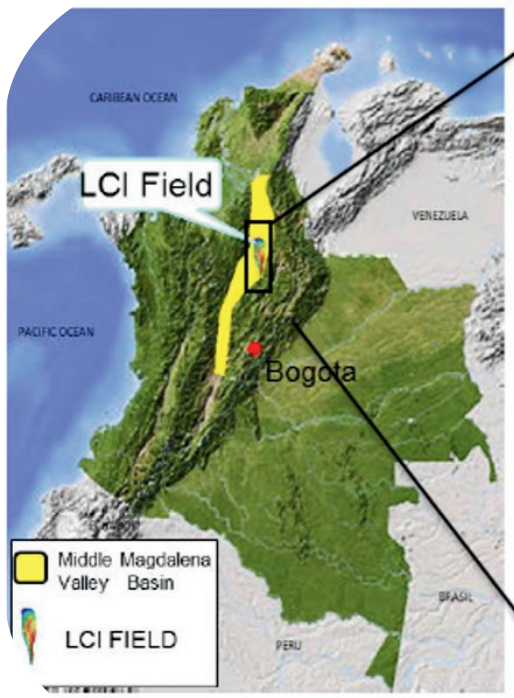
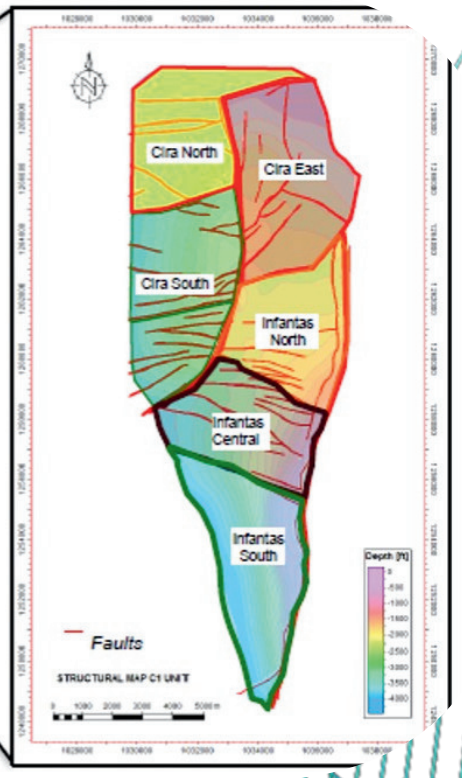
CMG | OXY

How OXY achieved a 45% boost in oil production **cutting completion costs by 30%** — at the La Cira-Infantas field in Colombia.





Swipe to see the challenge

Mature oilfields aren't running out of oil

They're running into limits of traditional thinking.

The La Cira-Infantas field in Colombia was facing classic waterflooding challenges — early water breakthrough, low sweep efficiency, and declining production - Oxy turned to advanced modeling and optimization.

Here's what they learned — and what operators everywhere can apply:

