

Outcrops Of Deep-Water Facies Of The Cobblestone Sandstone of the Fortress Mountain Formation, Central North Slope, Alaska: Possible Analogs for Reservoirs in the Foredeep of the Colville Basin

C.J. Schenk and D.W. Houseknecht

U.S. Geological Survey

MS 939, Box 25046, Denver, Colorado, 80225 USA

The Foothills area of the Alaskan North Slope is underexplored compared with other areas such as the Barrow Arch. The presence of adequate reservoir rock in the Foothills is a significant geologic uncertainty. Outcrops of the Aptian (?) informally named Cobblestone sandstone of the Fortress Mountain Formation described from several locations indicate that potential reservoir rocks might be present in the foredeep of the Colville Basin. Four main deep-water clastic facies have been identified in outcrop: 1) solitary to amalgamated apparent massive sandstones from 0.2 to 4 m thick with a variety of subtle textures and structures; 2) texturally organized to disorganized conglomerate and very coarse-grained sandstones; 3) fine-grained sandstones exhibiting grading, parallel and ripple lamination, and fluid escape structures; and 4) laminated siltstones and mudstones. Facies 1 sandstones are commonly oil-bearing in outcrop, and primarily represent deposition from high-density sediment gravity flows in frontal splays or lobes. One 130-m-thick section contains six depositional units with upward-thickening massive sandstones. Facies 2 represents proximal to distal channel deposits; disorganized textures are interpreted as having formed by debris flows. Facies 3 represents deposits from low-density sediment gravity flows, and are mainly proximal overbank and crevasse splay deposits. Facies 4 represents more distal overbank deposition. Facies 1 and 2 are interpreted as the main potential hydrocarbon reservoirs, and might be significant exploration targets in the Foothills of the Alaskan North Slope.