

## **Geologic Architecture & Potential of the Lower Atoka, (Mississippian), Midland Basin**

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### **Abstract**

The Lower Atoka (likely Mississippian age) was a hot play in the 1970's and 1980's during the discovery and exploitation of the Lowe, Moonlight and Bradford Ranch fields. In the last ten years the vertical Wolfberry play continued to include deeper horizons like the Lower Atoka pays, providing wells with some extra production of high quality oil and gas. Only in the last couple years have a few operators targeted this horizon with horizontal wells, discovering additional drilling challenges due to the higher pressures and overlying clay-rich shales.

Lower Atoka sediments were shed into the Midland Basin as clastic and carbonate debris flows and turbidites, form-in three large fan complexes on the basin floor. These complexes comprise the main reservoir targets for the Lowe, Moonlight and Bradford Ranch producing areas. These reservoir bodies are encased in shale on the basin floor, providing the perfect hydrocarbon trap for the Lower Atoka reservoirs. These fields produce high gravity volatile oil, minimal water, and are characterized by high pressure. It is unclear whether this is a self-sourced interval or being sourced from the underlying Barnett or Woodford shales. The heart of these complexes has been exploited with vertical wells. An opportunity still exists within these fans utilizing modern horizontal and frack technology.