geoSCOUT

WHO LEFT THE WATER RUNNING?

Examining the Effect of Water Production and Infill Drilling

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Examining the Effect of Water Production and Infill Drilling

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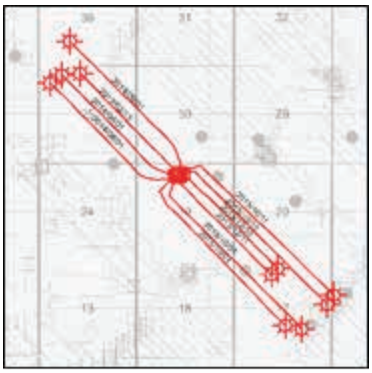
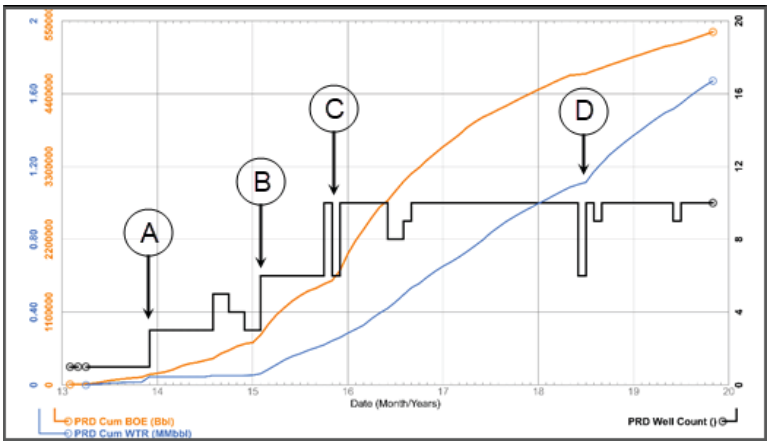
At a recent industry event, I presented an analysis case on parent-child interactions and their effect on midterm (3-5) year production forecasts. (Spoiler alert: kids can kill you!) In a casual discussion, an American colleague pointed out that he would be curious to evaluate water trends in parent-child cases as he suspected that the trends in water production do not mimic the declines most often observed in the hydrocarbon case. We have data for that, so I set out to test this theory in geoSCOUT.

Production for a Kakwa area Montney pad is shown below. The map shows on production dates along the wellbore.

There are some interesting things to note as wells are brought on. When well count went from 1 to 3 (A), the combined gas and NGL rate (here called BOE) increased, while the water rate stayed flat. Three wells were added on the NW side of this pad (B) bringing to the total well count to 6. Again, the BOE rate increased, but here, the slope of the water rate also increased. Near the end of 2015, you see the cumulative BOE production flattening out (indicating typical decline curve behaviour, whereas the water rate stays a constant slope, indicating increasing WGR (water-gas ratios) as the wells mature.





When the additional 4 wells are turned on (C), once again the BOE rate increases and then flattens as the wells produce, whereas the slope of water production stays constant. In fact, when there are some production disruptions (D), the slope of water production increases further. Is this a function of operational changes or reservoir phase changes or…?

I will be happy to report back to my colleague that his suspicion about water rates in infills appears to be valid in this case and warrants a deeper look, as well as more discussion.