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Reservoir Characterization for Field Rejuvenation—a Case Study

At the state oil company of Trinidad and Tobago, (PETROTRIN), and its predecessor companies, field rejuvenation has evolved through time from single well targets to the more highly detailed and complex field reservoir characterization study recently completed. This method had been used successfully in several basins around the world. Applications in the fluvial-deltaic reservoirs in eastern Venezuela suggested its potential for PETROTRIN's mature onshore fields.

This detailed Reservoir Characterization required an integrative and iterative process involving geologists, geophysicists, engineers, and petrophysicists. The Parrylands field was selected from a list of seven potential fields after evaluation by a team of engineers and geologists. This field is one of the most mature fields on land from which production began in 1913. Criteria for selection included; reserve growth potential, field extension potential, geologic risk, and adequacy of field infrastructure.

There was a significant challenge posed due to the lack of log and production data from the early wells drilled in the project area. This combined with paucity of core analyses required a more thorough attention to the data that was available in order to unravel the structure and stratigraphy. Despite these hurdles the detailed reservoir characterization process was shown to be applicable to this 90-year-old field. Over forty new drilling prospects were identified with a potential of increasing existing field reserves by 200 %. Results of the first phase of the subsequent drilling campaign validated the methodology and demonstrated concurrence between pre-drill and post-drill parameters. This early success has led PETROTRIN to embark on another reservoir characterization study.