ep.pengtools.com

Achieving potential

All your need to maximize your oil & gas production, quick

Case Study
Oil Flowing Material Balance

Mikhail Tuzovskiy, 11.04.2018
mtuzovskiy@pengtools.com

Summary

This Case Study demonstrates the application of the **Oil Flowing Material Balance (FMB)** engineering technique using the **E&P Portal**.

The Study is based on the oil well from a field in West Siberia, Russia.

It is shown how to:

- Input the data to the **E&P Portal**;
- Apply the **Oil FMB** to estimate the well's STOIIP and JD**;**
- Save and export the analysis results.

All the input data is attached to the Case Study for the reference.

Table of Contents

Introduction

E&P Portal is a service to identify production enhancement opportunities and maximize production and recovery. The average production increase for the last 3 E&P companies applied the **E&P Portal** was 38%.

Oil FMB is the advanced engineering technique published in 2005 by Louis Mattar and David Anderson. Original paper PDF: Dynamic Material Balance (Oil or Gas-In-Place Without Shut-Ins).

The details on math and physics of the **Oil FMB** method are published on the wiki page:

https://wiki.pengtools.com/index.php?title=Oil_Flowing_Material_Balance

Oil FMB is available at the **E&P Portal** as one of its engineering workflows. The access to the **Oil FMB** tool at the **E&P Portal** is free for the personal use, once sign up at ep.pengtools.com.

Well Data

Well “8” was drilled down to **9240** ft.

Well design: **13 3/8** in conductor down to **101** ft; **9 5/8** in surface casing down to **2699** ft; 7 in production casing down to **9240** ft.

The well “8” was perforated and hydraulically fractured in “B2” reservoir of the “Superior” field on 01.05.2017[1].

The “B2” reservoir was perforated as follows: top **MD 8850** ft, bot **MD 8897** ft, by “Mega-73 BG” gun with shot density of **6 SPF**.

Well completion string is **2 7/8** in down to **8102** ft with the ESP on **7905** ft.

From the log analysis report the well **kh** is 17.8 md*ft.

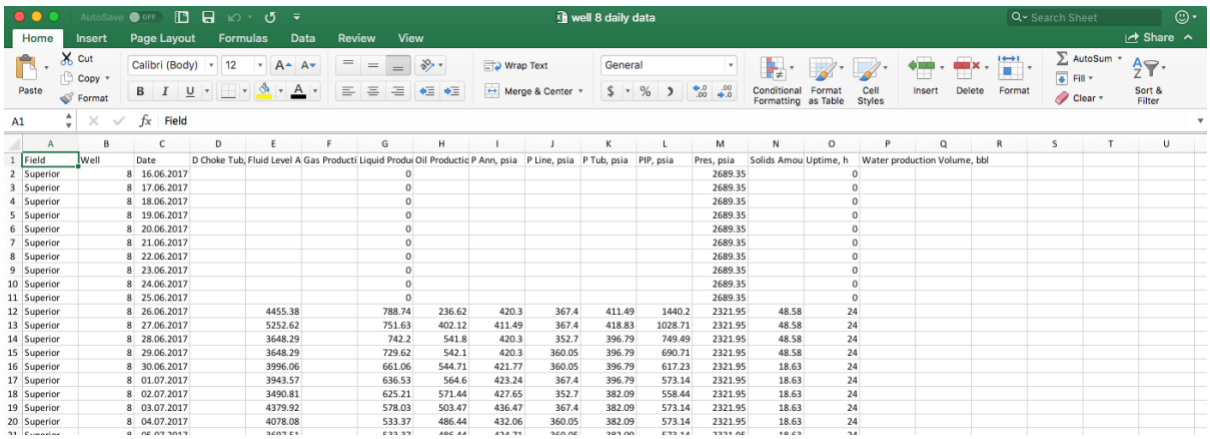
The post frac report suggests the well **JD** is 0.6.

The initial reservoir pressure at the well was measured to be 2689 psia.

The well was put on production with the ESP on 26.06.2017.

The field team routinely gathers the well measures and flow test data (dynamic fluid levels, annular pressures, oil, water, gas flowrates etc.). The ESP intake gauge data is also available through the SCADA system.

The well data is attached as “well 8 daily data.csv”.



Field	Well	Date	D Choke Tub,	Fluid Level A	Gas Producti	Liquid Produ	Oil Productio	P Ann, psia	P Line, psia	P Tub, psia	PIP, psia	Pres, psia	Solids Amou	Uptime, h	Water production Volume, bbl
Superior	8	16.06.2017				0						2689.35		0	
Superior	8	17.06.2017				0						2689.35		0	
Superior	8	18.06.2017				0						2689.35		0	
Superior	8	19.06.2017				0						2689.35		0	
Superior	8	20.06.2017				0						2689.35		0	
Superior	8	21.06.2017				0						2689.35		0	
Superior	8	22.06.2017				0						2689.35		0	
Superior	8	23.06.2017				0						2689.35		0	
Superior	8	24.06.2017				0						2689.35		0	
Superior	8	25.06.2017				0						2689.35		0	
Superior	8	26.06.2017		4455.38		788.74	236.62	420.3	367.4	411.49	1440.2	2321.95	48.58	24	
Superior	8	27.06.2017		5252.62		751.63	402.12	411.49	367.4	418.83	1028.71	2321.95	48.58	24	
Superior	8	28.06.2017		3648.29		742.2	541.8	420.3	352.7	396.79	749.49	2321.95	48.58	24	
Superior	8	29.06.2017		3648.29		729.62	542.1	420.3	360.05	396.79	690.71	2321.95	48.58	24	
Superior	8	30.06.2017		3996.06		661.06	544.71	421.77	360.05	396.79	617.23	2321.95	18.63	24	
Superior	8	01.07.2017		3943.57		636.53	564.6	423.24	367.4	396.79	573.14	2321.95	18.63	24	
Superior	8	02.07.2017		3490.81		625.21	571.44	427.65	352.7	382.09	558.44	2321.95	18.63	24	
Superior	8	03.07.2017		4379.92		578.03	503.47	436.47	367.4	382.09	573.14	2321.95	18.63	24	
Superior	8	04.07.2017		4078.08		533.37	486.44	432.06	360.05	382.09	573.14	2321.95	18.63	24	

Figure 1 . Well “8” daily data file

[1] Note that the well, reservoir, field names as well as well production data and dates were changed for the purpose of this study

Reservoir Data

The “B2” reservoir data is given below:

STOIIP		128 MMstb
Connate water saturation	Sw	35 %
Rock compressibility	cr	4.36E-6 $psia^{-1}$
Initial reservoir pressure	Pi	3262 psia
Initial reservoir temperature	Ti	212 F
Oil density		37 API
Bubble point pressure	Pb	2486 psia
Solution gas ratio	Rs	1011 scf/bbl
Gas specific gravity	SGgas	1.2
Water specific gravity	SGwater	1

Table 1 . “B2” reservoir data.

Data Input to the E&P Portal

Signing up

First open ep.pengtools.com in your browser and signup or login to the **E&P Portal**.

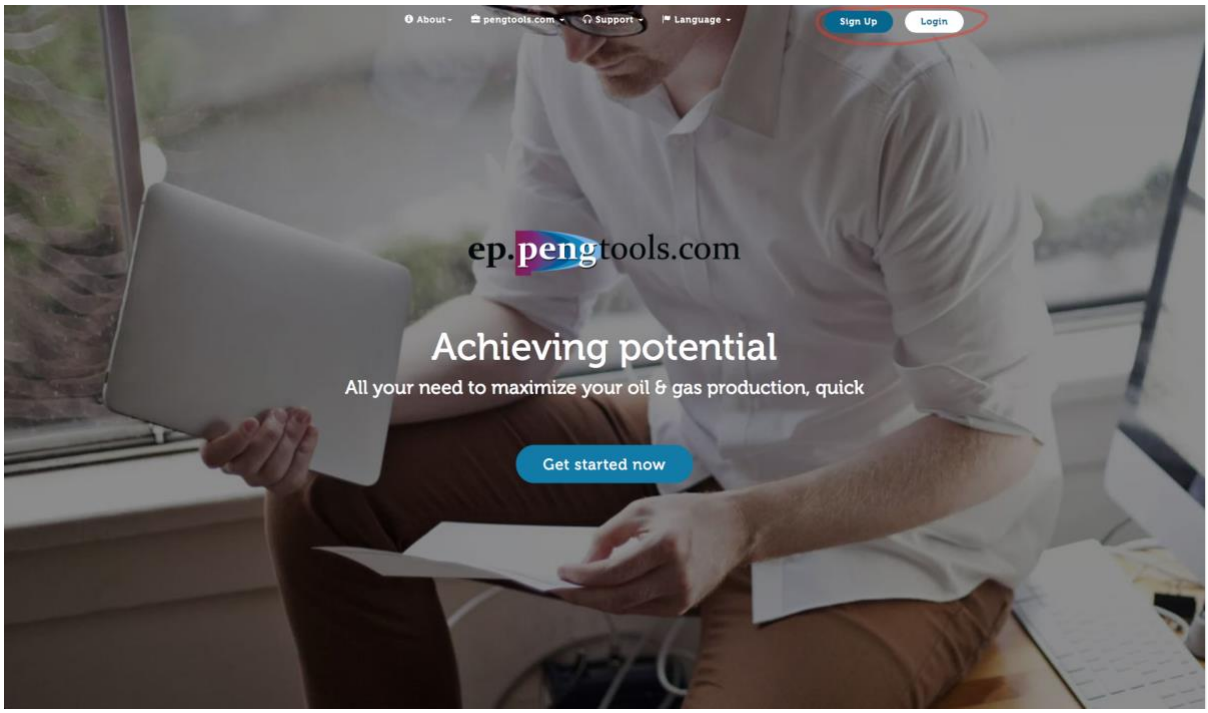


Figure 2 . E&P Portal landing page

After signing up /logging in you'll see the main **E&P Portal** page:

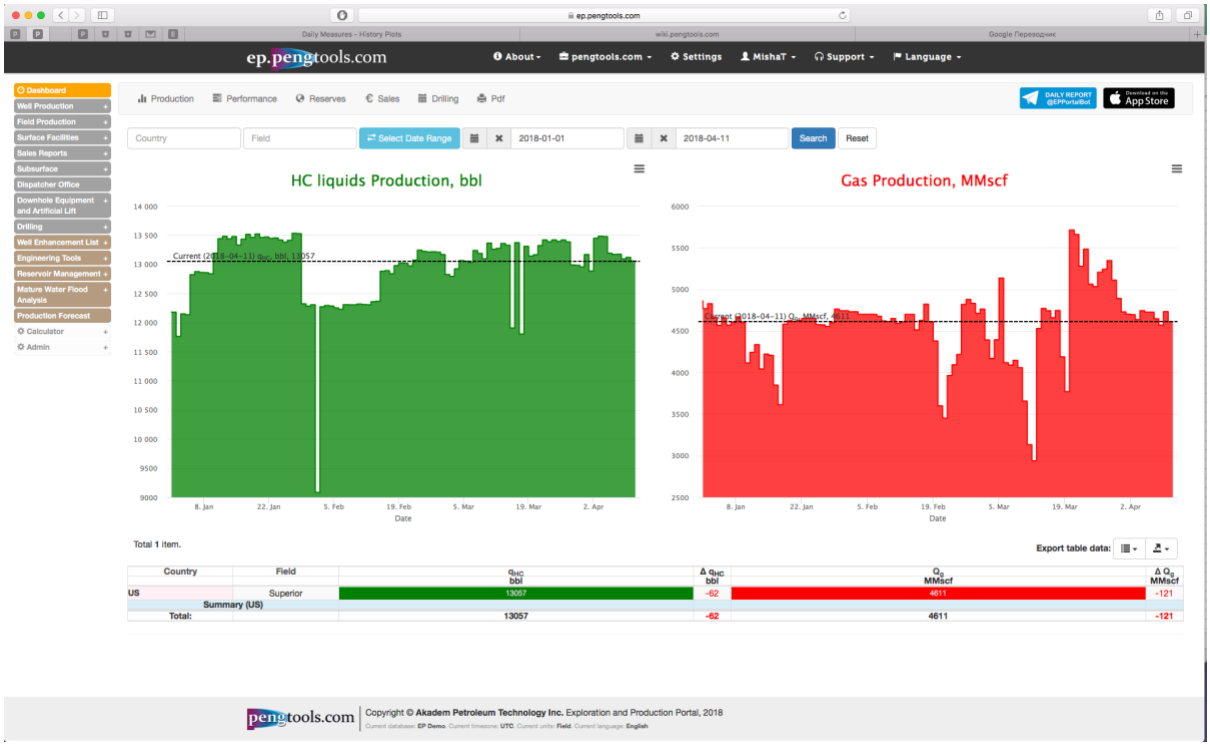


Figure 3 . Main page of the E&P Portal

Check the units in the page footer to be “Field”.

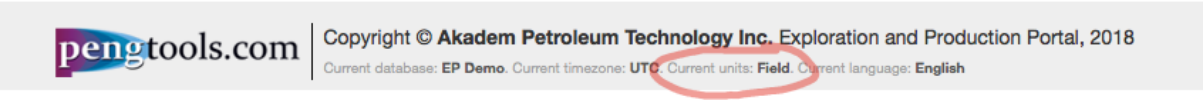


Figure 4. Field units in the main page footer

Check the current database in the page footer to be “EP Demo”.

Figure 5. Current database in the main page footer

Now you are ready to start entering the data into the **E&P Portal**

Adding the "Superior" field

In the left menu open the "Fields" page of the "Subsurface" module:

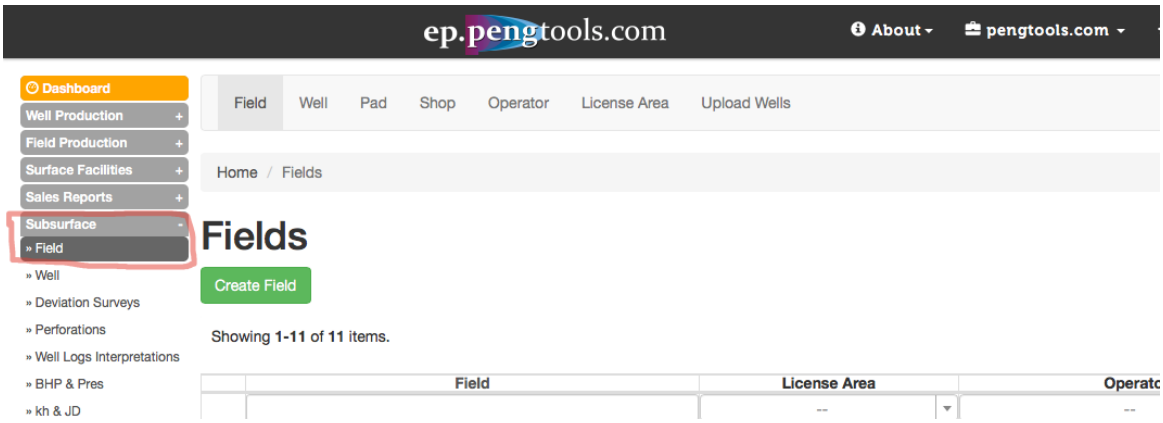


Figure 6. Fields page of subsurface module of the E&P Portal

Click "Create Field", fill the form as follows and click "Create":

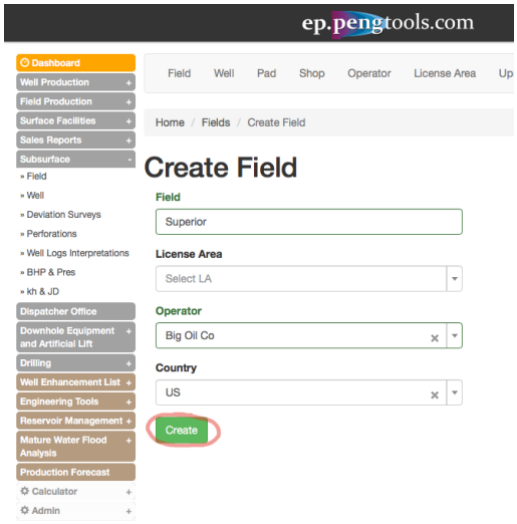


Figure 7. Creating the "Superior" field in the E&P Portal

Now you have successfully added the "Superior" field to the **E&P Portal**:

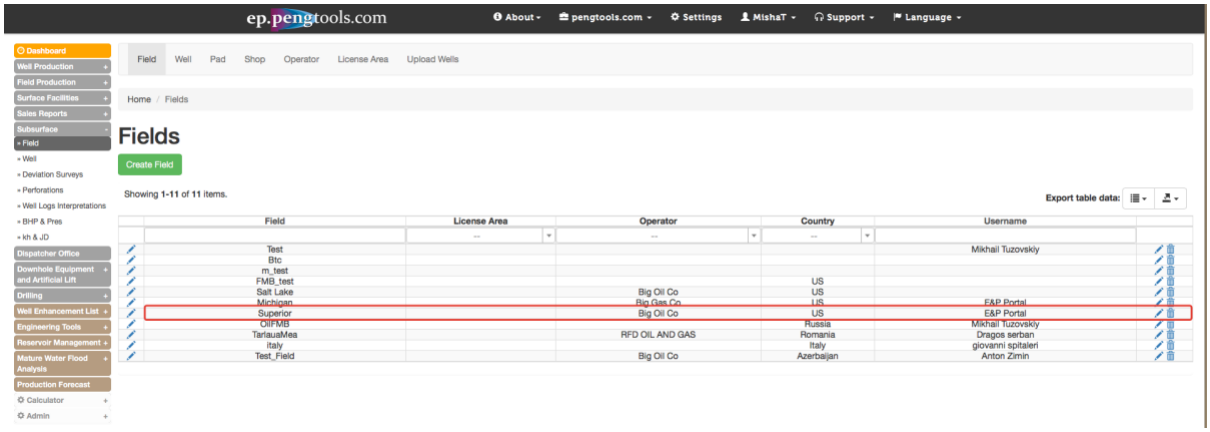


Figure 8. "Superior" field in the E&P Portal

Adding the "B2" reservoir

In the left menu open the "Reservoirs" page of the "Reservoir Management" module:

