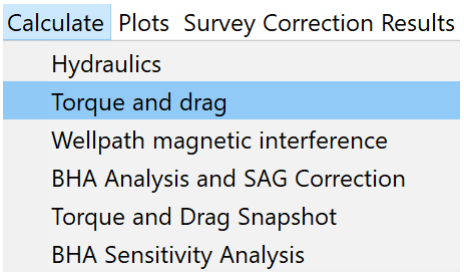
This tutorial demonstrates how to use Innova Engineering to calculate torque and drag results for an extended reach well.

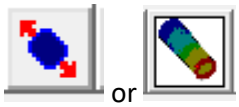
This example project guide comes as part of the standard install and can be found in the following location: **C:\Program Files (x86)\Innova Drilling and Intervention\Innova Engineering\Manuals**

Set up the project as per the **Hydraulics Example** located in **C:\Program Files (x86)\Innova Drilling and Intervention\Innova Engineering\Manuals**. Once completed click on the engineering parameters tab. Set up the torque and drag parameters as per the below screenshot.

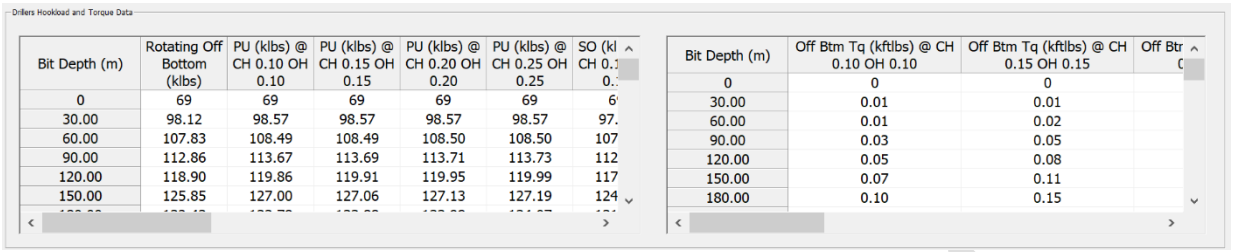


Click on the calculate torque and drag option from the menu or use the toolbar button.





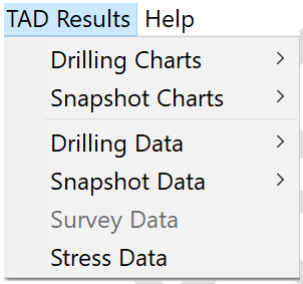
The torque and drag results will now be displayed in the torque and drag results grid.



Bit Depth (m)	Rotating Off Bottom (klbs)	PU (klbs) @ CH 0.10 OH 0.10	PU (klbs) @ CH 0.15 OH 0.15	PU (klbs) @ CH 0.20 OH 0.20	PU (klbs) @ CH 0.25 OH 0.25	SO (kl CH 0.1 0.
0	69	69	69	69	69	6
30.00	98.12	98.57	98.57	98.57	98.57	97.
60.00	107.83	108.49	108.49	108.50	108.50	107
90.00	112.86	113.67	113.69	113.71	113.73	112
120.00	118.90	119.86	119.91	119.95	119.99	117
150.00	125.85	127.00	127.06	127.13	127.19	124

Bit Depth (m)	Off Btm Tq (kftlbs) @ CH 0.10 OH 0.10	Off Btm Tq (kftlbs) @ CH 0.15 OH 0.15	Off Btr
0	0	0	
30.00	0.01	0.01	
60.00	0.01	0.02	
90.00	0.03	0.05	
120.00	0.05	0.08	
150.00	0.07	0.11	
180.00	0.10	0.15	

Charts and tabular data can be viewed from the “TAD Results” menu or the toolbar buttons.



If you wish to use friction reduction subs modify the drill string as follows.

	Description	OD (in)	ID (in)	TJ OD (in)	TJ ID (in)	Weight (lb/ft)	Component	Length (m)	Total Length (m)	Non-Magnetic
1	PDC Bit	12.250	2.840			240.000	Bit	0.350	0.35	☐
2	RSS	9.500	2.480			265.000	RSS	6.180	6.53	☐
3	Drilling Dynamics	9.500	2.840			329.000	MWD/LWD	2.240	8.77	☑
4	MWD	9.500	2.810			329.000	MWD/LWD	8.550	17.32	☑
5	Pulser	9.500	2.810			329.000	MWD/LWD	6.320	23.64	☑
6	LWD	8.250	2.813			240.000	MWD/LWD	10.930	34.57	☑
7	Flexi NMDC	8.250	2.875			150.000	MWD/LWD	17.220	51.79	☑
8	HWDP	6.625	4.000	8.000	4.000	80.000	Drill Pipe / HWDP	74.650	126.44	☐
9	Jar	8.000	3.000			110.000	Jar	11.340	137.78	☐
10	HWDP	6.625	4.000	8.000	4.000	80.000	Drill Pipe / HWDP	28.000	165.78	☐
11	Accelerator	8.000	3.000			110.000	Accelerator	11.780	177.56	☐
12	HWDP	6.625	4.000	8.000	4.000	80.000	Drill Pipe / HWDP	28.250	205.81	☐
13	Drill Pipe	5.731	5.153	6.563	4.250	27.060	Drill Pipe / HWDP	3000.000	3205.81	☐
14	Drill Pipe	5.731	5.153	6.563	4.250	27.060	Drill Pipe / HWDP	3000.000	6205.81	☐
15	Drill Pipe	5.731	5.153	6.563	4.250	27.060	Drill Pipe / HWDP	824.190	7030.00	☐
16										☐

