Sterling Field, Upper Beluga Undefined Gas Pool

Pool Summary

This undefined pool produced regularly from one well, Sterling Unit No. 32-09, between December 2004 and May 2010. It has been shut in since June 2010.[1]

Geology

At Beluga Formation level, the Sterling Field structure consists of a broad anticline that trends northwest and lies about 7 miles east-southeast of the City of Kenai. The flanks of the anticline dip with a slope of about 100 to 130 feet per mile (about 1° to 1-1/2°).

In the Sterling Field area, the Miocene-aged[2] Beluga Formation is composed of interbedded, nonmarine mudstone, siltstone, and sandstone with minor amounts of lignitic to sub-bituminous coal[3] that occurs in thin (less than 5 feet thick), regionally discontinuous beds.[4] The Beluga formation is characterized by a low net-to-gross sand ratio.[5] Beluga sediments were sourced by the erosion of metasedimentary rocks of the Kenai-Chugach Mountains to the east, and deposited by westward-flowing, high-gradient, shallow, braided streams[6] that, over time, built alluvial fans toward the center of the Cook Inlet Basin.[7] Because this fan sequence prograded toward the west, the Beluga depositional sequence grades upward from thin, outwash-plain sandstone deposits in the lower part of the formation to thicker, higher-quality, anastomosing-stream sandstone deposits in the upper formation.[8] Mudstone and coal beds are common to abundant in the Beluga Formation, which is unusual for alluvial fan deposits. The nearby Kenai-Chugach Mountains are composed mainly of metamorphosed fine-grained, deep-sea sediments (metasiltstone, metasandstone, argillite, slate, and phyllite). Erosion of these fine-grained rocks apparently supplied large quantities of silt and mud that was spread over the alluvial fan surfaces by sheet-floods and then stabilized by abundant vegetation.[9,10] As a result, Beluga sandstone reservoirs are commonly laterally discontinuous[11] and isolated from one another by mudstone and siltstone.

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[1] Alaska Oil and Gas Conservation Commission, 2010, Well and Production Information Database

[2] Levinson, R. A., 2011, Beluga River Gas Field, Cook Inlet, Alaska, in 2011 Western Region Meeting, SPE and Pacific Section AAPG, Anchorage, Alaska, Program with Abstracts, p.71 - 72.

[3] UNOCAL, 1986, Geologic and Engineering Report to Accompany Application for Approval for the Initial Participating Area for the Beluga Formation Undifferentiated, Northern Area, Kenai Unit, State of Alaska

[4] Swenson, R., 2003, Introduction to Tertiary Tectonics and Sedimentation in the Cook Inlet Basin; in Dallegge, T.A., ed., 2003, 2001 Guide to the Petroleum, Geology, and Shallow Gas Potential of the Kenai Peninsula, Alaska, AK DGGS Misc. Pub. 128, p. 16.

[5] Levinson, R. A., 2011, cited above

[6] UNOCAL, 1986, cited above

[7] Hayes, J.B., Harms, J.C., & Wilson, T.W., 1976, Contrasts between Braided & Meandering Stream Deposits, Beluga & Sterling Formation (Tertiary), Cook Inlet, AK, in Miller, T.P., ed., Recent & Ancient Sedimentary Environments in AK, AGS Symposium Proceedings, p.J1-J27

[8] Brimberry, D.L., Gardner, P.S., McCullough, M.L., and Trudell, S.E., 2003, Kenai Field, the Kenai Peninsula's Largest Gas Field: in Swenson, R.F., ed. 2002 Geology & Hydrocarbon Systems of the Cook Inlet Basin, AK: Field Trip Guide Book, p. 20-25.

[9] Hayes, J.B., Harms, J.C., and Wilson, T.W., 1976, cited above, p.J6

[10] Winkler, G.R., 1992, Geologic map and summary geochronology of the Anchorage 1 degree x 3 degrees quadrangle, southern Alaska: U.S. Geological Survey, Miscellaneous Investigations Series Map I-2283, scale 1:250000.

[11] UNOCAL, 1986, cited above