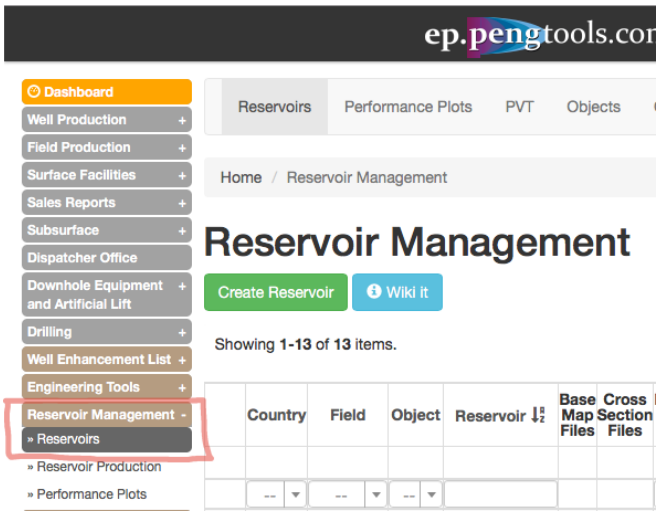


Figure 9. Reservoirs page of Reservoir Management module of the E&P Portal

Click "Create Reservoir", fill the form as follows and click "Create":

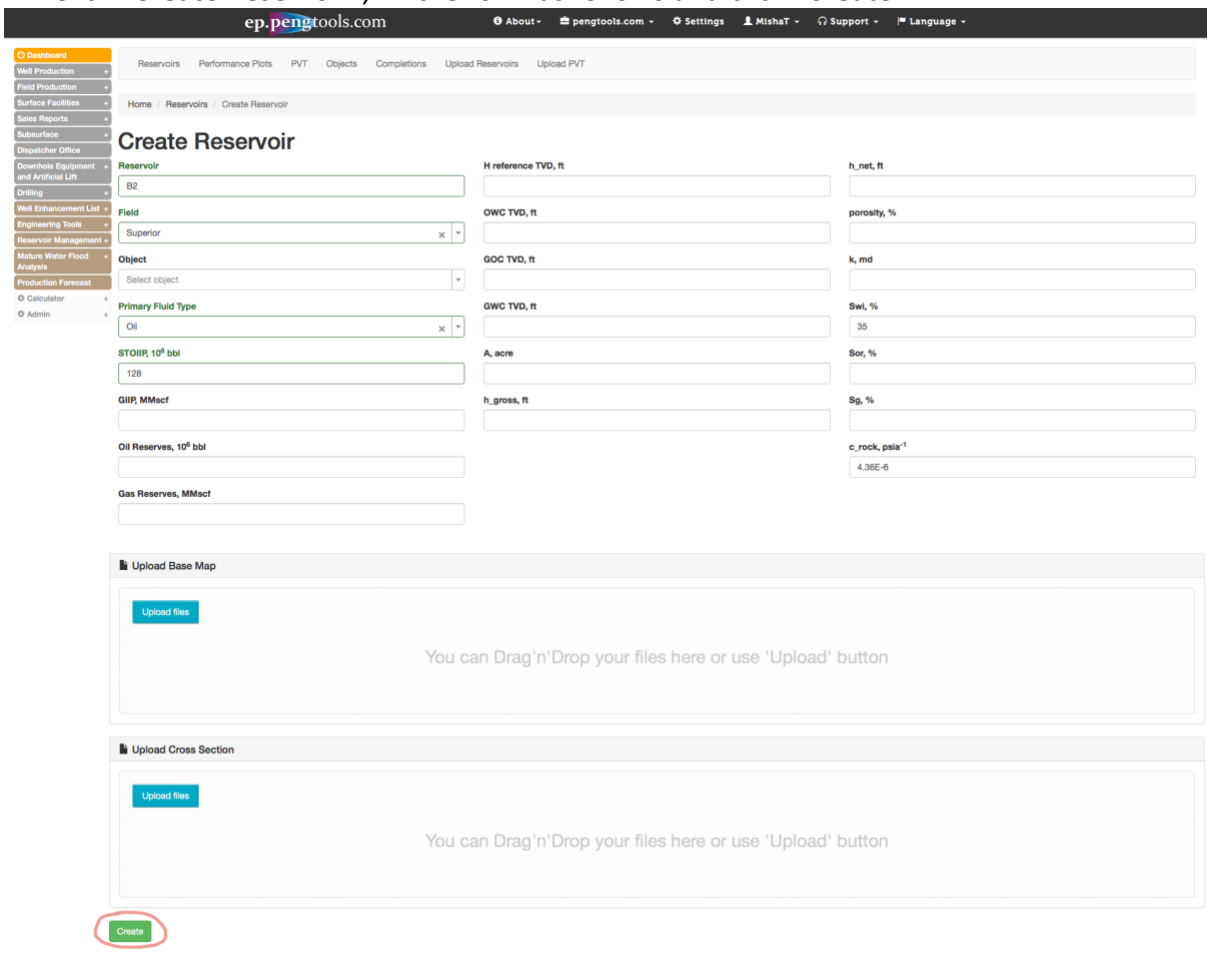


Figure 10. Creating the "B2" reservoir in the E&P Portal

Now you have successfully added the "B2" reservoir to the **E&P Portal**:

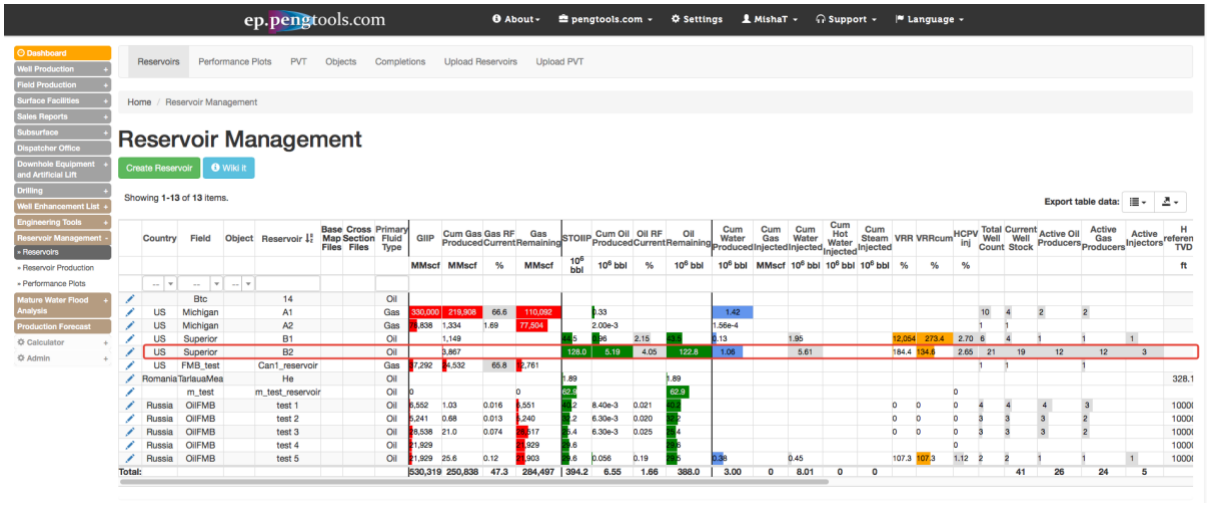


Figure 11. "B2" reservoir in the E&P Portal

Note that a number of the reservoir's parameters are automatically calculated based on the production data loaded to the system.

Creating the "B2" reservoir PVT model

In the top of the page click on the "PVT Tool" page:

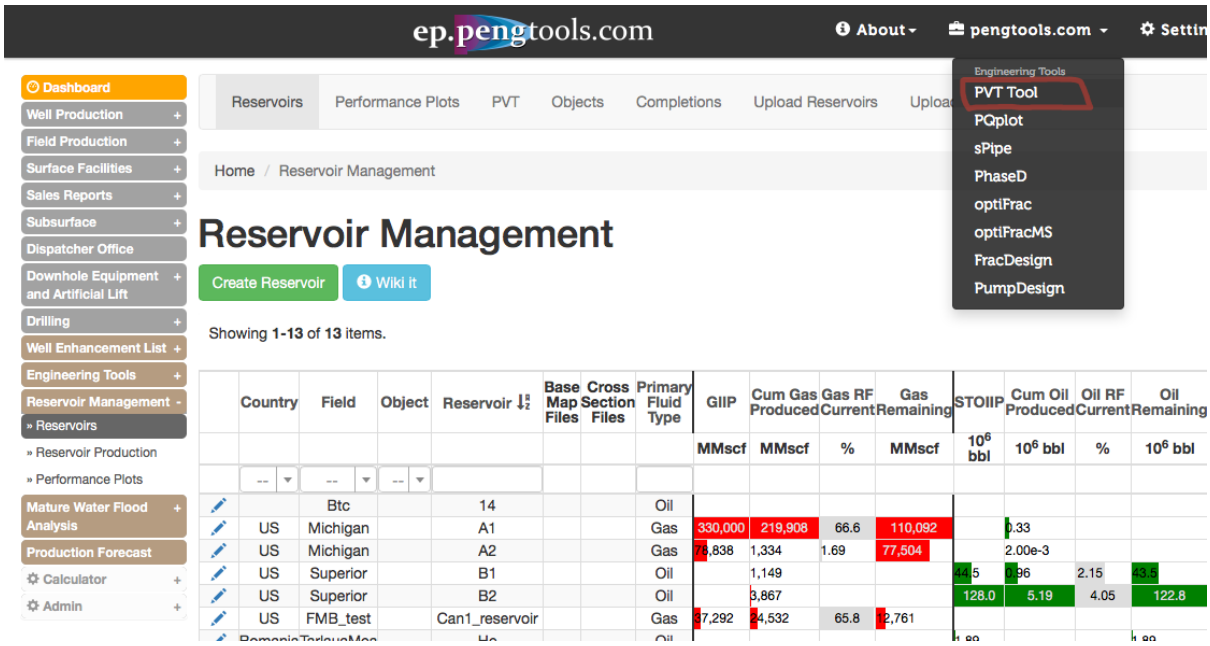
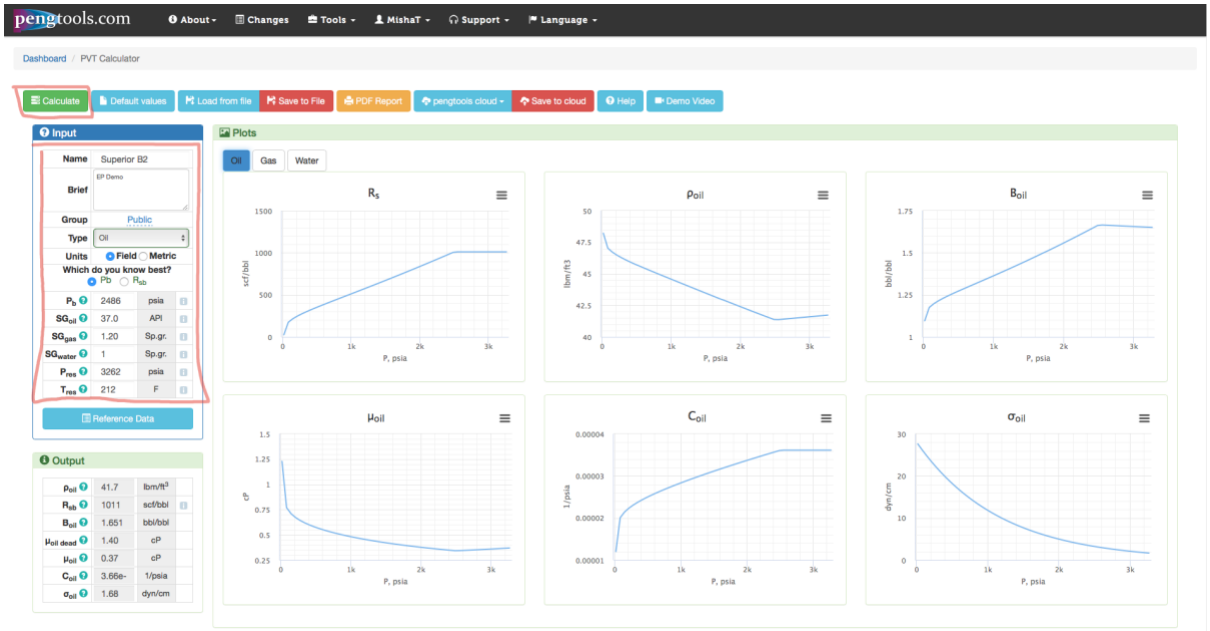


Figure 12. Opening the PVT Tool in the E&P Portal

Fill the form with the given data as follows and click "Calculate":



The "B2" reservoir PVT model is ready by now. Check the parameters plots on the "Oil", "Gas" and "Water" tabs. Model results are available in the Output section and the results table on each page.

Click "Save to cloud" to save the model.

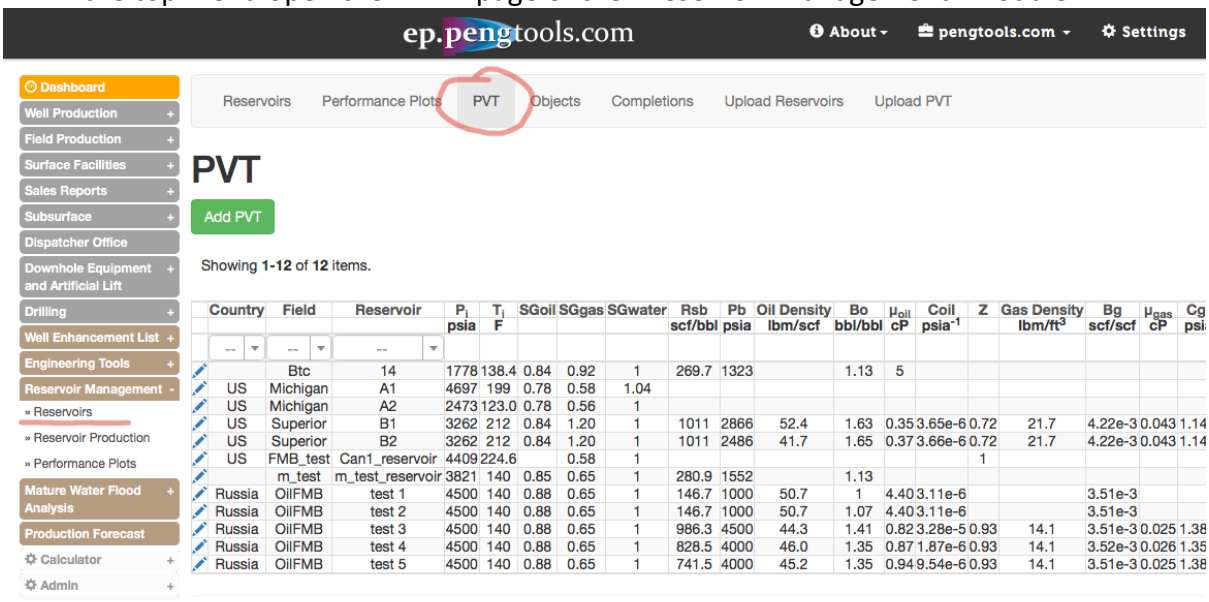
The summary of the model parameters is given below:

Pi, psia	3262	Z	0.72
Ti, F	212	Gas Density, lbm/ft3	21.7
SGoil	0.84 (37 API)	Bg, scf/scf	0.004218
SGgas	1.2	µgas, cP	0.043
SGwater	1	Cgas, psia-1	0.00011363713688852
Rsb, scf/bbl	1011	Water Density, lbm/ft3	60.180592
Pb, psia	2486	Bw, bbl/bbl	1.037
Oil density, lbm/scf	41.7	µwater, cP	0.29
Bo, bbl/stb	1.651	Cw, psia-1	3.1981709184194E-6
µoil, cP	0.37		
Coil, psia-1	3.66E-6		

Table 2. "B2" reservoir PVT model results

Adding the "B2" reservoir PVT model

In the top menu open the "PVT" page of the "Reservoir Management" module:



Country	Field	Reservoir	P_i psia	T_i F	SGoil	SGgas	SGwater	Rsb scf/bbl	Pb psia	Oil Density lbm/scf	Bo bbl/bbl	μ_{oil} cP	Coil $psia^{-1}$	Z	Gas Density lbm/ft^3	Bg scf/scf	μ_{gas} cP	Cg psi
	Btc	14	1778	138.4	0.84	0.92	1	269.7	1323		1.13	5						
US	Michigan	A1	4697	199	0.78	0.58	1.04											
US	Michigan	A2	2473	123.0	0.78	0.56	1											
US	Superior	B1	3262	212	0.84	1.20	1	1011	2866	52.4	1.63	0.35	3.65e-6	0.72	21.7	4.22e-3	0.043	1.14
US	Superior	B2	3262	212	0.84	1.20	1	1011	2486	41.7	1.65	0.37	3.66e-6	0.72	21.7	4.22e-3	0.043	1.14
US	FMB_test	Can1_reservoir	4409	224.6		0.58	1							1				
	m_test	m_test_reservoir	3821	140	0.85	0.65	1	280.9	1552		1.13							
Russia	OilFMB	test 1	4500	140	0.88	0.65	1	146.7	1000	50.7	1	4.40	3.11e-6			3.51e-3		
Russia	OilFMB	test 2	4500	140	0.88	0.65	1	146.7	1000	50.7	1.07	4.40	3.11e-6			3.51e-3		
Russia	OilFMB	test 3	4500	140	0.88	0.65	1	986.3	4500	44.3	1.41	0.82	3.28e-5	0.93	14.1	3.51e-3	0.025	1.38
Russia	OilFMB	test 4	4500	140	0.88	0.65	1	828.5	4000	46.0	1.35	0.87	1.87e-6	0.93	14.1	3.52e-3	0.026	1.35
Russia	OilFMB	test 5	4500	140	0.88	0.65	1	741.5	4000	45.2	1.35	0.94	9.54e-6	0.93	14.1	3.51e-3	0.025	1.38

