

Steam And Glean: Planning To Learn in A Potential World-Class Heavy Oil Project

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The Tsimiroro field is an onshore heavy oil asset (mean resource nearing 4 billion barrels @14API), located onshore Madagascar. The project is in the early assessment and resource identification phase on the brink of steam flood pilot implementation. As such, adequate interpretation and treatment of existing subsurface data is crucial to determining the optimal path to maximize the value of the field. In addition to resource uncertainties, there are substantial variables related to above-ground risk and operational decisions, including processing, transportation, and marketing of the product. While important for any project, these aspects become critical for this, the first commercial project of a non oil producing country.

Subsurface and operational risks, as well as critical project objectives/decisions for this large-scale steam flood project, were approached using industry leading probabilistic methods, capable of testing pathways through highly complex situations. The evaluation is expanded to deal with the full value-chain of the steam flood project. This process, rooted in statistics and decision theory, helps determine the most significant value drivers and sheds light on what can be done to reduce uncertainty. It identifies and prioritizes risk mitigation measures leading to a better expected value for the asset.

Subsurface work shows resource packages ranging in size from 900 million to 1.6 billion barrels. Evaluation of OOIP indicates that further delineation of the field via drilling and Electrical Resistance Tomography will resolve significant uncertainty. A pilot program designed to focus on critical learnings will help to de-risk many of the important project variables at a relatively low cost - an insight which could not be gleaned from a traditional deterministic analysis. The process is durable. Future decisions on export transport methods, oil upgrade, and commercial aspects can be efficiently evaluated in context.

Conventional oil horizons continue to diminish and many oil companies are shifting their focus to secondary recovery and unconventional methods. As such, complex production alternatives, such as heavy oil steam flood projects applied in new areas, are becoming a larger part of company portfolios. This case study provides a helpful analogue for comparison, as well as highlighting a robust process for evaluating assets and development strategies.