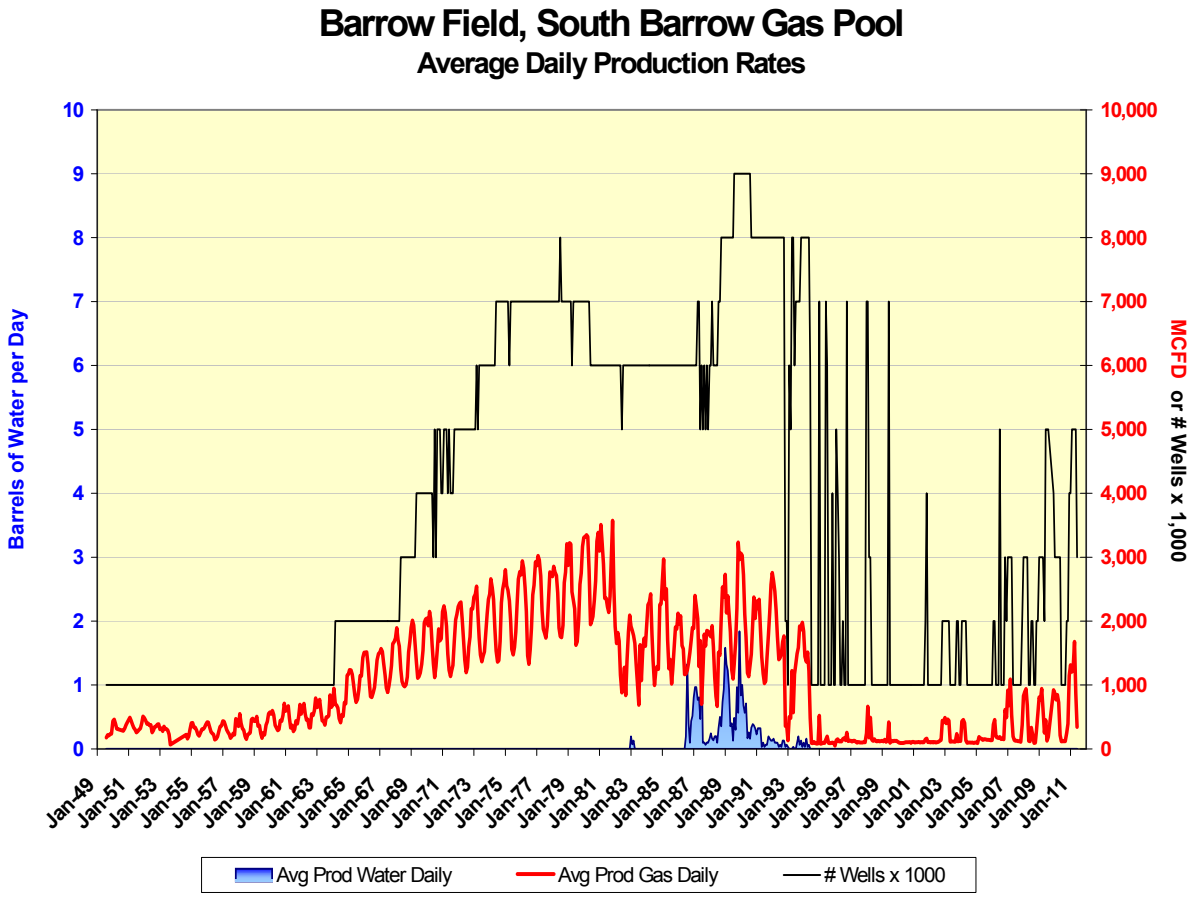
South Barrow Gas Pool

Summary

Near Point Barrow, hydrocarbons have accumulated in Jurassic-aged reservoir sandstone that lies along the western and eastern margins of an apparent impact crater[1] located on the northern flank of the west-to-east trending Barrow High.[2] Drilling and testing of the South Barrow Gas Field began in the winter of 1948 and continued through 1987. During this time, thirteen wells were drilled, and one well, South Barrow 7, was subsequently deepened approximately 64 feet. Regular production from the pool began in August 1949, peaked at 3,571,000 cubic feet of gas per day in November 1981, and began to decline. For the first half of 2011, the pool produced an average of 1,115,000 cubic feet of gas per day.[3]



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[1] Kirschner, C.E., Grantz, A., and Mullen, M.W., 1992, Impact Origin of the Avak Structure, Arctic Alaska, and Genesis of the Barrow Gas Fields; AAPG Bulletin, v. 76, no. 5, p. 651 – 679.
[2] Morahan, G.T., 2008, Characterization and Quantification of the Methane Hydrate Resource Potential Associated with the Barrow Gas Fields; DOE Project Number DE-FC26-06NT42962, Enclosure 6 in PRA's Application for Designation as Gas Wells, Barrow Gas Fields, Dec. 21, 2009, p. 20.
[3] Alaska Oil and Gas Conservation Commission, 2011, Production Database.

Geology

Within the South Barrow Gas Pool, the geologic column contains reservoir quality sands in, from deepest to shallowest, the Barrow Sandstone, which is an informal member of the Kingak formation, the Walakpa (?) Sandstone and thin sandstone layers scattered within the Pebble Shale and the Torok Formation.

Within the South Barrow Field, reservoir quality rock occurs within the Barrow Sandstone, the Walakpa Sandstone, which is thought to be stratigraphically equivalent to the Kuparuk C – Kemik Sandstone of the central North Slope, the Pebble Shale, and the Torok Formation. The highest quality rock occurs in the shallow marine Walakpa (?) Sandstone, where sandstone permeability to air or helium averages 54.3 millidarcies (md; five samples ranging from 8 to 104 md). In South Barrow No. 13, the Barrow Sandstone lies between the measured depths of 2,290' and 2,450'. The marine Barrow Sandstone is of comparable quality, averaging 48 md (41 samples ranging from 0 to 301 md). Within the overlying Pebble Shale, thin (generally less than 2') layers of good-quality sandstone are encased in shale. Though thin, these sandstone layers appear to have good reservoir quality, with permeability averaging 39 md (12 samples ranging from 5 to 80 md). The overlying marine shale deposits of the Torok Formation also contain thin sandstone layers that average 27 md (7 samples ranging from 8 to 60 md).

Direct indications of oil are scattered and generally poor in the South Barrow Gas Field wells. Small amounts of oil or oil staining were reported from six wells: South Barrow 2, 8, 9, 13, NSB-01 and NBS-02.

SFD
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