Figure 13. Reservoirs PVT page of Reservoir Management module of the E&P Portal

Click "Add PVT", fill the form as follows and click "Create":

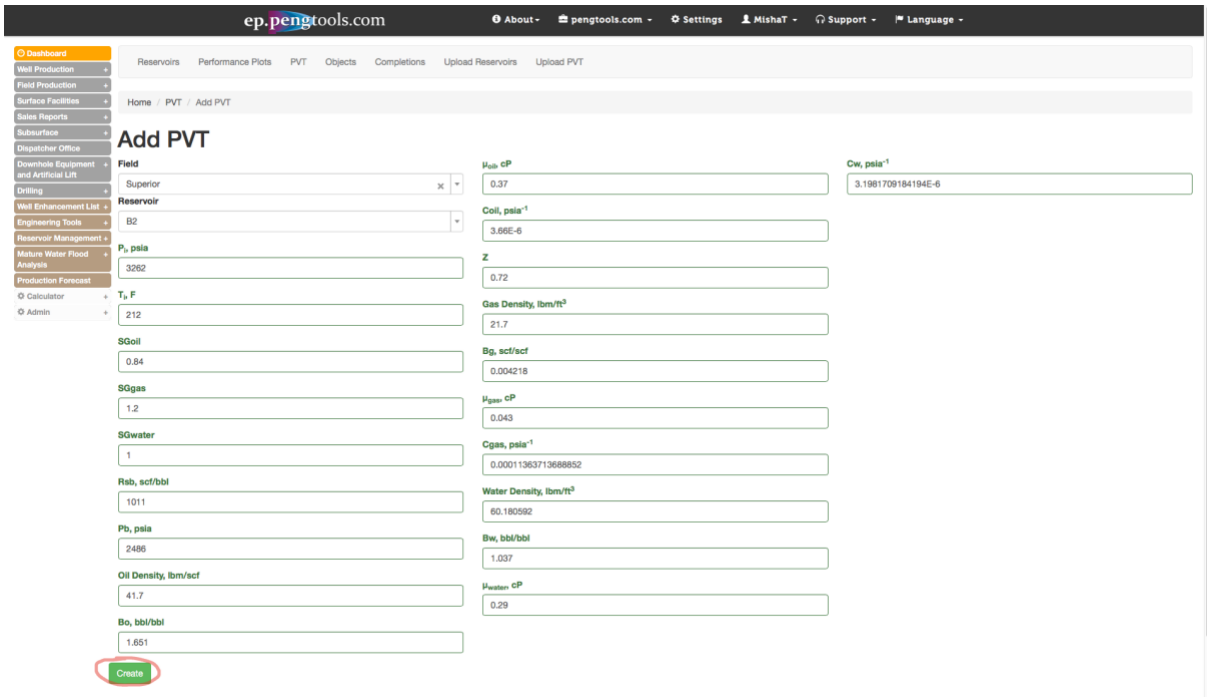
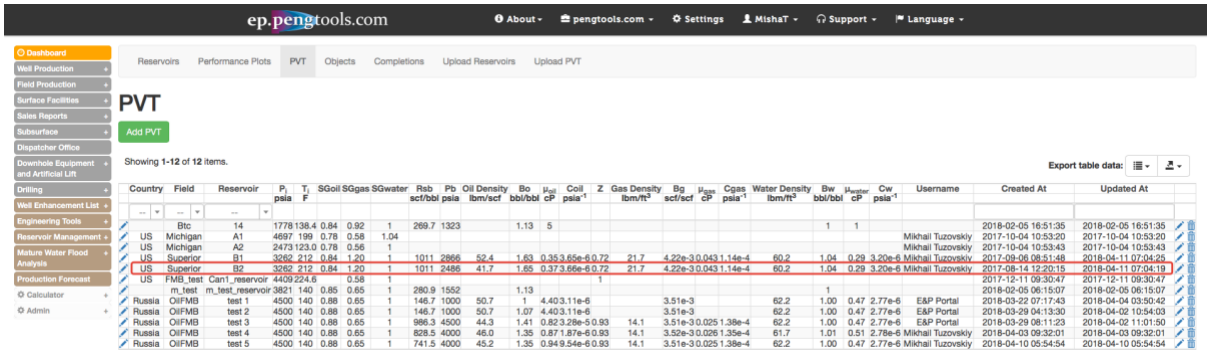


Figure 14. Creating the PVT model in the E&P Portal

Note that PVT parameters are copied from the PVT model created on the previous step.

Now you have successfully added the "B2" reservoir PVT model to the **E&P Portal**:



Country	Field	Reservoir	P_i psia	T_i F	SGoil	SGgas	SGwater	Rsb scf/bbl	Pb psia	Oil Density lbm/scf	Bo bbl/bbl	μ_{oil} cP	Coil $psia^{-1}$	Z	Gas Density lbm/ft^3	Bg scf/scf	μ_{gas} cP	Cgas $psia^{-1}$	Water Density lbm/ft^3	Bw bbl/bbl	μ_{water} cP	Cw $psia^{-1}$	Username	Created At	Updated At
		Btc	14	1778	138.4	0.84	0.92	1	269.7	1323		1.13	5							1	1			2018-02-05 16:51:35	2018-02-05 16:51:35
US	Michigan	A1	4697	199	0.78	0.58	1.04																Mikhail Tuzovskiy	2017-10-04 10:53:20	2017-10-04 10:53:20
US	Michigan	A2	2473	123.0	0.78	0.56	1																Mikhail Tuzovskiy	2017-10-04 10:53:43	2017-10-04 10:53:43
US	Superior	B1	3262	212	0.84	1.20	1	1011	2866	52.4	1.63	0.353	6.65e-6	0.72	21.7	4.22e-3	0.043	1.14e-4	60.2	1.04	0.29	3.20e-6	Mikhail Tuzovskiy	2017-09-06 08:51:48	2018-04-11 07:04:25
US	Superior	B2	3262	212	0.84	1.20	1	1011	2486	41.7	1.65	0.373	6.66e-6	0.72	21.7	4.22e-3	0.043	1.14e-4	60.2	1.04	0.29	3.20e-6	Mikhail Tuzovskiy	2017-08-14 12:20:15	2018-04-11 07:04:19
US	FMB_test	Can1_reservoir	4409	224.6		0.58	1							1										2017-12-11 09:30:47	2017-12-11 09:30:47
	m_test	m_test_reservoir	3821	140	0.85	0.65	1	280.9	1552		1.13									1				2018-02-05 06:15:07	2018-02-05 06:15:07
Russia	OilFMB	test 1	4500	140	0.88	0.65	1	146.7	1000	50.7	1	4.40	3.11e-6			3.51e-3			62.2	1.00	0.47	2.77e-6	E&P Portal	2018-03-22 07:17:43	2018-04-04 03:50:42
Russia	OilFMB	test 2	4500	140	0.88	0.65	1	146.7	1000	50.7	1.07	4.40	3.11e-6			3.51e-3			62.2	1.00	0.47	2.77e-6	E&P Portal	2018-03-29 04:13:30	2018-04-02 10:54:03
Russia	OilFMB	test 3	4500	140	0.88	0.65	1	986.3	4500	44.3	1.41	0.82	3.28e-5	0.93	14.1	3.51e-3	0.025	1.38e-4	62.2	1.00	0.47	2.77e-6	E&P Portal	2018-03-29 08:11:23	2018-04-02 11:01:50
Russia	OilFMB	test 4	4500	140	0.88	0.65	1	828.5	4000	46.0	1.35	0.87	1.87e-6	0.93	14.1	3.52e-3	0.026	1.35e-4	61.7	1.01	0.51	2.78e-6	Mikhail Tuzovskiy	2018-04-03 09:32:01	2018-04-03 09:32:01
Russia	OilFMB	test 5	4500	140	0.88	0.65	1	741.5	4000	45.2	1.35	0.94	9.54e-6	0.93	14.1	3.51e-3	0.025	1.38e-4	62.2	1.00	0.47	2.77e-6	Mikhail Tuzovskiy	2018-04-10 05:54:54	2018-04-10 05:54:54

Figure 15. Reservoirs PVT page of Reservoir Management module of the E&P Portal

Adding the well "8"

In the left menu open the "Well" page of the "Subsurface" module:

Figure 16. Well page of Subsurface module of the E&P Portal

Click "Create Well", fill the form as follows and click "Create":

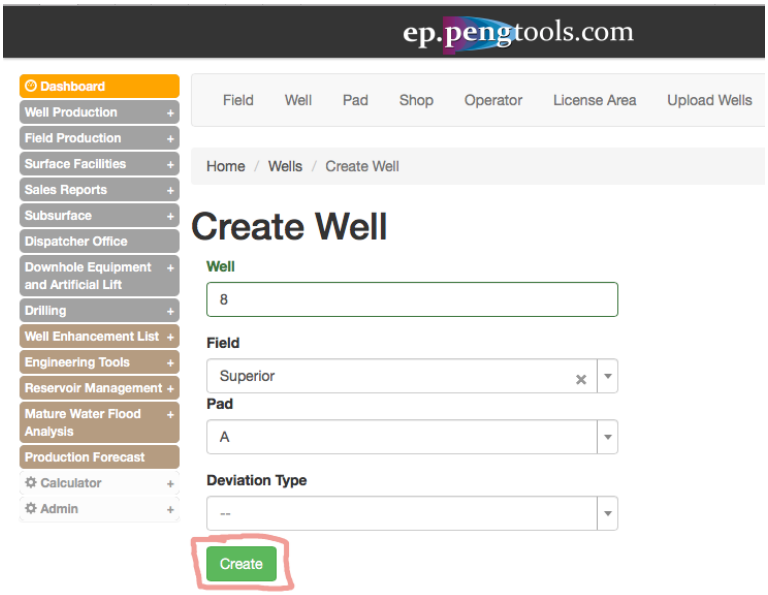


Figure 17. Creating the well "8" in the E&P Portal

Now you have successfully added well "8" to the **E&P Portal**:

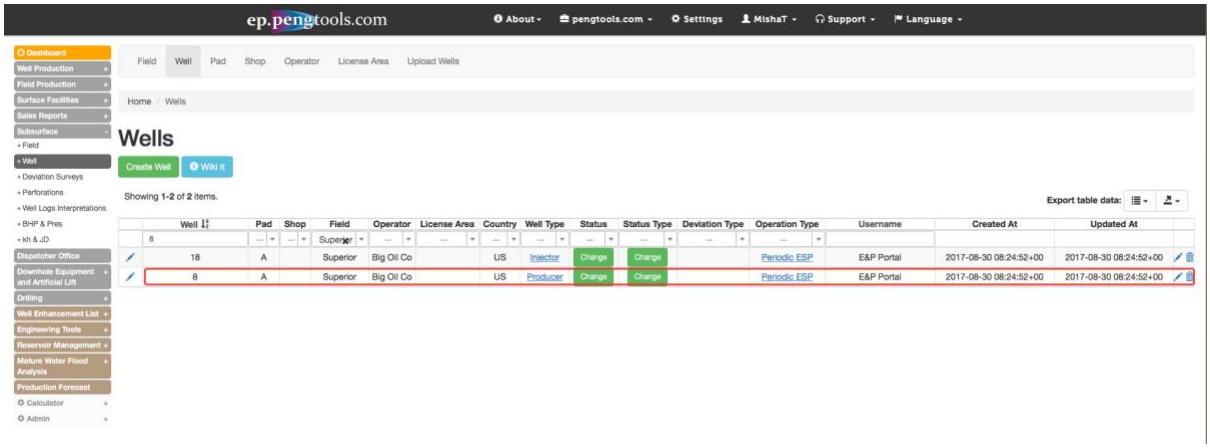


Figure 18. Well "8" in the E&P Portal

Adding the well “8” perforations

In the left menu open the “Perforations” page of the “Subsurface” module:

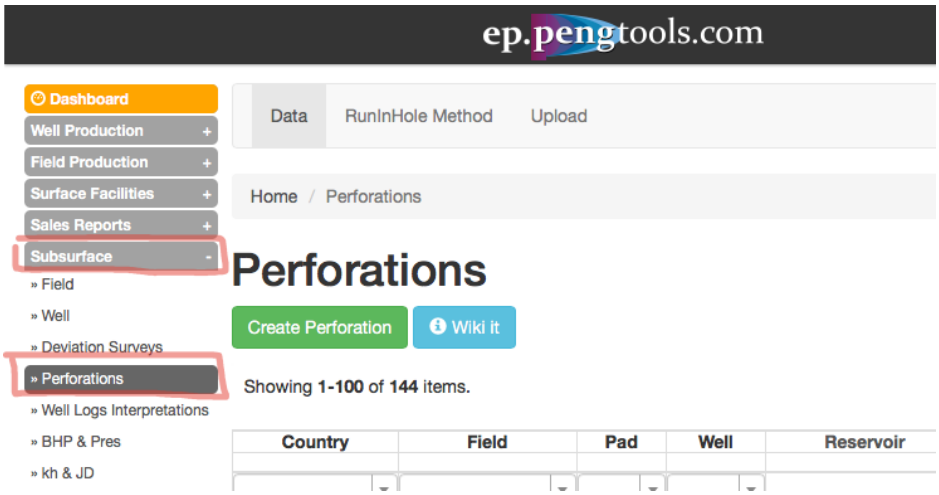


Figure 19. Perforations page of Subsurface module of the E&P Portal

Click “Create Perforation”, fill the form as follows and click “Create”:

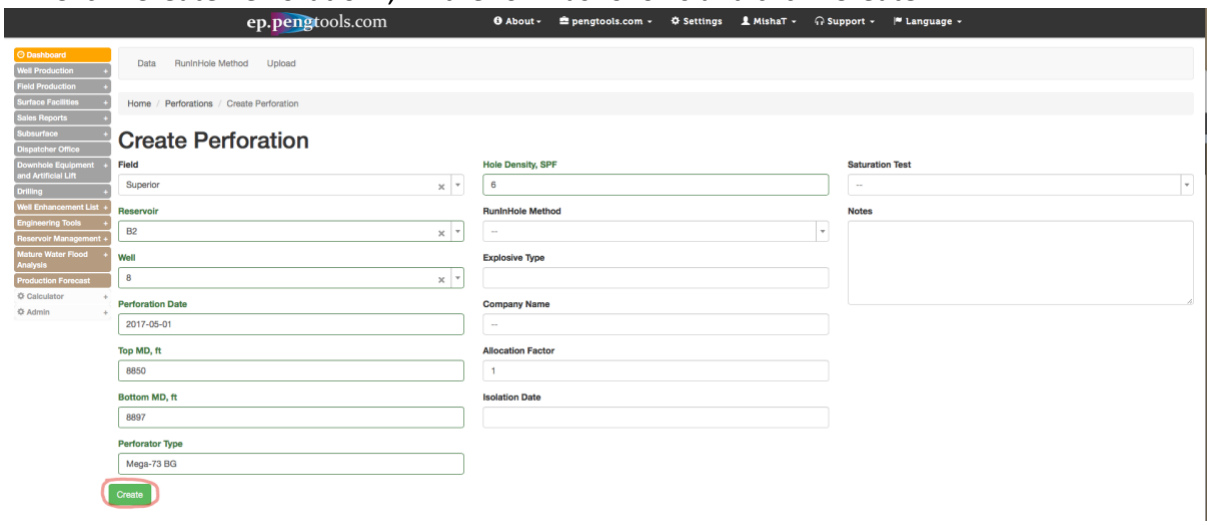


Figure 20. Creating the well “8” perforations in the E&P Portal

Now you have successfully added well “8” perforations to the **E&P Portal**:

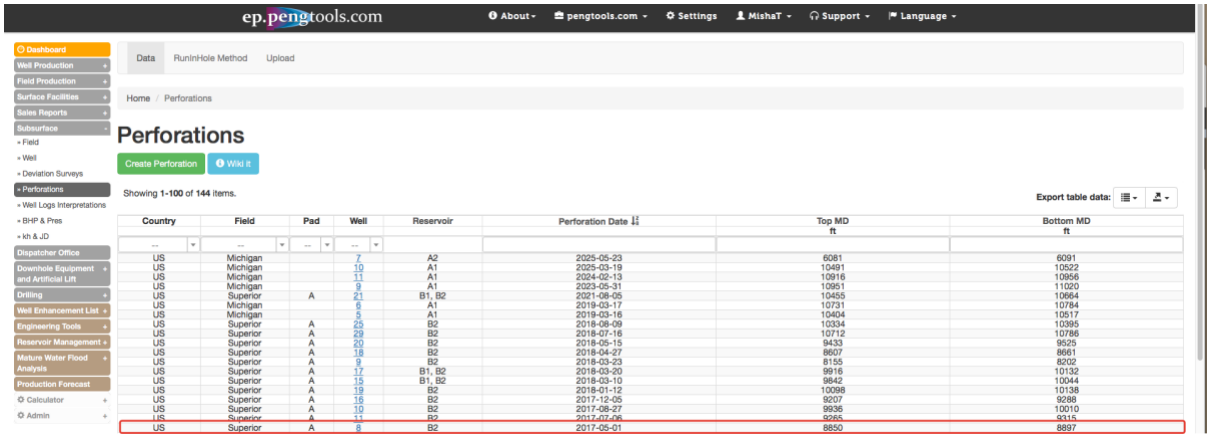


Figure 21. Well “8” perforations in the E&P Portal

Adding the well “8” kh and JD

In the left menu open the “kh & JD” page of the “Subsurface” module:

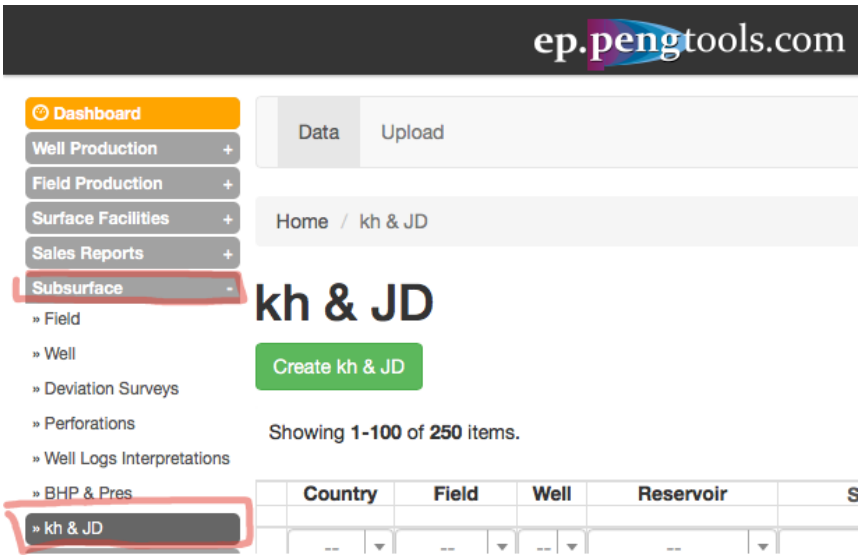


Figure 22. kh & JD page of Subsurface module of the E&P Portal

Click “Create Perforation”, fill the form as follows and click “Create”:

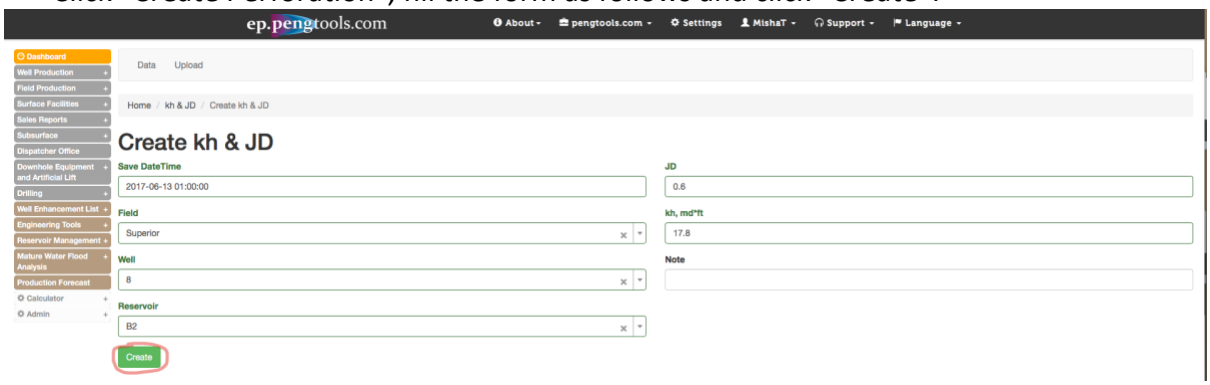


Figure 23. Creating the well “8” kh and JD in the E&P Portal

Now you have successfully added well “8” kh & JD to the **E&P Portal**:

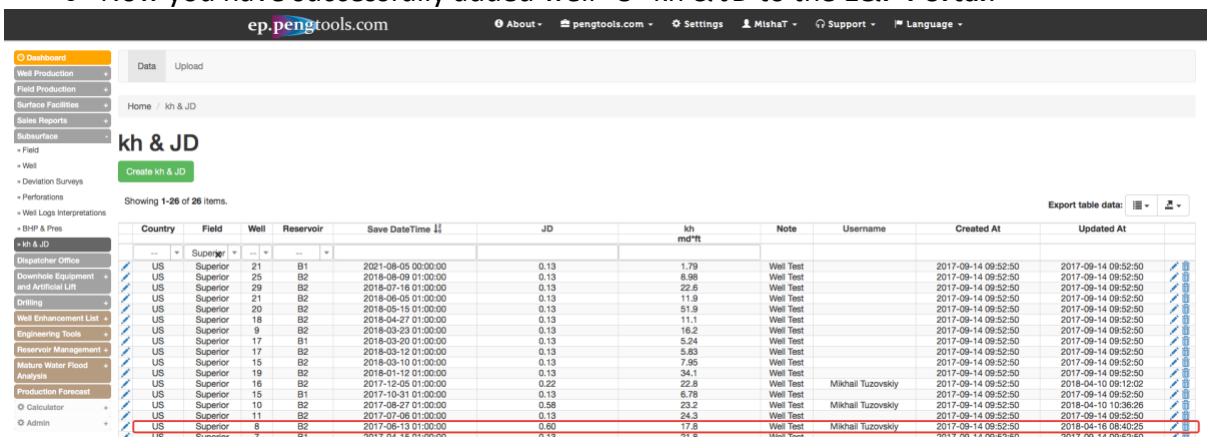


Figure 24. Well “8” kh & JD in the E&P Portal

Upload the well “8” daily production data

In the left menu open the “Daily Data” page of the “Well Production” module:

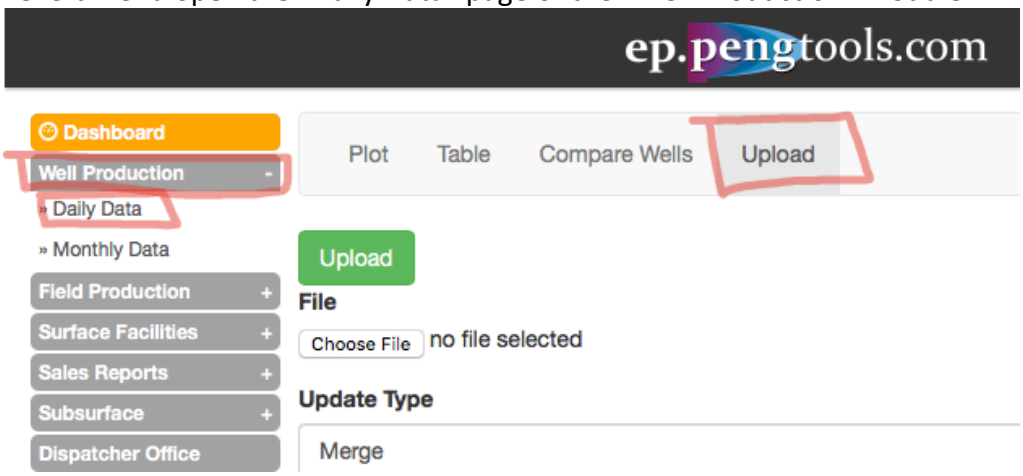


Figure 25. Wells daily data upload page of the E&P Portal

Fill the form as follows and click “Upload”:

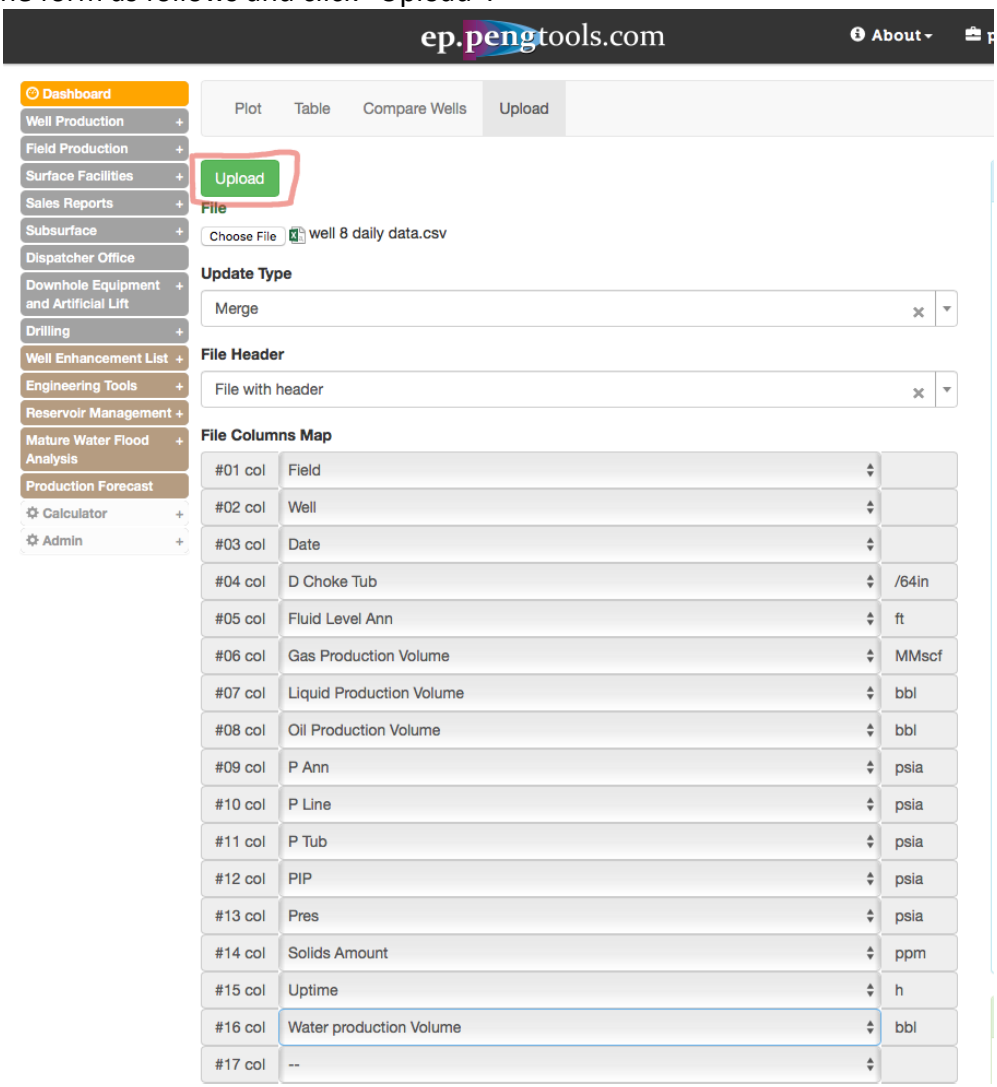


Figure 26. Well “8” daily data upload to the E&P Portal

Wait for the message showing the data upload status:

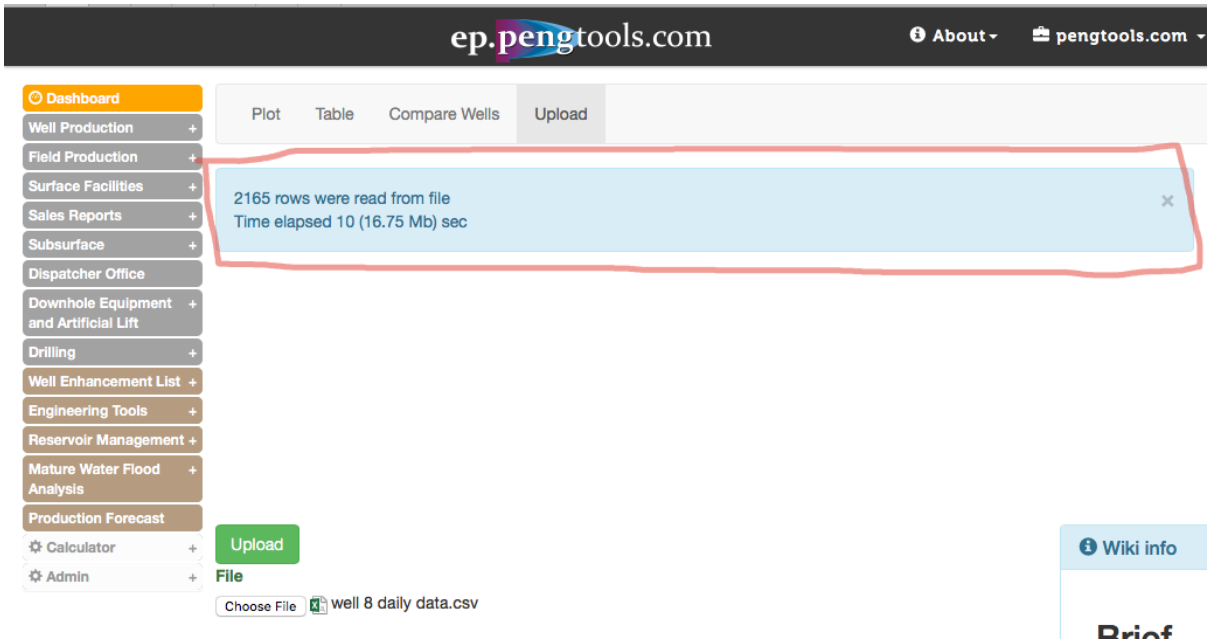


Figure 27. Well "8" daily data upload status message

Now you have successfully uploaded the well "8" daily data to the **E&P Portal**:

Let's visually inspect the data uploaded. In the top menu click the "Plot". Fill the filter as follows and click "Search":

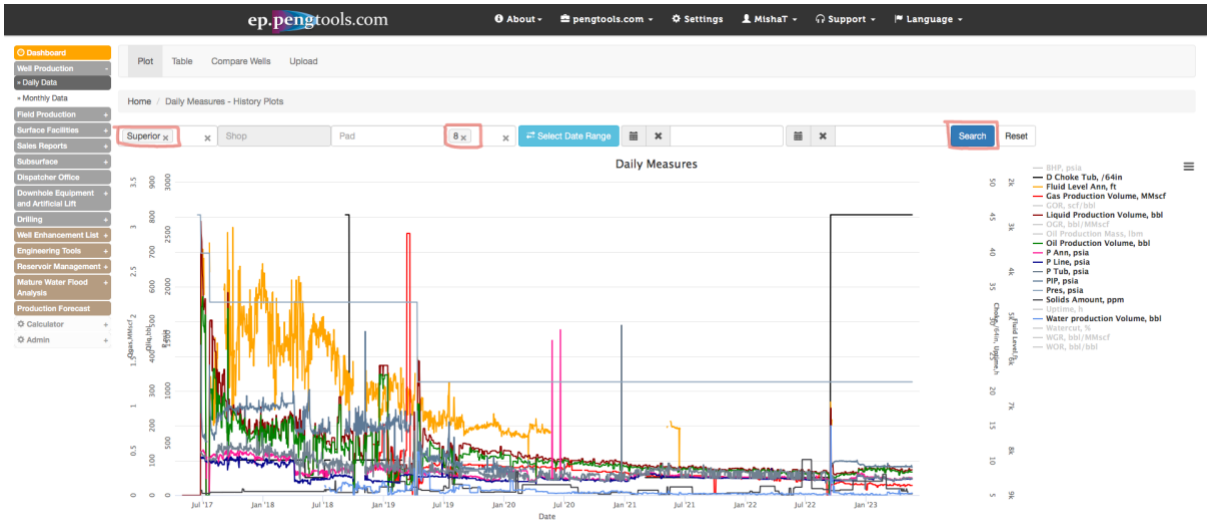


Figure 28. Well "8" daily data visualization

Adding the well "8" casing design

In the left menu open the "Well Design" page of the "Drilling" module:

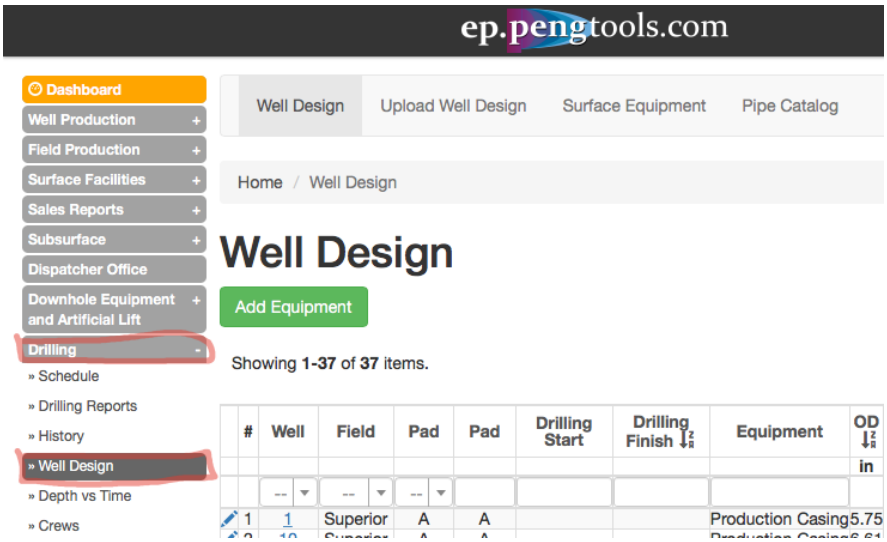


Figure 29. Well Design page of the Drilling module of the E&P Portal

Adding the Conductor: Click "Add Equipment", fill the form as follows and click "Create":