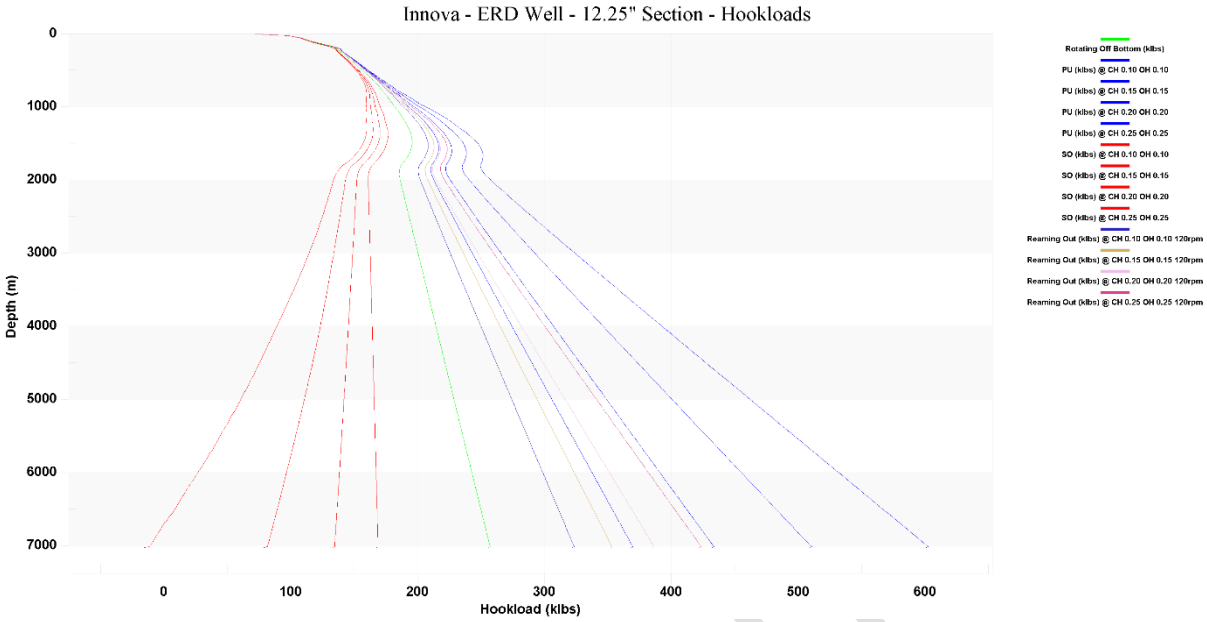
An extra two drill pipe sections have been added all the same size as the original drill pipe. Click on the pipe second from the bottom and set its friction reduction to 20%.

Component Details

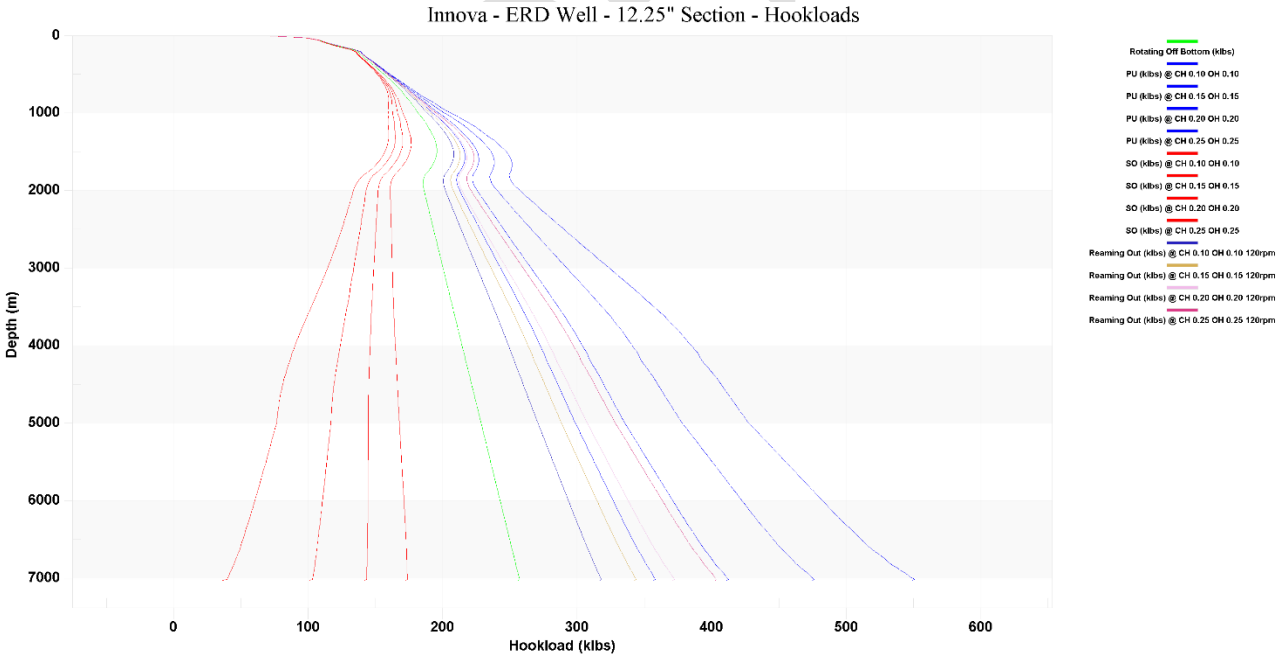
Connection Top	
Connection Bottom	
Friction Reduction Sub %	20.000

Re-run the calculation and look at the hookload chart.

Hookload chart without friction reduction subs.



Hookload chart with friction reduction subs.



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