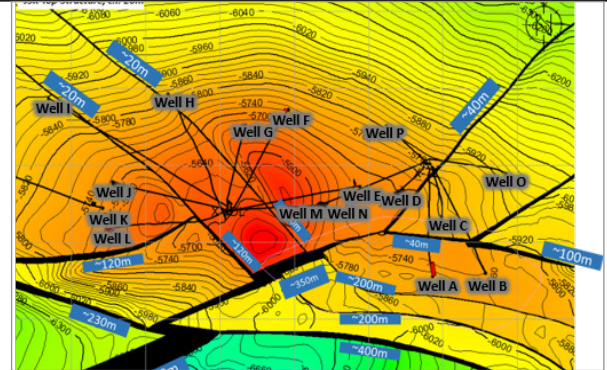


SpeedWise Reservoir Opportunity Gives New Life and Prevents Abandonment of a Mature Oil Field

RESULTS

- Within 8 weeks, SRO identified an opportunity inventory to increase production and avoid abandonment of the field. Eight weeks is considered an industry record for addressing such a complex problem.
- New zones were found where the company didn't believe there was any remaining oil.



Structure map of the reservoir shows several major fault blocks within an anticline.

APPLICATIONS

SpeedWise® Reservoir Opportunity*

CUSTOMER

Major oil and gas company operating in the Gulf of Mexico

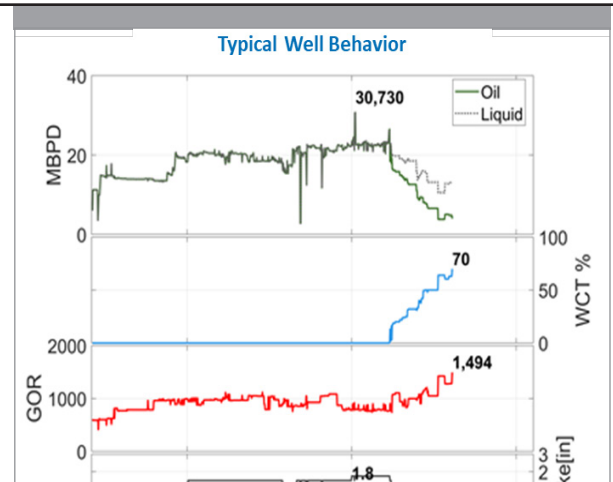
CHALLENGE

The asset is a complex, highly fractured, mature oil field with over 20 years of production history. Over the past two years, oil production dropped almost 80% (from peak production of 120 MSTB/D to 25 MSTB/D), mostly due to rapid water encroachment that resulted in well shutoffs. A typical well was producing oil between 20 MSTB/D and 30 MSTB/D with no water many years after commission. However, after the water breakthrough, oil production dropped by more than 90% in less than six months. It took the asset team more than a year to build and calibrate a traditional reservoir simulation model to understand water behavior in the field and optimize the development plan.

Despite all the effort, none of the models accurately predicted water behavior, due to a poor understanding of the fracture network and the limitations of conventional dual-porosity and dual-permeability finite difference models. As a result, the asset team had no choice but to write off 1P reserves by 90%, and there was no planned activity beyond operating the eight active producers.

SOLUTION

The asset team turned to SpeedWise Reservoir Opportunity technology to maximize the value of the asset before abandonment. The focus was on looking for a) workover candidates in existing wells to mitigate water encroachment, and b) sweet spots in the attic oil structure between the



Production of a typical well shows a rapid decline in oil production and an increase in water in the past couple years.

Due to the fractured nature of this reservoir, it was suggested to use the drainage method "Rate Proxy" for this and similar reservoirs with secondary porosity and permeability.

*US Patent Pending

water cones to maximize the standoff from water-oil contact, accessed by highly deviated wells to maximize reservoir contact. One of the key challenges was the poor understanding of the current water-oil contact.