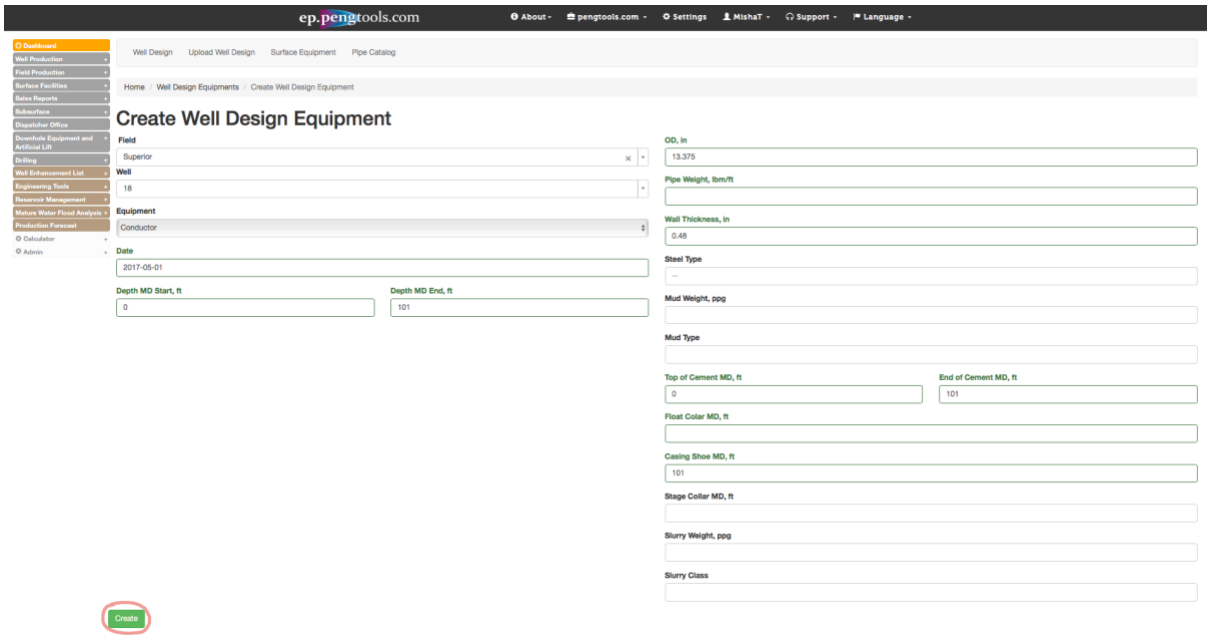


Figure 30. Creating Well "8" conductor in the E&P Portal

Adding the Surface casing: Click "Add Equipment", fill the form as follows and click "Create":

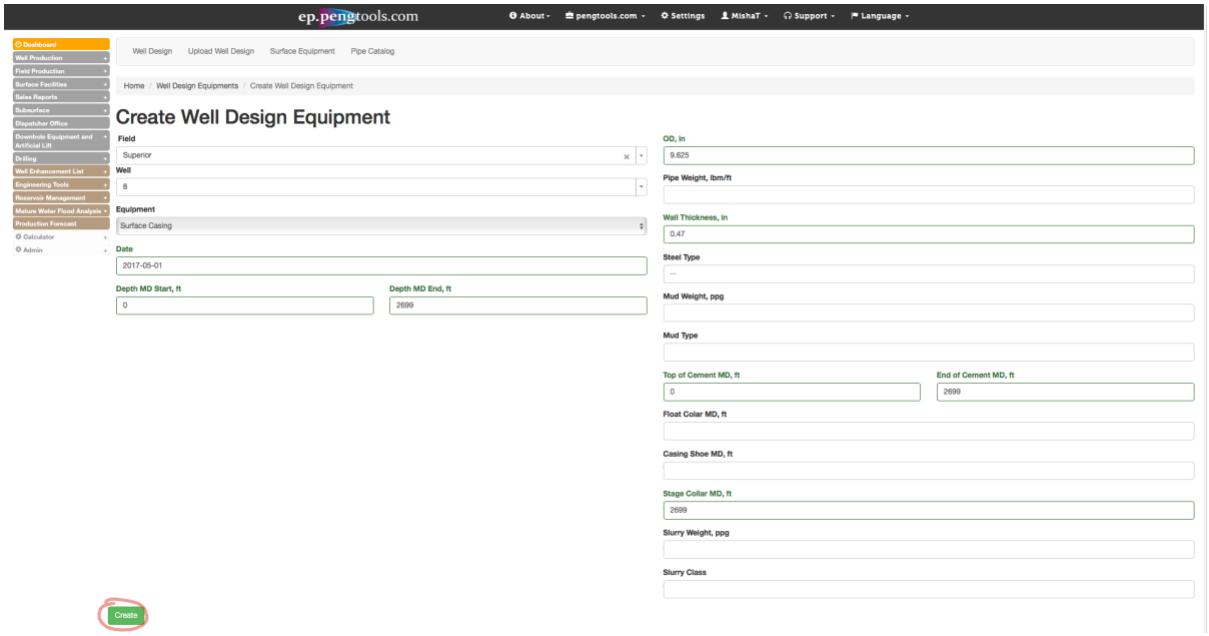


Figure 31. Creating Well "8" surface casing in the E&P Portal

Adding the Production casing: Click "Add Equipment", fill the form as follows and click "Create":

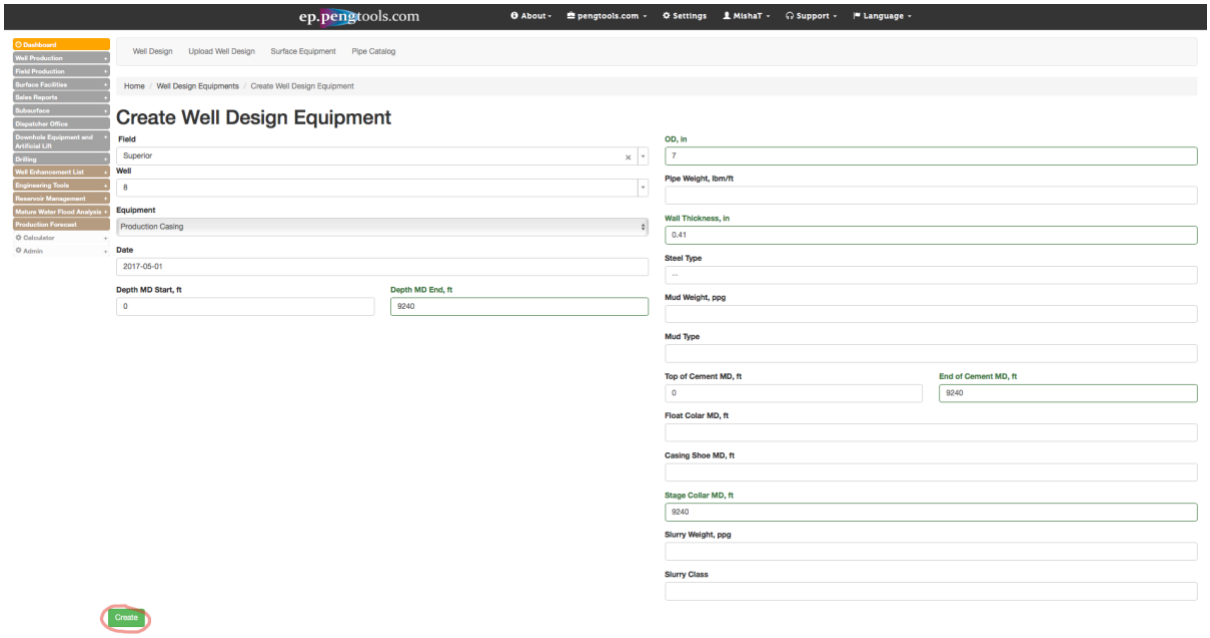


Figure 32. Creating Well "8" production casing in the E&P Portal

Now you have successfully added well "8" casing design to the **E&P Portal**:

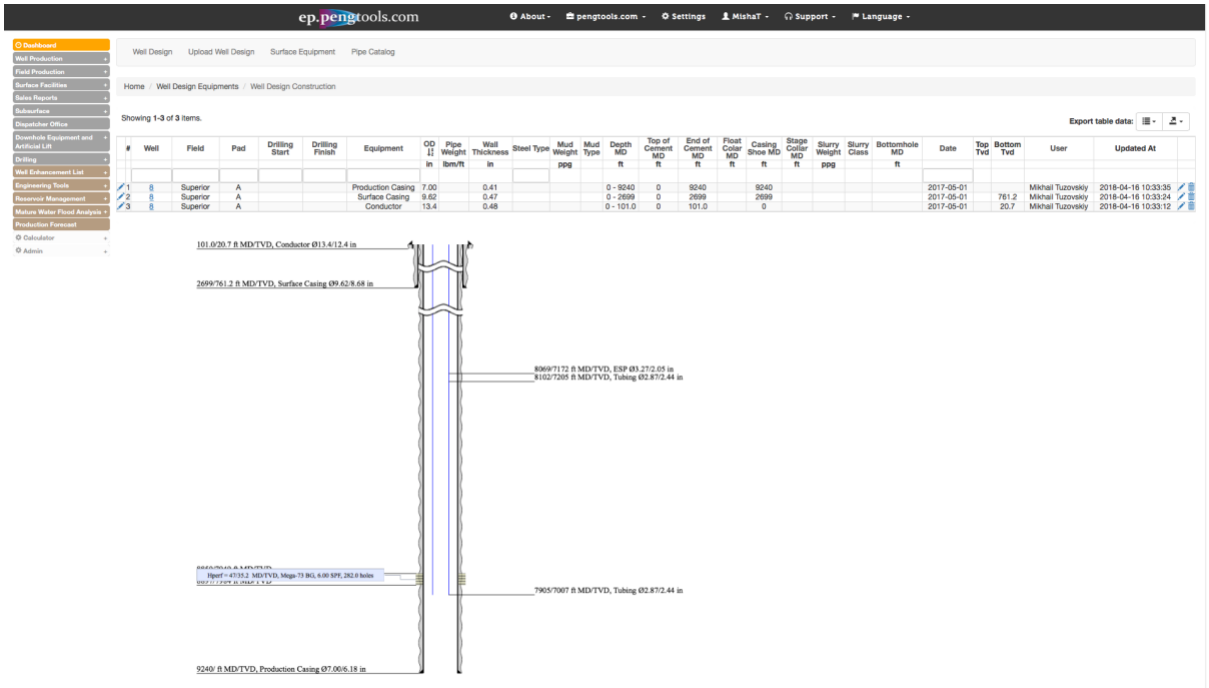


Figure 33. Well "8" schematic in the E&P Portal

Adding the well “8” downhole equipment

In the left menu open the “Downhole Equipment” page of the “Downhole Equipment and Artificial Lift” module:

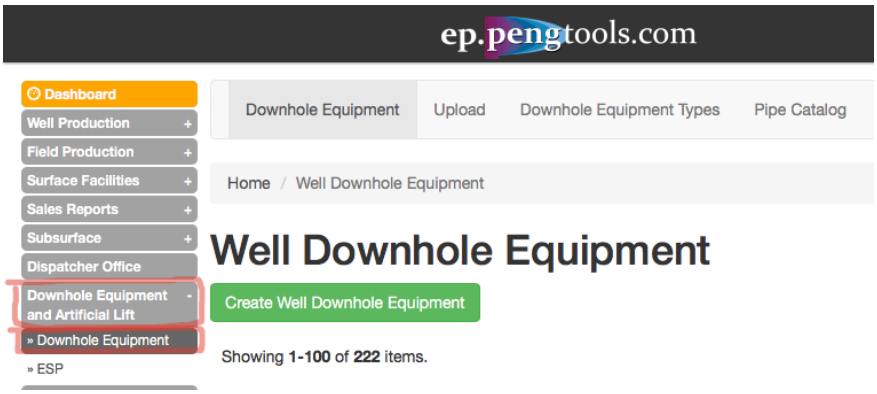


Figure 34. Well Downhole Equipment page of the Downhole Equipment and Artificial Lift module of the E&P Portal

Click “Create Well Downhole Equipment”, fill the form as follows and click “Create”:

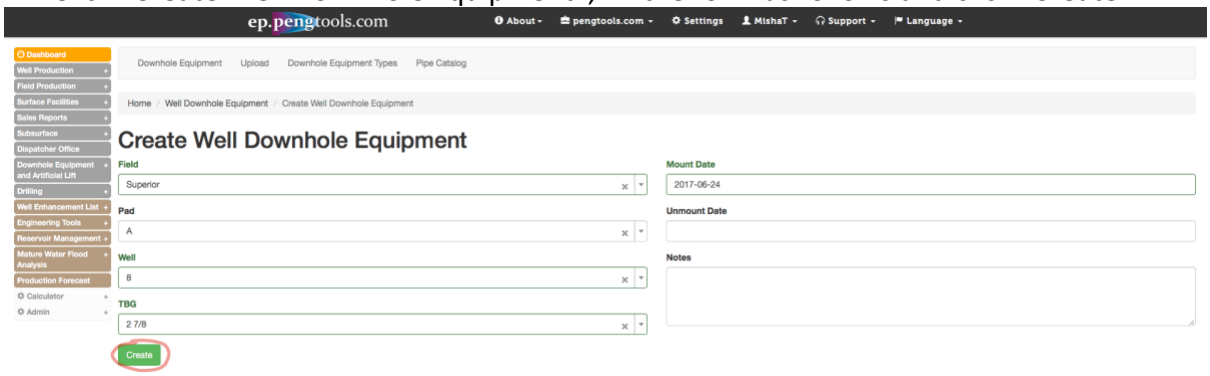


Figure 35. Creating the well “8” downhole equipment in the E&P Portal

Next click on the “well name” to define the completion string elements:

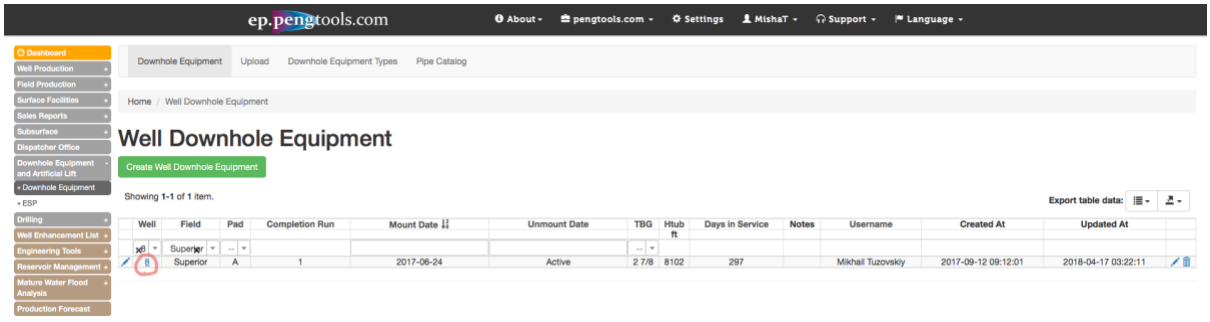


Figure 36. Well “8” downhole equipment in the E&P Portal

Click “Add Well Downhole Equipment Element:

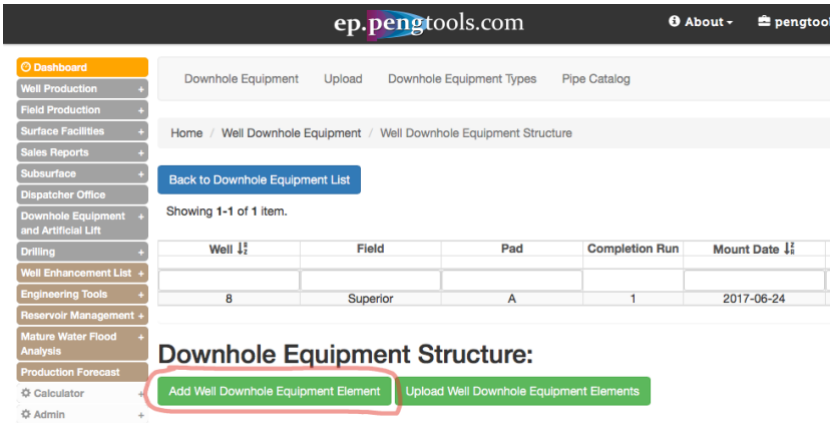


Figure 37. Adding well "8" Completion string elements in the E&P Portal

Add the first part of the completion string: Fill the from as follows and click "Create":

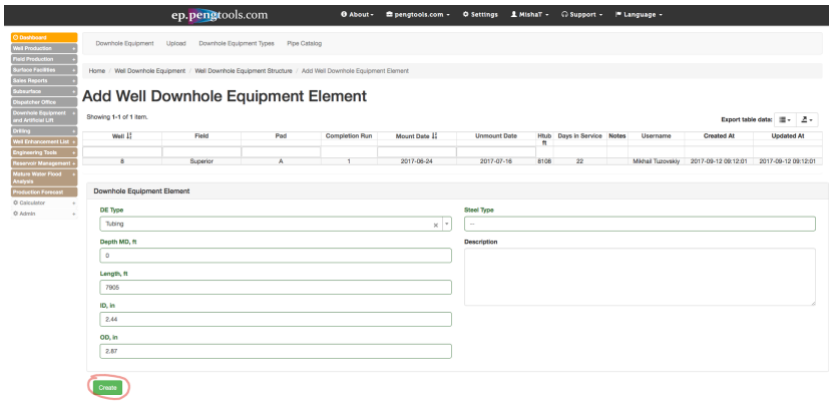


Figure 38. Adding well "8" tubing top in the E&P Portal

Add the ESP: Fill the from as follows and click "Create":