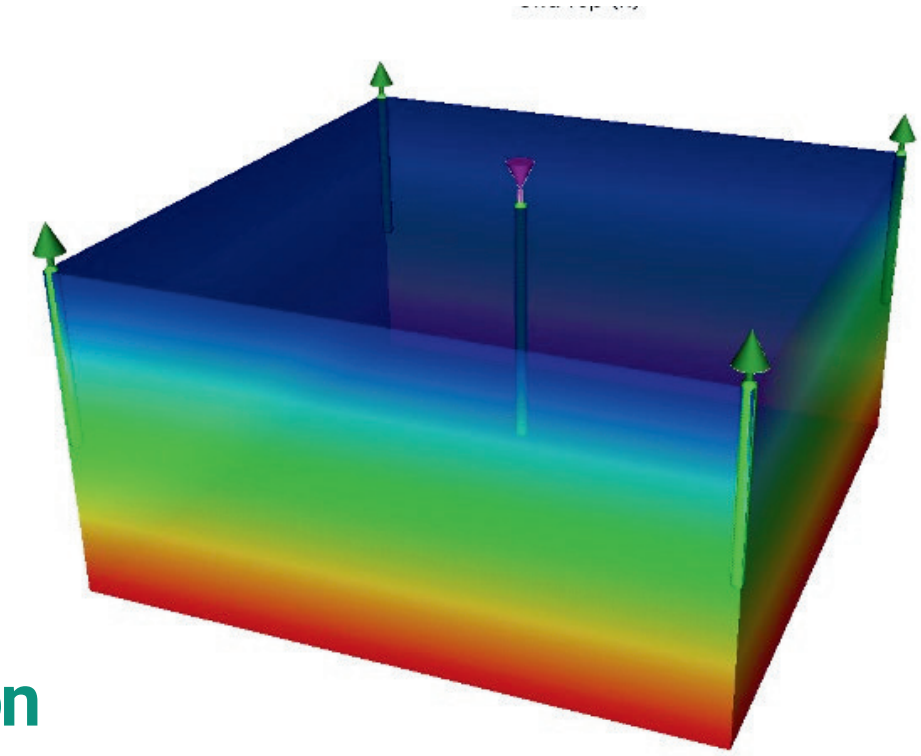


Figure 1: An example of the inverted 5-spot water flood pattern

Swipe to see the injection model

Selective injection modelling

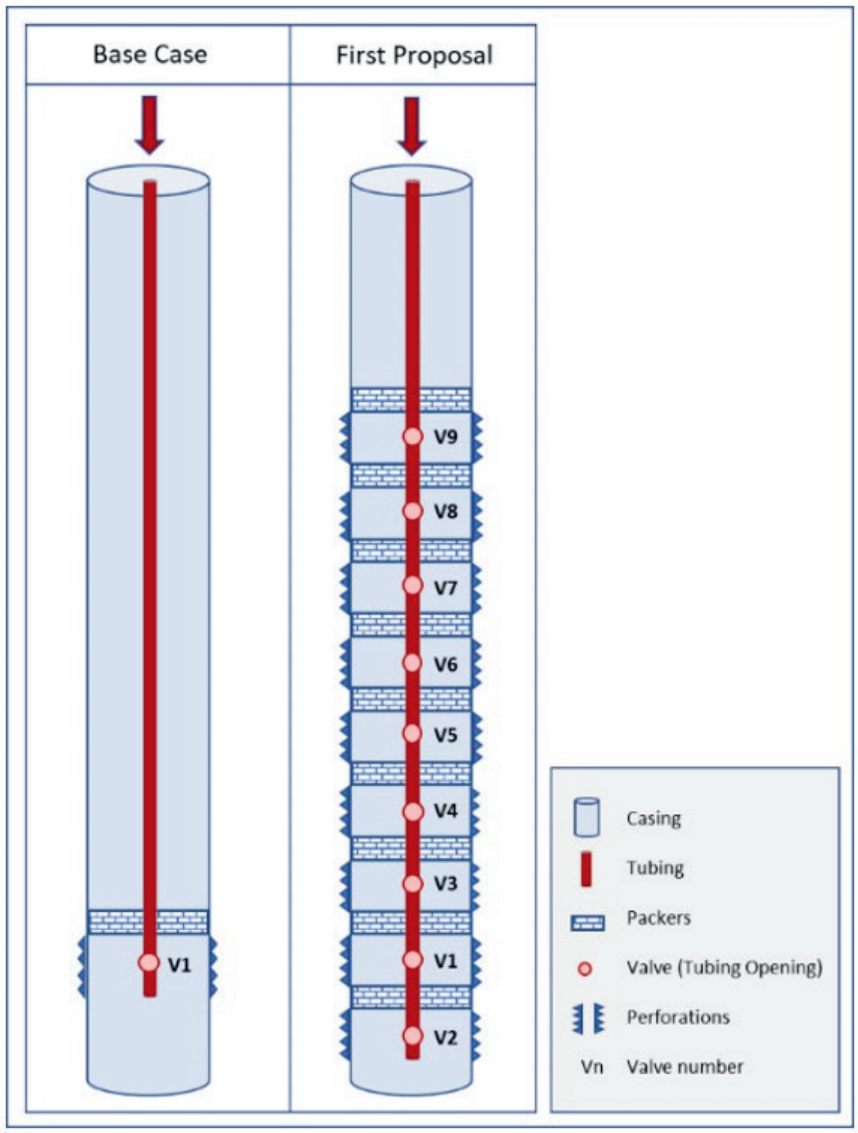


Figure 3: Water injector modeling with packers and mandrels/valves (not to scale)

The base case used a standard completion.

In the reservoir simulation, this injector was modeled using the iSegWell approach:

The injector well was designed with single tubing and nine flow control devices, modeled using a multi-segment well approach to capture flow and pressure behavior, including elements like packers and valves.

