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The Late Jurassic Alpine C Sandstone - A Bioturbated, Paralic Reservoir Deposited During a Slow Transgression: North Slope, Alaska

The 429 mmbbo Alpine Field produces from the basal Alpine A, an upward-coarsening shoreface succession of fine- to very fine-grained, well-sorted sandstone to muddy siltstone, and the Alpine C, a well-sorted, fine-grained glauconitic sandstone. An unconformity separates the Alpine A and C sandstones. The reservoir sandstones exhibit an archetypal to proximal *Cruziana* ichnofacies; however, distinct assemblages of traces delineate the A and C units. Most of the reserves occur in the Alpine C sandstone, however reservoir quality and thickness vary fieldwide.

The reservoir and trap originated through marine and terrestrial erosion, *in situ* sediment winnowing, aggradational filling of antecedent topography, and burial by marine shale. During the Late Jurassic, a low-gradient coastal plain with an east-west oriented coastline (Alpine A) extended from north-to-south on Alaska's North Slope. A relative sea level fall accelerated coastal plain erosion and established a lowstand shoreline basinward. Seismic mapping and wireline-log correlations reveal irregular topography created on the coastal-plain by fluvial and tidal erosion (relief exceeds 100 ft; 33 m). A *Glossifungites* ichnofacies denotes this marine and terrestrially modified unconformity.

Marine processes reworked Alpine A sediments during a slowly rising sea level to form a retrogradational barrier-island coast. Well-sorted, fine-grained, sandstones deposited in barrier-island, tidal-inlet/spit, and bay environments overlapped this unconformity and aggradationally filled the Alpine A topography to form the Alpine C reservoir. Complete transgression is recorded by a transgressive-surface of erosion that truncates the Alpine C. A fiddle marine shale seals the reservoir.