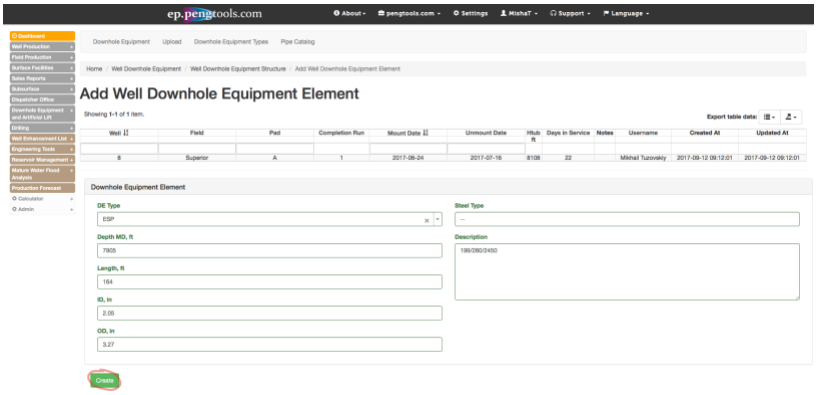


Figure 39. Adding well "8" ESP in the E&P Portal

Add the last part of the completion string: Fill the from as follows and click "Create":

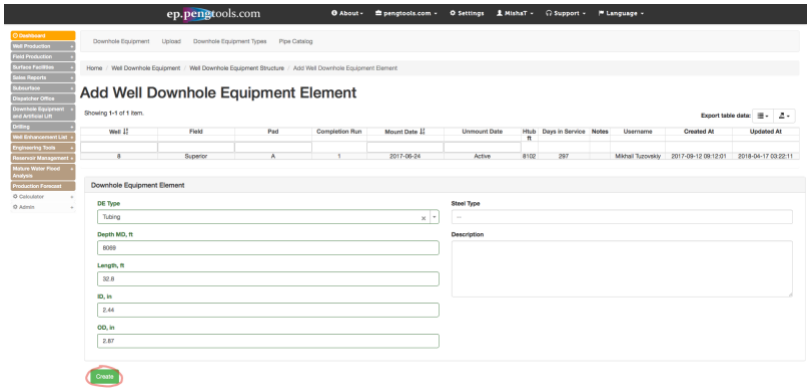


Figure 40. Adding well "8" tubing bottom in the E&P Portal

Now you have successfully added well "8" downhole equipment to the **E&P Portal**:

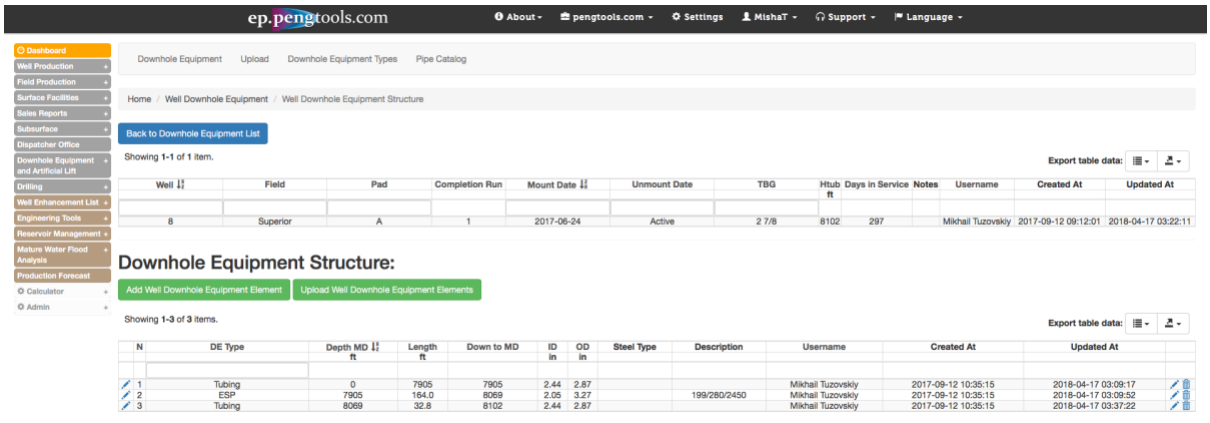


Figure 41. Well "8" downhole equipment elements in the E&P Portal

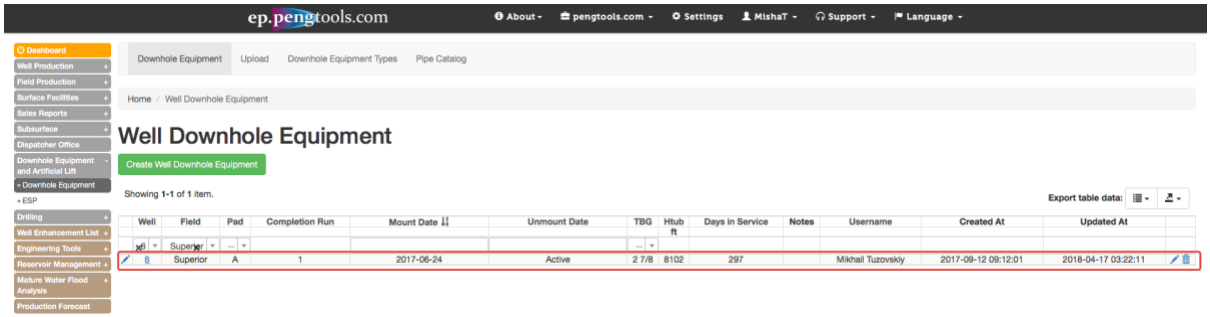


Figure 42. Well "8" downhole equipment in the E&P Portal

Calculating the well “8” flowing bottomhole pressure

In the left menu open the “BHP Calculation” page of the “Calculator” module.

Fill the filter as follows[2] and click “Search”.

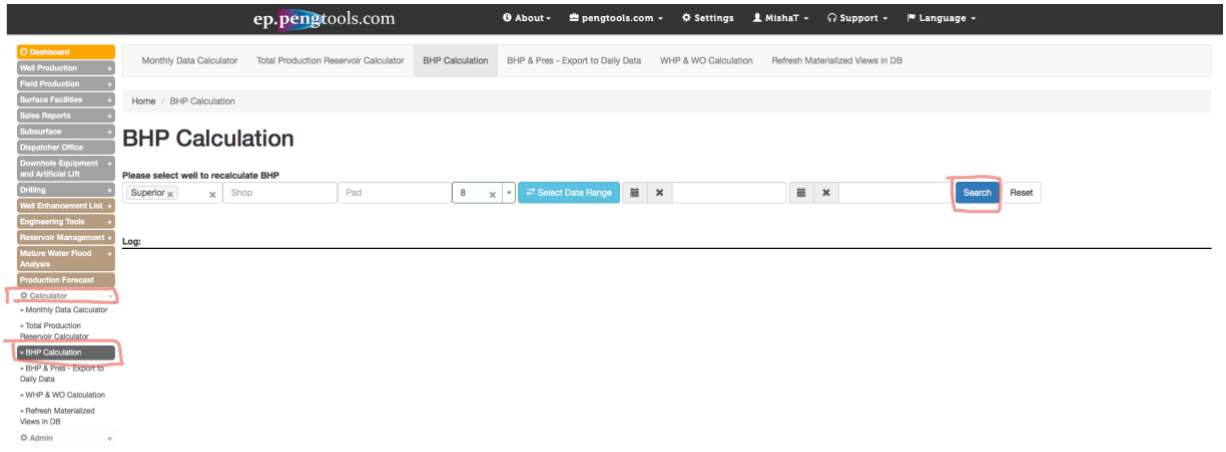


Figure 43. BHP Calculator page in the E&P Portal

Inspect the BHP calculation results in the results table:

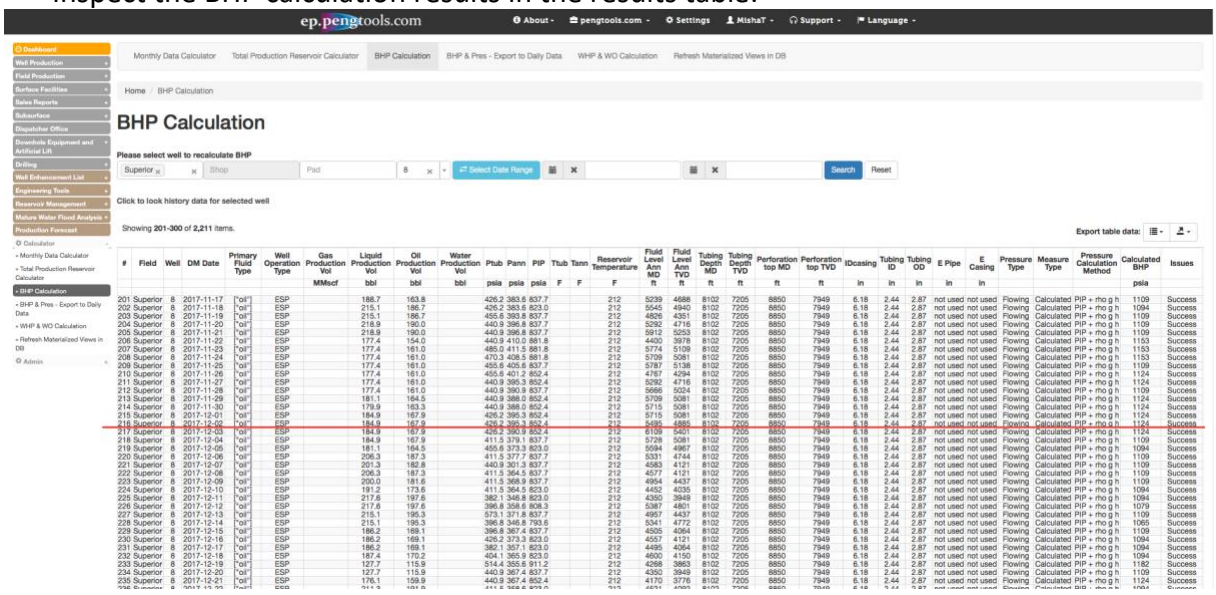


Figure 44. BHP Calculator results table in the E&P Portal

Export the calculated BHP to the daily measures.

In the left menu open the “BHP & Pres - Export to Daily Data” page of the “Calculator” module. Fill the filter as follows and click “Calculate”.

[2] Then dates filters left empty the calculator processes all the well history

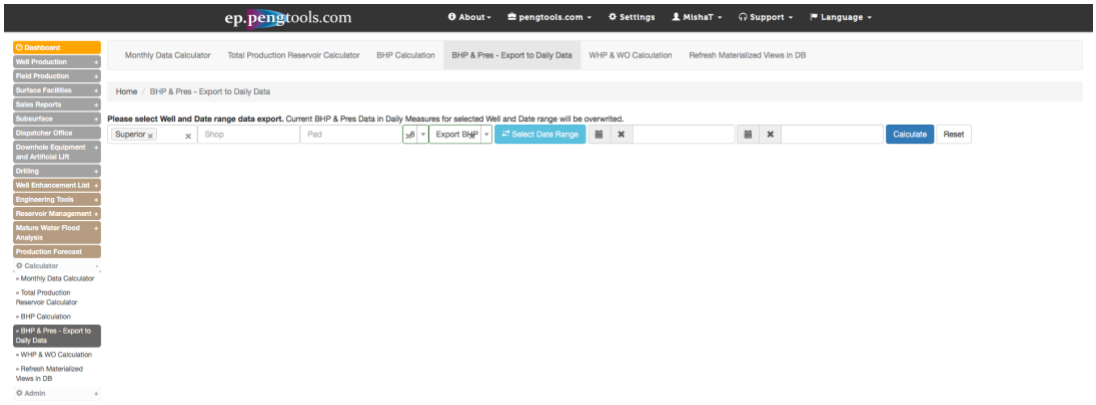


Figure 45. Export Calculated BHP to Daily Measures in the E&P Portal

Inspect the export results:

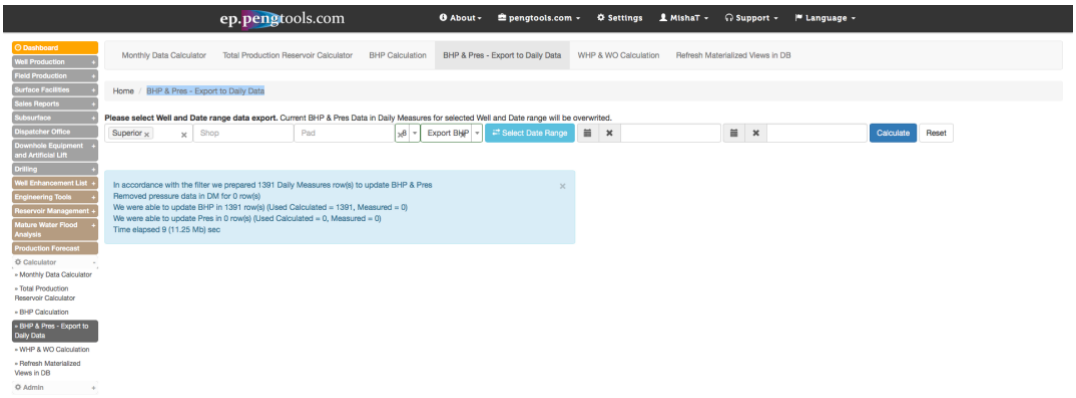


Figure 46. Calculated BHP export to Daily Measures results in the E&P Portal

In the left menu open the Daily Data Plot to visualize the calculated BHP values:

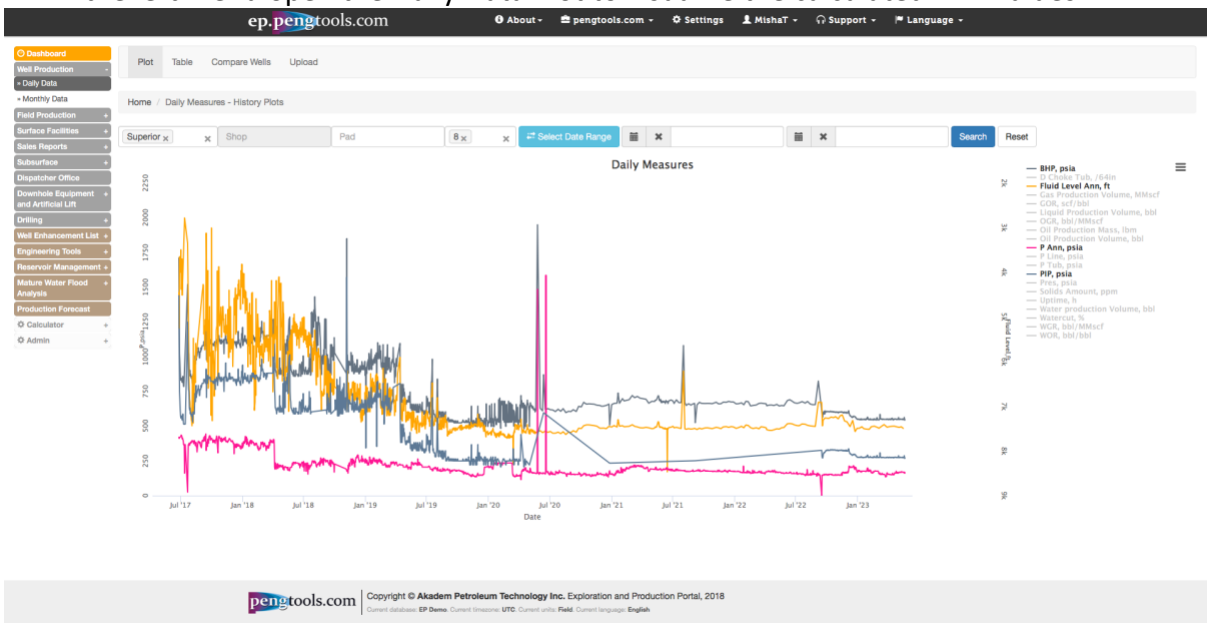


Figure 47. Well "8" Daily Data Plot with the Calculated BHP

Now you have successfully calculated the well "8" flowing bottomhole pressure in the **E&P Portal**

Applying the Oil FMB

Opening the Oil FMB tool

In the left menu open the “Oil FMB” page of the “Engineering Tools” module.

Fill the filter as follows and click “Submit”.

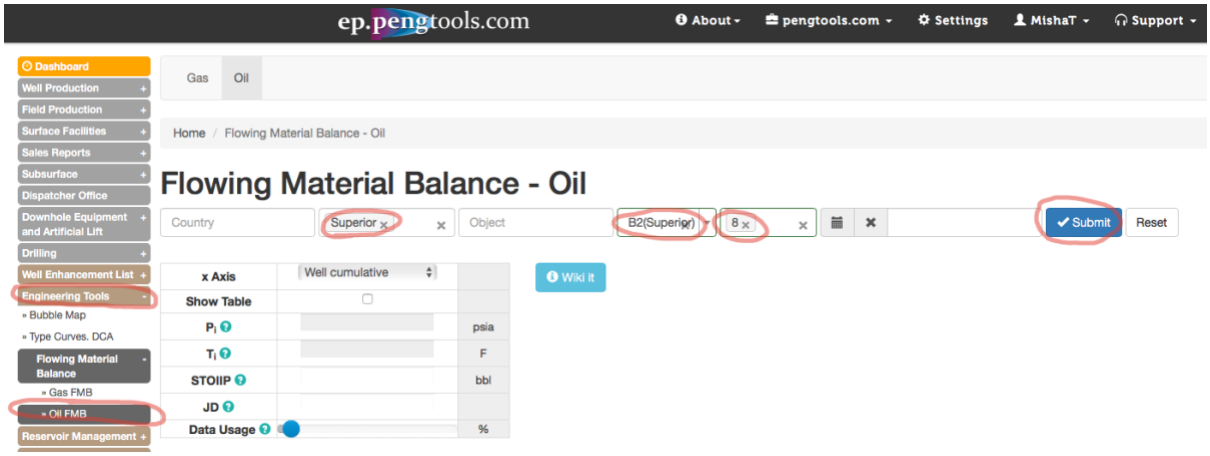


Figure 48. Oil Flowing Material Balance in the E&P Portal

Inspect the **Oil FMB** Results. Note that STOIIP and JD correspond to the input data.