Swipe to see the solution

The solution:

CMOST was used in conjunction with IMEX to optimize the water injection strategy where two objective functions were defined to both maximize the cumulative oil production and to minimize cumulative water production from an inverted 5-spot WF pattern over 15 years. The Pareto Particle Swarm method was used to determine the optimal completion and operating strategy.

Based on the well completions proposal, the parameters to be evaluated were:

- ***Number of valves [1 to 9 valves]***
- ***Valve opening position as a fraction [0 to 1.0, where 0 is closed and 1.0 is fully open]***
- ***Water injection rate [250 to 1000 bwpd]***
- ***Bottom hole injection pressure [1000 to 3200 psi]***

CMG | OXY

See the results >>>>

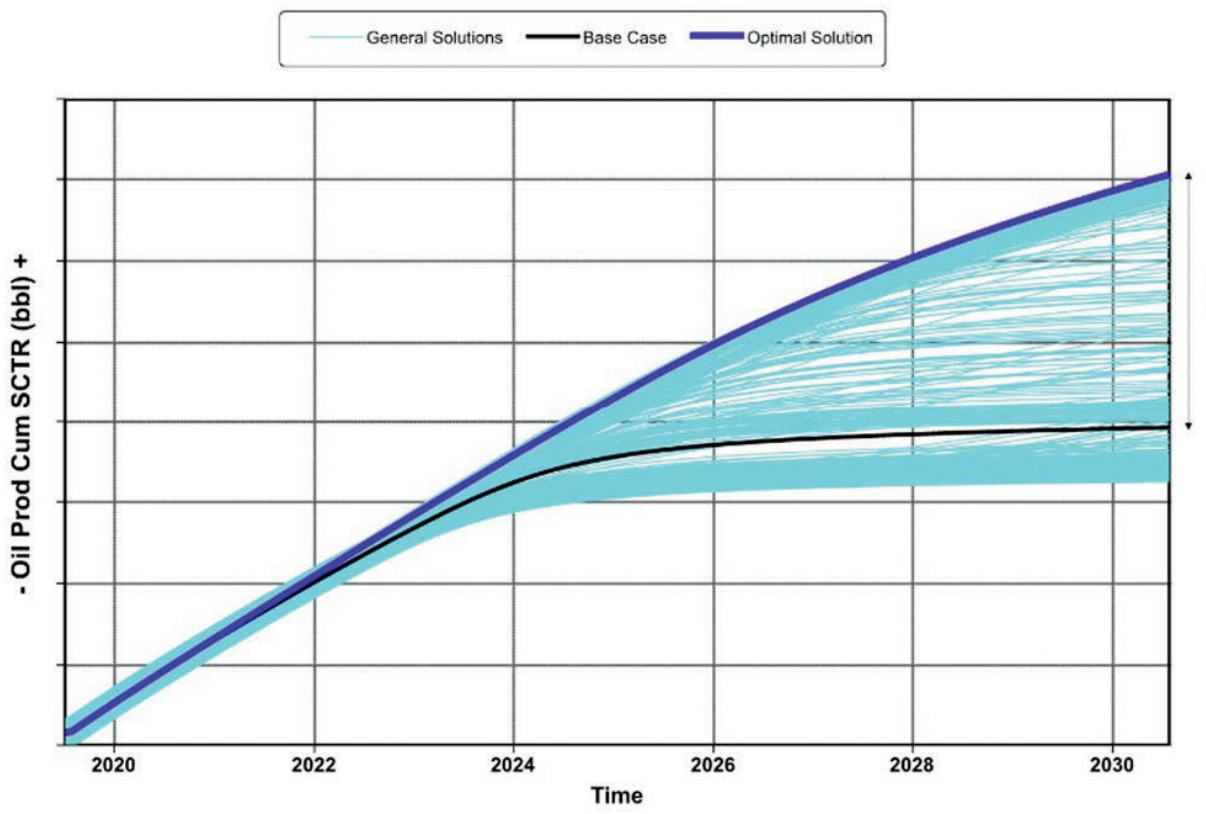
The breakthrough results:

✓ 45% increase in incremental oil production vs. base case

✓ 30% reduction in completion costs

✓ 6 valves optimized instead of the original 9 valves (saving material and time)

✓ Smarter water injection profiles that improved sweep efficiency across multiple layers



CMG | OXY