Framework of the Monterey Resource Play – San Joaquin Basin, CA

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Abstract

During the period of 2010-2014, Aera Energy LLC tested the Monterey Resource Play with three hydraulically fractured horizontal wells in the southern San Joaquin Basin of California. Aera started by comparing the major hydrocarbon generating areas of California to the oil resource plays that were developing at the time in the Mid-continent of the United States.

A regional geological studies team focused the potential opportunities into the mature source rock area of the southern San Joaquin Basin. The team then generated detailed play segment maps combining basin model realizations with rock properties and other parameters into common risk segments. The maps focused the de-risking plan and leasing activity. Resource, analog and economic evaluations demonstrated the potential opportunity for drilling horizontal wells directly into the organic-rich sections of the Monterey. The recovery method was predetermined to be a hydraulic fracture stimulation completion based on the success of mid-continent analogs. Aera Energy had a dominant acreage position around its Belridge production complex but needed to increase acreage positions east of Lost Hills to develop materiality and leverage. Prospect details and risks were evaluated by the team while an economic model was developed to help assess alternative development and strategic scenarios. Since success can never be determined with a single well, a robust decision process was developed to identify key decisions and potential off ramps to minimize risk while maximizing value.

A strategy was developed to educate the public and key stakeholders in preparation for a success case comprising large-scale horizontal development. Aera then executed a three well drilling campaign targeting two separate zones in two sub-basins of the San Joaquin Valley. Vertical wells were first drilled in which geochemical, downhole logs and rock property data were collected to identify the optimum zone for horizontal well placement. Decision criteria were agreed to ahead of time so that the same drilling rig could be used to drill a 5,000 ft. lateral with no down time awaiting decisions. A separate technical team developed an appraisal and piloting plan integrating geology, EHS factors, land, and capital strategy for the success case while the exploration wells were being drilled. A six-month production test was executed in each lateral well and translated to estimated ultimate recoveries based on analog data. Although production was established, none of the three wells passed the economic threshold so the first exit ramp was taken with a decision to cease the Monterey unconventional exploration program.

The Monterey resource play requires further evaluation and refinement of drilling and completion techniques for an economic play to develop. Additional options include acid stimulation, testing different target zones, changing the lateral direction and length. Cost improvements are also needed due to the 12,000-15,000’ depth range.