Also note that oil FMB model (red and gray curves) doesn’t match the well’s data points.

This means that well “8” is draining only a part of the reservoir “B2” reserves and the post frac report **JD** of **0.6** is over estimated.

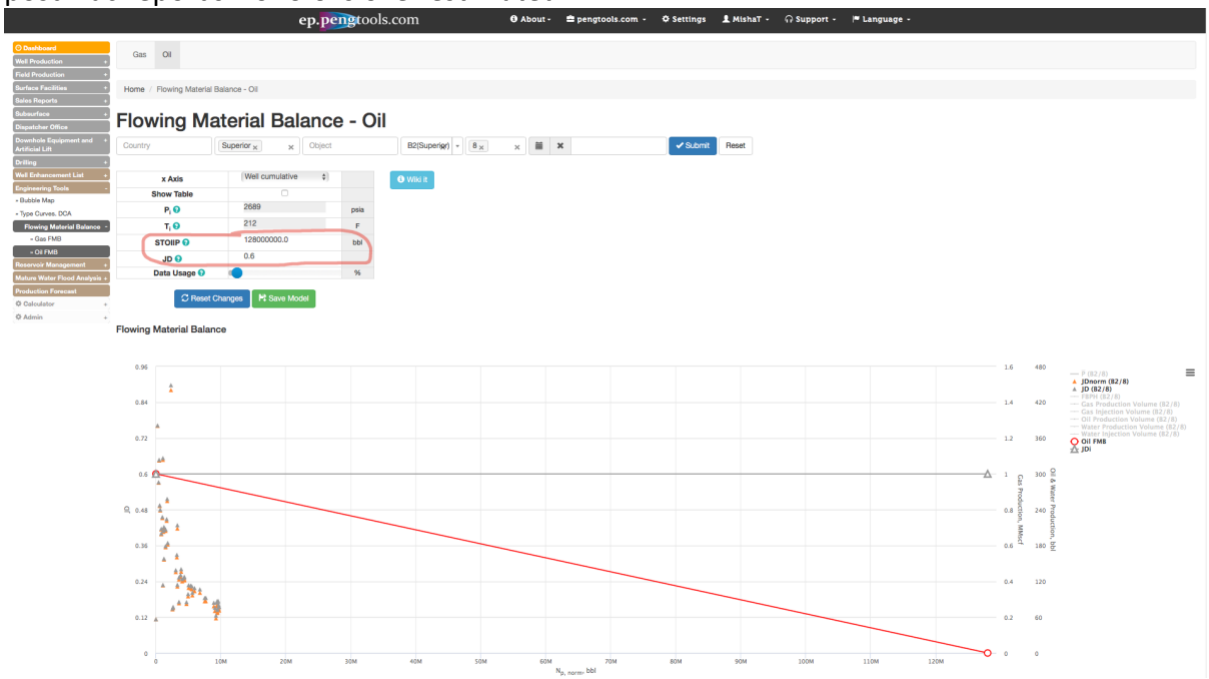


Figure 49. Well “8” Oil FMB in the E&P Portal

Now well “8” oil FMB model is ready to be matched with the well data to find the actual well’s **STOIIP** and **JD**.

Matching the well "8" Oil FMB model

To increase details

First STOIIP should be reduced. Drag and drop the red line end point to the 10M.

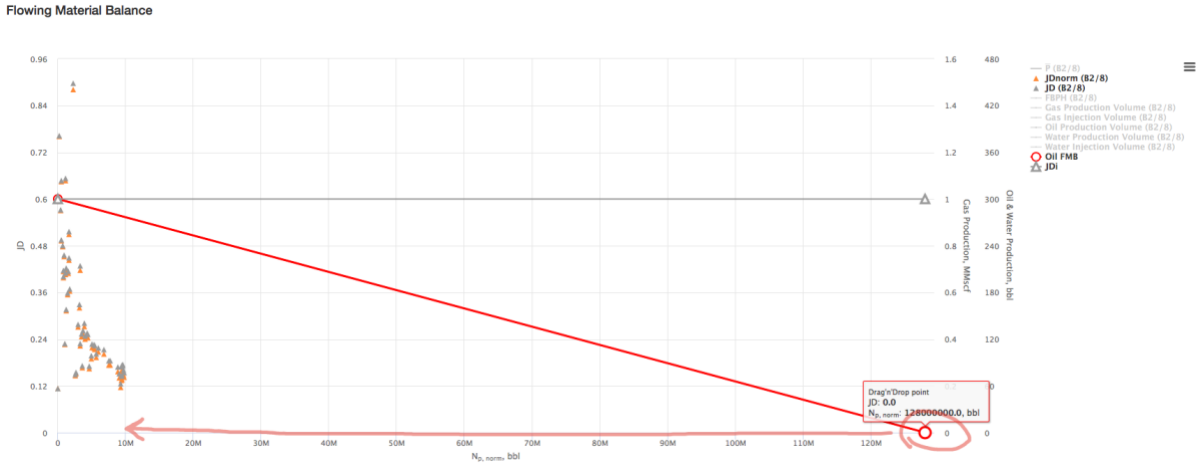


Figure 50. Well "8" Oil FMB changing the STOIIP to 10M

Inspect the Oil FMB plot with STOIIP = 10M bbl:

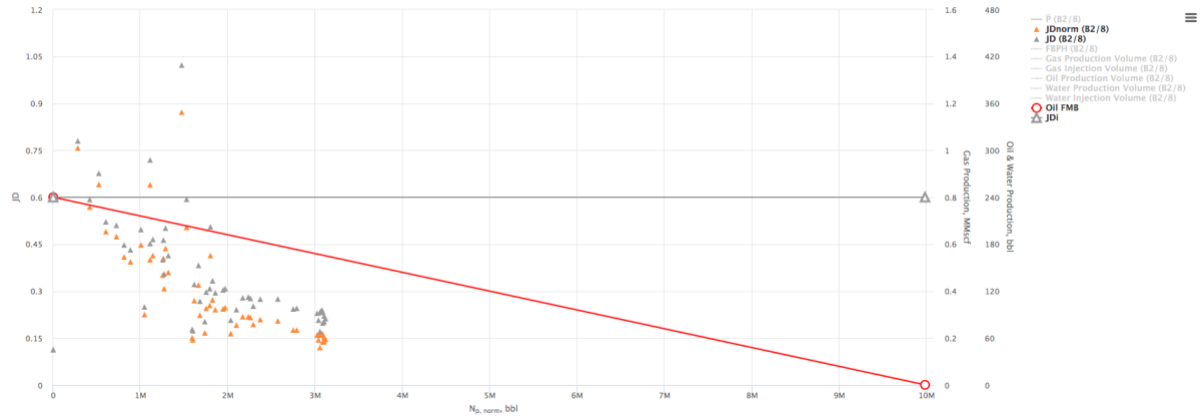


Figure 51. Well "8" Oil FMB STOIIP = 10M

At this step change the "Data Usage" to 100% in the model inputs to increase the details of the plot:

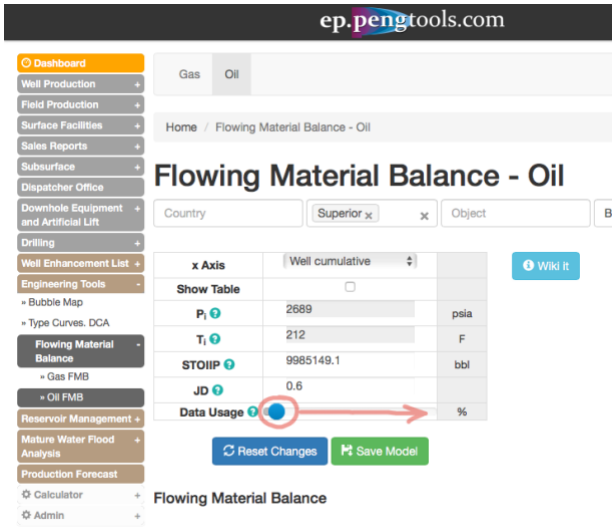


Figure 52. Changing the Data Usage of the Oil FMB plot in the E&P Portal

Inspect the Oil FMB plot with STOIIP = 10M bbl and increased data usage:

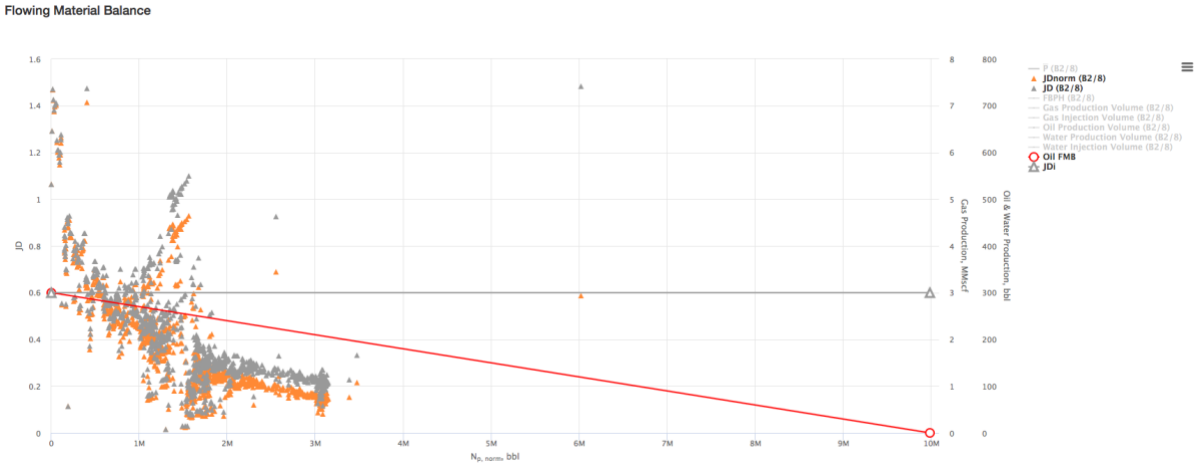


Figure 53. Well "8" Oil FMB STOIIP = 10M and data usage = 100%

STOIIP should be reduced further. Drag and drop the red line end point to the 3M.

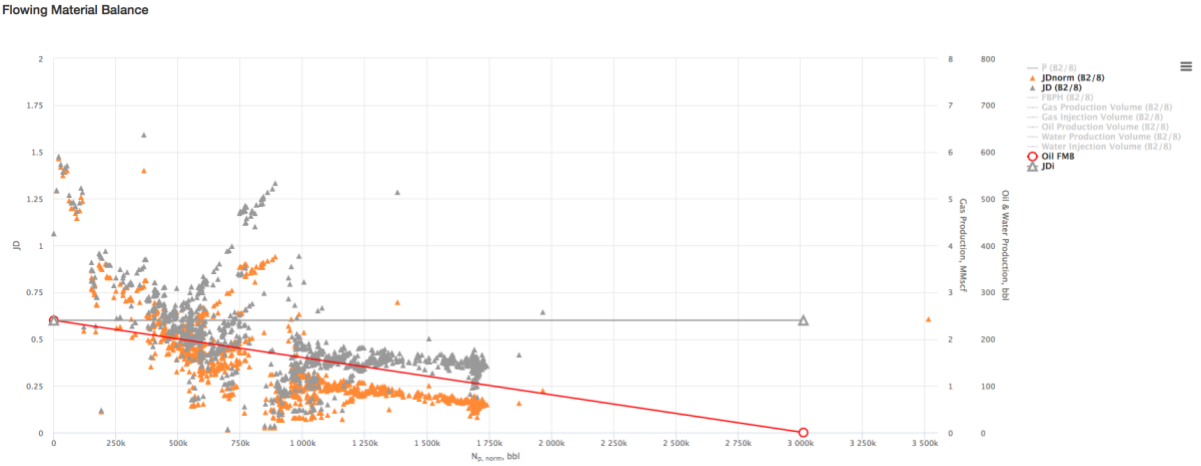


Figure 54. Well "8" Oil FMB STOIIP = 3M

STOIIP should be reduced further. Drag and drop the red line end point to the 2M.

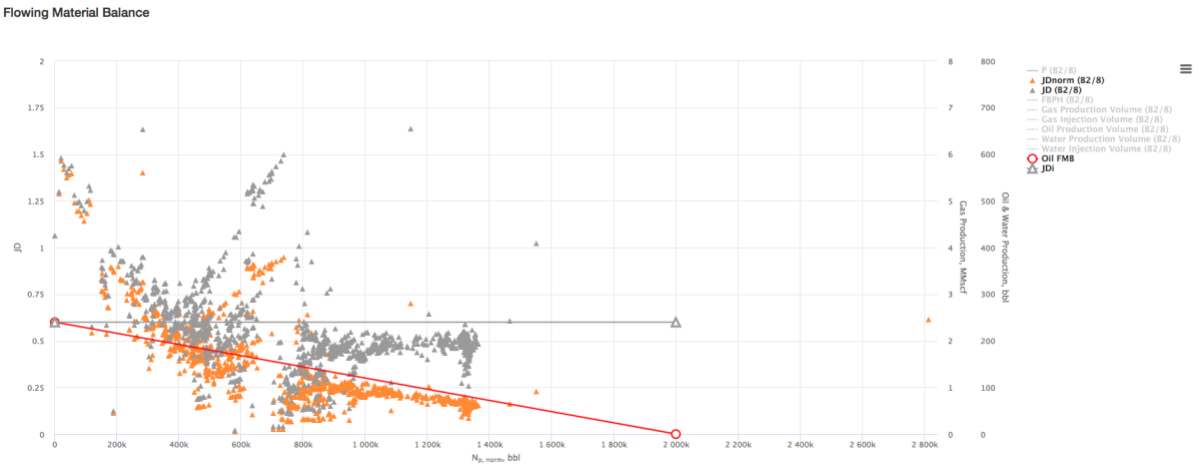


Figure 55. Well "8" Oil FMB STOIIP = 2M

Next JD should be reduced. Drag and drop the gray line end point to match the gray points:

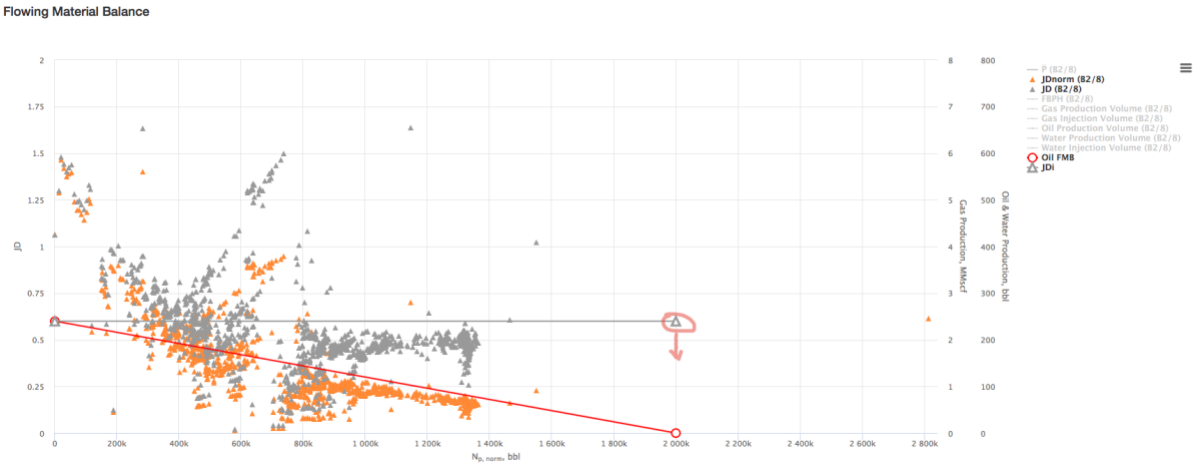


Figure 56. Well "8" Oil FMB changing the JD to 0.5

Inspect how the current Oil FMB model matches the well data:

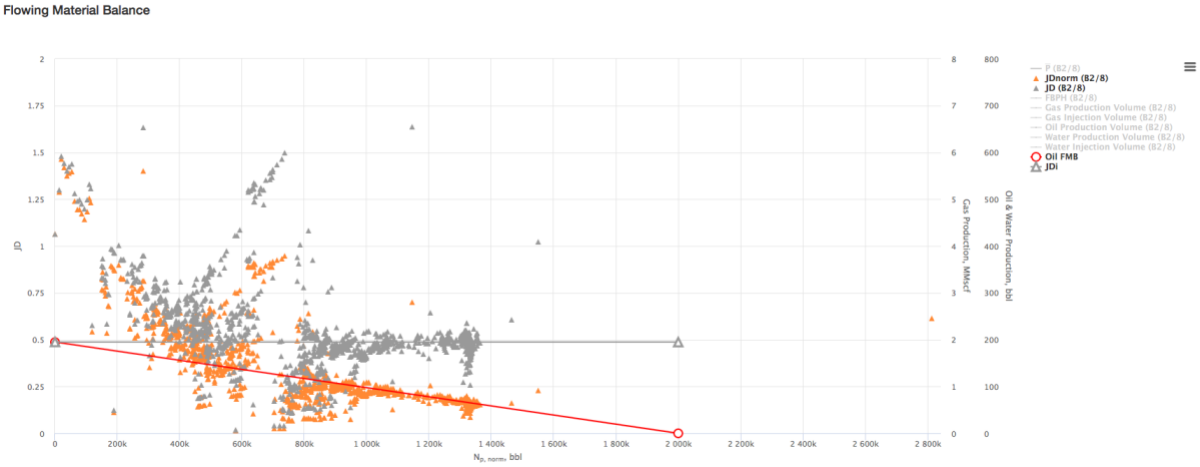


Figure 57. Well "8" Oil FMB matched model

Now well "8" oil FMB model is matched and the results are:
STOIIP = 2 mln bbl
JD = 0.5