SRO was able to integrate the results of an ensemble of dynamic reservoir models that resulted in a range of possible interpretations of the current water-oil contact. This is due to the workflow's flexibility, allowing it incorporate simulation models when they are available. Furthermore, the workflow's ability to manage different branches of a dataset and then run rapid and consistent evaluations on each resulted in a range of opportunity inventories. Therefore, SRO not only uncovered the remaining potential by incorporating the dynamic data, it helped manage risks by evaluating multiple scenarios.

RESULTS

Within eight weeks, SRO identified an opportunity inventory to increase production and avoid abandonment of the field. The base scenarios consisted of 11 technically and economically feasible prospects, including eight workovers (plug-backs and choke optimization in existing wells) and three highly deviated targets.

BENEFITS

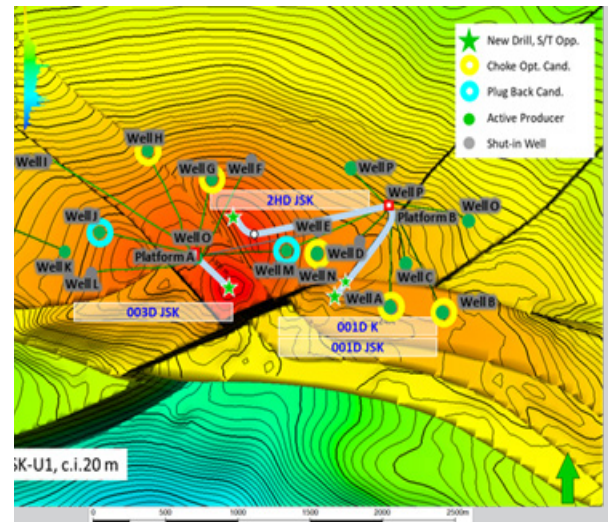
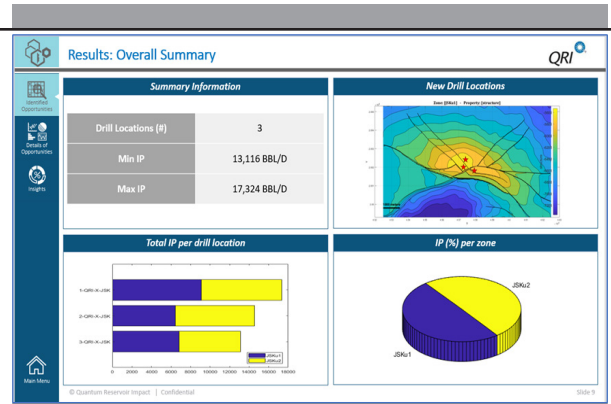
The incremental recovery for the base scenarios was estimated between 9.4 (low estimate) to 25 (high estimate) MMBO.

The complete process of identifying and ranking the candidates only took eight weeks - which is considered an industry record for addressing such a complex problem - and the unlocked potential gave new life to the field where no alternative solution was available.

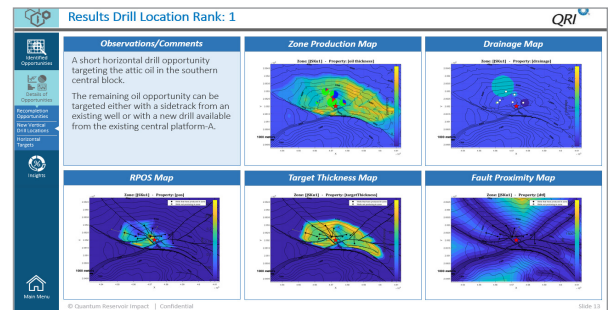
	Previous Workflow	SRO
Completion Time	12 months	8 weeks
Person Months Spent	30 months	16 weeks
# of Scenarios	None	6 cases

Emerson Automation Solutions
 6005 Rogerdale Road
 Houston, TX, 77072
 Tel. 281-879-2300

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SRO identified untapped oil opportunity near the crest of the anticline in 3 separate fault blocks (top). Upon further review, the asset team decided to target them as deviated/highly deviated wells from an existing platform (bottom).



Example of SRO-generated maps to evaluate an infill drill location.