

## **Is Hydraulic Fracturing Necessary?**

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### **Abstract**

Examination of well logs, cores and completion reports for California basins containing Miocene shales indicate predictable patterns of rock-fluid mechanics. Wells deeper than 6,000 feet typically have high initial production rates which quickly water out, become uneconomic, and are abandoned. Thousands of them have been drilled and abandoned, and hundreds are added to that abandoned inventory every year. Because most Miocene basins are over-pressured, the deeper shales behave plastically. The fractures in them “breathe” as pressures are increased and decreased when wells are cyclically shut in and later returned to production. The implication is that there are plenty of naturally occurring fractures in these Miocene shales to sustain production. Hydraulic fracturing is not necessary, if sufficient time is permitted for fractures to enlarge enough for porosity and permeability to be restored to the formation surrounding the well bore.