Saving and exporting the analysis results

Saving the well “8” Oil FMB model

Click “Save Model:

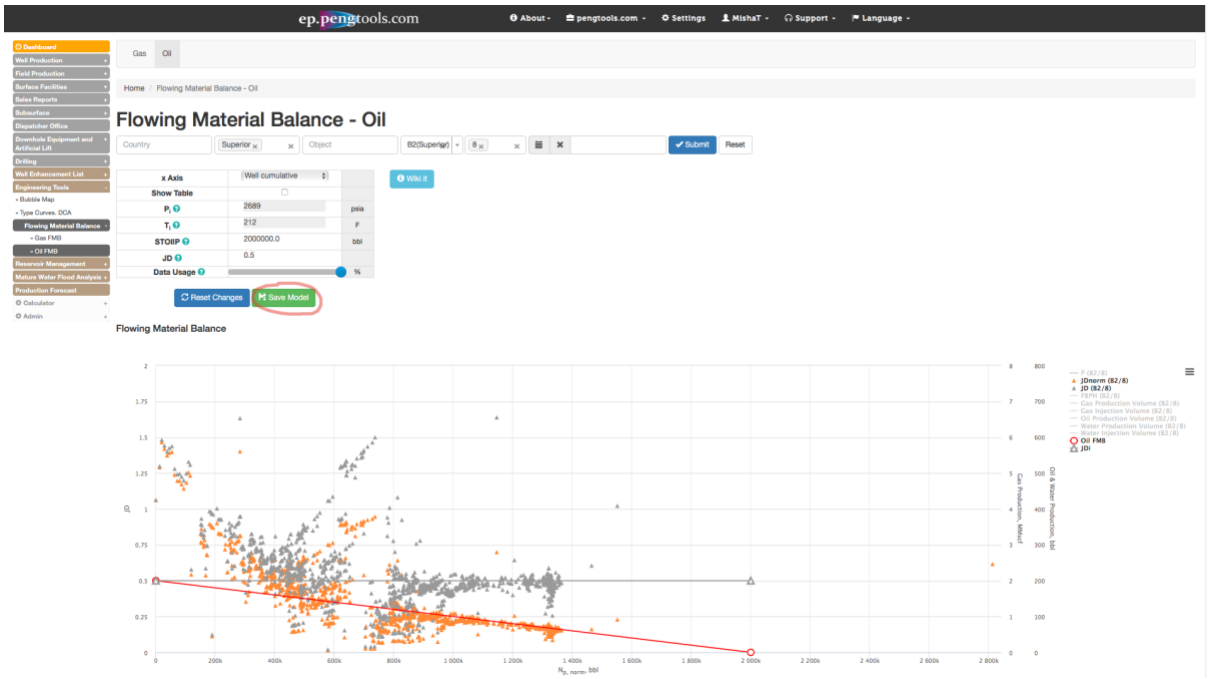


Figure 58. Saving the well “8” Oil FMB matched model

The dialog confirms that the model was saved:

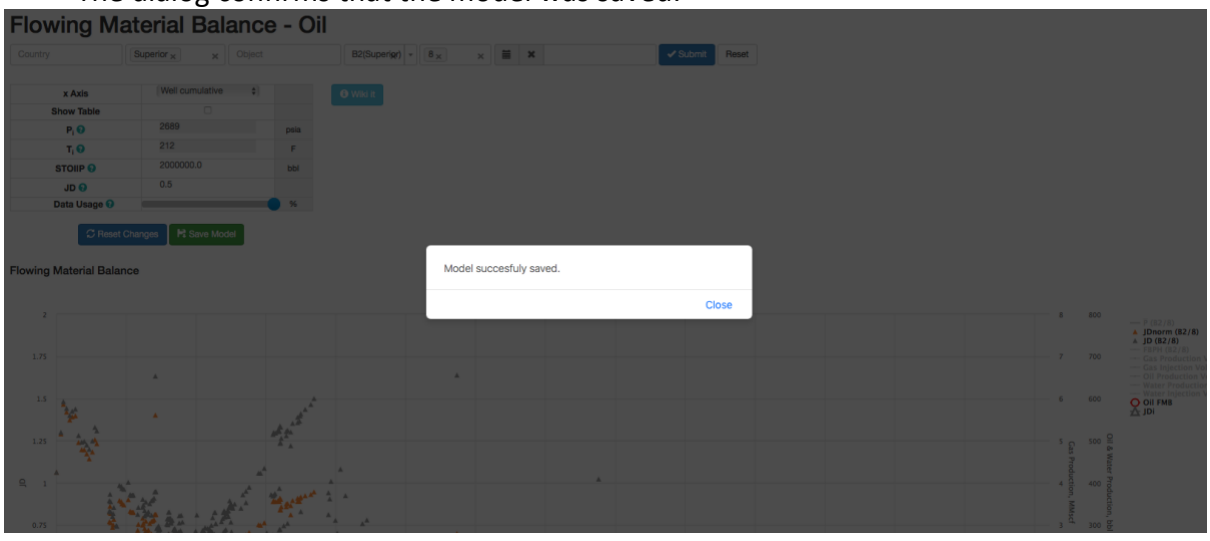


Figure 59. Saving Oil FMB model dialog

Now well “8” oil FMB model is saved to the E&P Portal database.

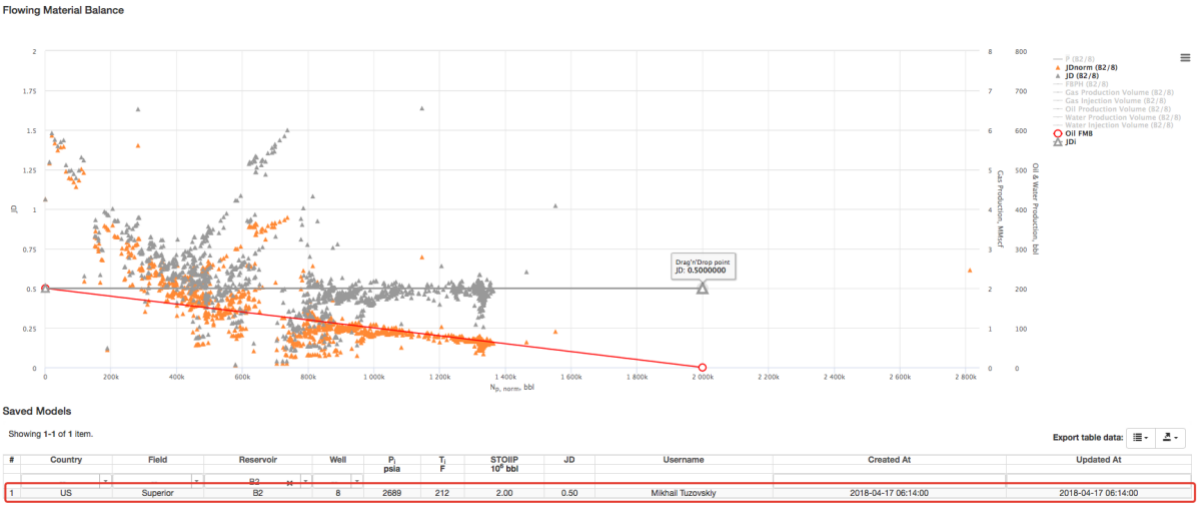


Figure 60. Saved well "8" Oil FMB model in the table

Exporting the well “8” Oil FMB model

Check the “Show Table” select box in the model inputs and click “Submit”.

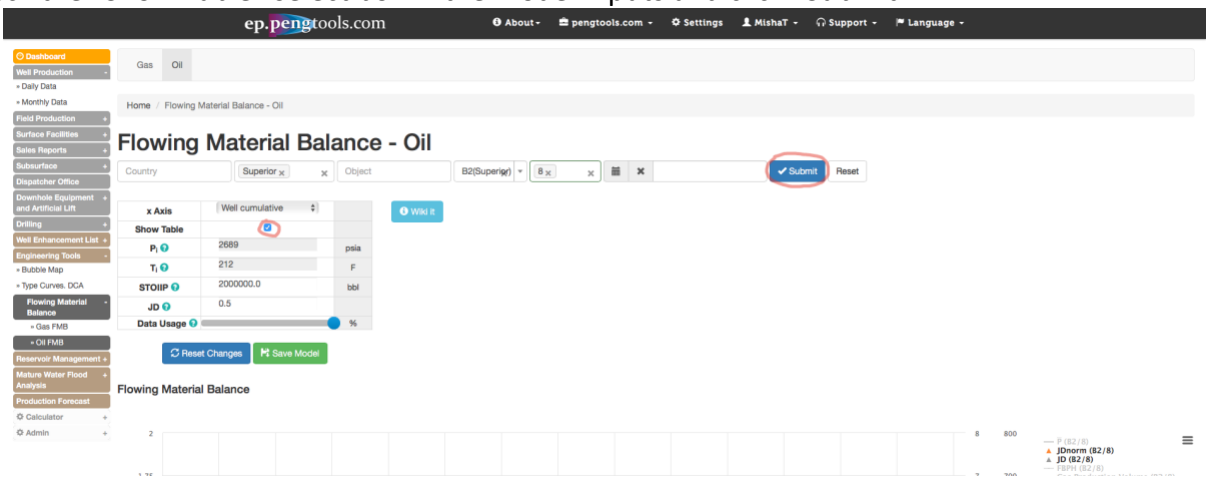


Figure 61. Selecting the Oil FMB table for output

Scroll below the main Plot to see the calculation results table:

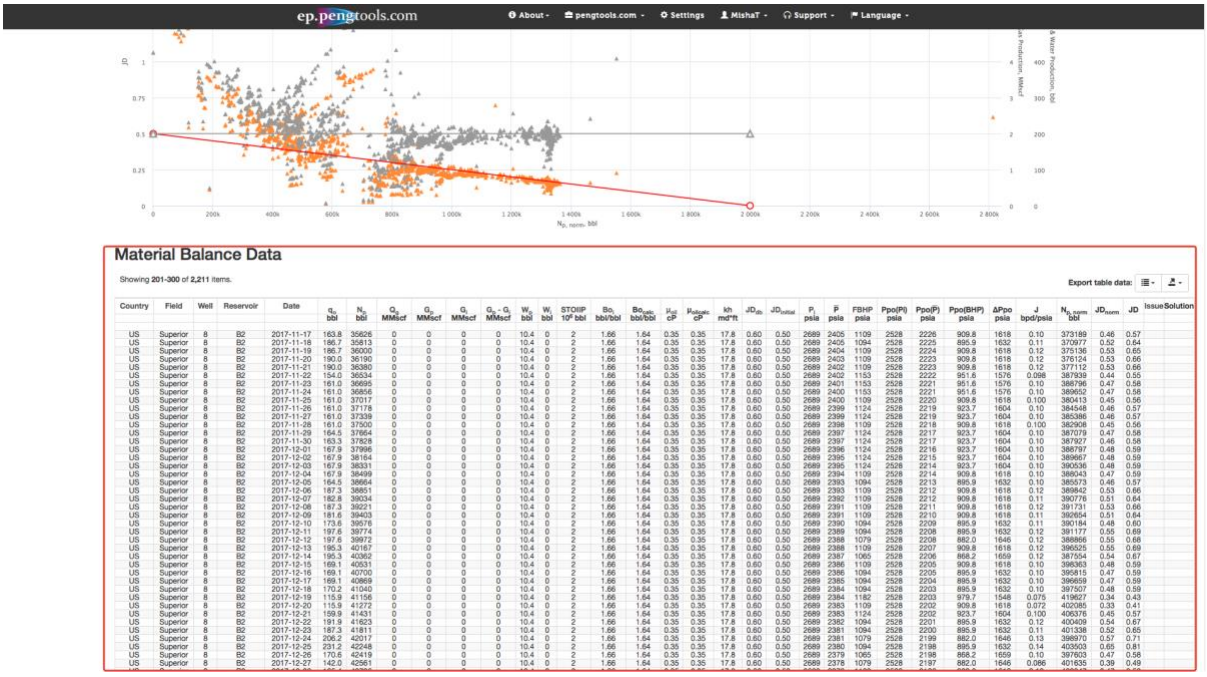
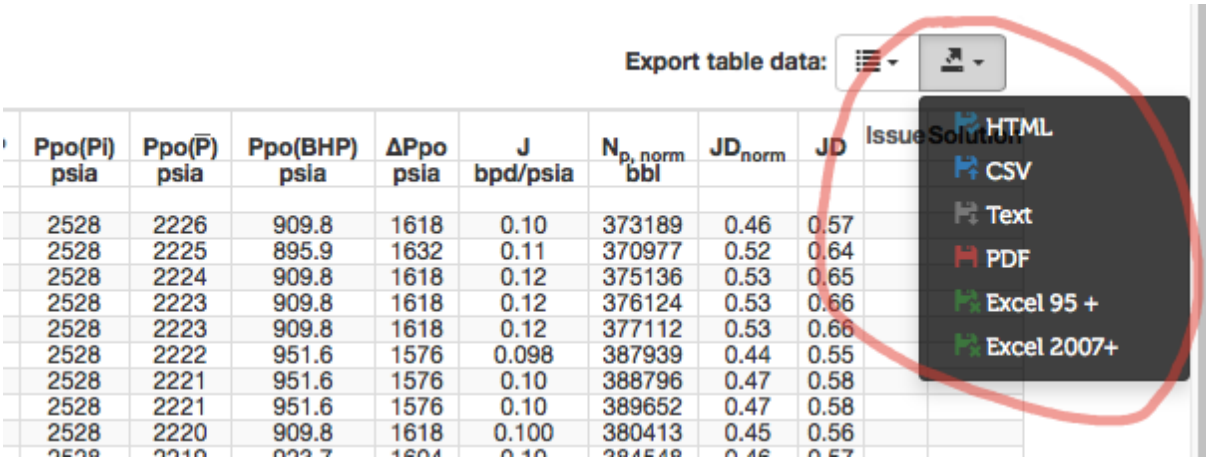


Figure 62. Oil FMB results table in the E&P Portal

Click to the export button on the top right corner of the table and select the output format you want the data in:



Ppo(Pi) psia	Ppo(P̄) psia	Ppo(BHP) psia	ΔPpo psia	J bpd/psia	$N_{p,\ norm}$ bbl	JD_{norm}	JD
2528	2226	909.8	1618	0.10	373189	0.46	0.57
2528	2225	895.9	1632	0.11	370977	0.52	0.64
2528	2224	909.8	1618	0.12	375136	0.53	0.65
2528	2223	909.8	1618	0.12	376124	0.53	0.66
2528	2223	909.8	1618	0.12	377112	0.53	0.66
2528	2222	951.6	1576	0.098	387939	0.44	0.55
2528	2221	951.6	1576	0.10	388796	0.47	0.58
2528	2221	951.6	1576	0.10	389652	0.47	0.58
2528	2220	909.8	1618	0.100	380413	0.45	0.56

Figure 63. Exporting the Oil FMB results table from the E&P Portal

Open the downloaded file “epDataExport.xlsx”:

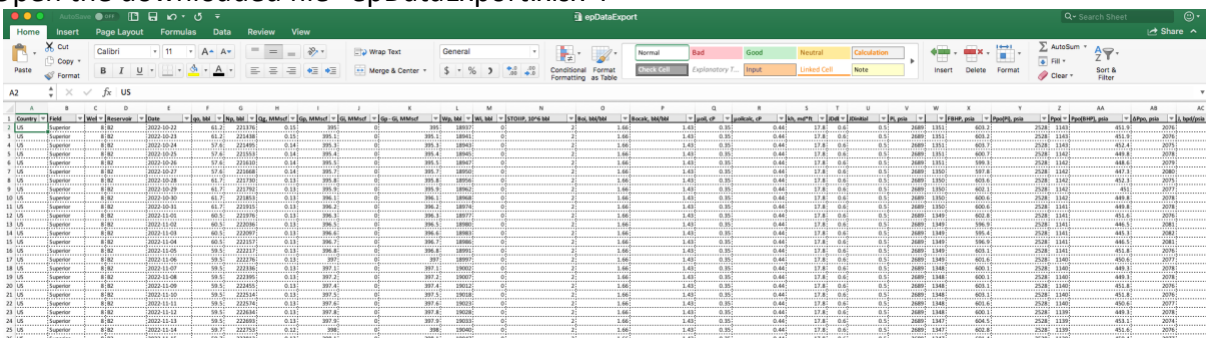


Figure 64. Exporting the Oil FMB results in Excel spreadsheet

Conclusions

This Case Study demonstrated application of the Oil Flowing Material Balance to estimate well "8" STOIIP and JD using the **E&P Portal**.

A step by step guide was presented to assist users along the way of using the **E&P Portal** and **Oil FMB** tool.

The following steps were covered:

- Input the data to the **E&P Portal**;
- Apply the **Oil FMB** to estimate the well's STOIIP and JD**;**
- Save and export the analysis results.

As usual, data preparation and upload step took the most time an effort, while the analysis part once data is processed was relatively easy and quick.

Imagine the power of the **E&P Portal** then data continually flows to the system for the hundreds and thousands of wells and ready for the analysis like the **Oil FMB** and others in the live mode!

With the help of the **E&P Portal** you can quickly analyze the big number of wells saving the engineering time while increasing the well's and field's production and company's revenues.