

Definition of Assessment Units and Methodology for Assessment of Undiscovered Resources in a Well-Explored Basin

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The U.S. Geological Survey (USGS) recently completed an assessment of the undiscovered oil and gas potential of the San Joaquin Basin. The assessment is based on the geologic elements of each Total Petroleum System (TPS) defined in the province, including hydrocarbon source rocks, reservoir rocks, and traps. Using this geologic framework, the USGS defined five TPSs and quantitatively estimated the undiscovered oil, gas, and natural gas liquid resources of ten assessment units. The assessment units are: 1) Northern nonassociated gas, 2) Deep fractured pre-Monterey reservoirs of the west side, 3) Eocene-sourced rocks of the west-side fold belt, 4) Eocene rocks north and east of the west-side fold belt, 5) Southeast stable shelf, 6) Lower Bakersfield Arch, 7) Miocene west-side fold belt, 8) South of White Wolf Fault, 9) Monterey diagenetic traps of the central San Joaquin Basin, and 10) Neogene nonassociated gas. The assessments were conducted probabilistically, integrating geological information from each assessment unit with the history of exploratory and development drilling and production. Results are presented as a probability distribution of undiscovered resource volumes, along with estimated sizes, numbers, and field size distribution.