PRUDHOE BAY, POLARIS OIL

Reference List

Alaska Oil and Gas Conservation Commission, 2003, Conservation Order No. 484, available online at:
http://www.state.ak.us/local/akpages/ADMIN/ogc/orders/co/co400_499/co484.htm

Alaska Oil and Gas Conservation Commission, 2005, Production Database

Prudhoe Bay, Polaris Oil Pool

Summary

The Polaris Oil Pool is located within the western portion of the Prudhoe Bay Unit ("PBU"). It lies within the Late Cretaceous-aged Schrader Bluff Formation ("Schrader Bluff") and the Early Tertiary-aged Ugnu Formation ("Ugnu"). This pool is an accumulation of hydrocarbons common to and correlating with the interval between 5,393' and 6,012' measured depths in the North Kuparuk State 26-12-12 well.[1] The pool has been producing continuously since November 1999 from the PBU W-Pad and S-Pads. Between November 1999 and December 2001, oil production averaged 1,110 barrels per day, with W-Pad contributing 700 barrels per day (62%). Since January 2002, W-Pad has continued to dominate production. In December 2004, oil production from Polaris Pool averaged 2,830 barrels. Of that, W-Pad produced 92%.[2]

Geology

The pool encompasses reservoirs assigned to the Late Cretaceous-aged Schrader Bluff Formation and the Early Tertiary-aged Ugnu Formation. The Schrader Bluff was deposited in a marine shoreface and shallow shelf environment, and it is divided into two stratigraphic intervals that are designated, from deepest to shallowest, the "O-Sands" and the "N-Sands."[3] The O-Sands vary in thickness from 215' to 320', and the N-Sands vary from 95' to 165' thick.[4] The overlying Ugnu reservoir intervals, informally termed the "M-Sands," were deposited in deltaic and fluvial environments.[5] The M-Sands vary in thickness from 180' to 250'.[6] The pool lies between approximately 4,800' and 5,300' feet true vertical depth subsea.[7] The Polaris structure dips gently to the east and northeast, and it is broken into a series of reservoir compartments by three sets of normal faults: one trending NW, the second trending N, and the third trending W. The NW- and N-trending faults range in vertical displacement up to 200 feet; they are the primary controls for oil distribution in the PBU W-Pad, S-Pad and M-Pad areas. The W-trending faults range up to 100' in vertical displacement, and they trap oil in the center and along the southern margin of the pool, near the Term Well C, and near PBU N-Pad. Oil distribution is complex: within the O- and N-Sands, ten oil-bearing intervals are recognized, and oil-water contacts appear to vary in depth. In the M-Sands, oil-water contacts are concentrated in the crestal portions of the structure, but they appear to vary in depth within different M-Sands suggesting that each behaves as a separate reservoir unit. The primary reservoirs of the pool lie in the O-Sands, and secondary accumulations occur in the N-Sands. API oil gravities range from 17 to 26 degrees. The M-Sands contain significant reserves, but the oil is biodegraded and viscous[8], with API gravity ranging from 12 to

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[1] Alaska Oil and Gas Conservation Commission, 2003, Conservation Order No. 484, available online at: http://www.state.ak.us/local/akpages/ADMIN/ogc/orders/co/co400_499/co484.htm
[2] Alaska Oil and Gas Conservation Commission, 2005, Production Database
[3] Alaska Oil and Gas Conservation Commission, 2003, Conservation Order No. 484, available online at: http://www.state.ak.us/local/akpages/ADMIN/ogc/orders/co/co400_499/co484.htm
[4] BP, 2002, Polaris Pool Rules and Area Injection Order Application, in Alaska Oil and Gas Conservation Commission Conservation Order No. 484, p. 5 – 15.
[5] Alaska Oil and Gas Conservation Commission, 2003, Conservation Order No. 484, available online at: http://www.state.ak.us/local/akpages/ADMIN/ogc/orders/co/co400_499/co484.htm
[6] BP, 2002, Polaris Pool Rules and Area Injection Order Application, in Alaska Oil and Gas Conservation Commission Conservation Order No. 484, p. 5 – 15.
[7] Alaska Oil and Gas Conservation Commission, 2003, Conservation Order No. 484, available online at: http://www.state.ak.us/local/akpages/ADMIN/ogc/orders/co/co400_499/co484.htm
[8] Alaska Oil and Gas Conservation Commission, 2003, Conservation Order No. 484, available online at: http://www.state.ak.us/local/akpages/ADMIN/ogc/orders/co/co400_499/co484.htm

14 degrees.[9] Original oil in place ("OOIP") is estimated between 350 and 750 MMSTBO. Of this, 300 to 550 million MMSTBO are estimated within the O-Sands. There are no indications of a free gas column in the pool. The oil is undersaturated, containing between 84 and 250 billion standard cubic feet ("scf") of gas in solution, with 75 to 195 billion scf attributable to the O-Sands. At 5,500' true vertical depth subsea, the reservoir temperature is about 98 degrees F. [10]

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[9] BP, 2002, Polaris Pool Rules and Area Injection Order Application, in Alaska Oil and Gas Conservation Commission Conservation Order No. 484, Exhibit I-5.
[10] Alaska Oil and Gas Conservation Commission, 2003, Conservation Order No. 484, available online at: http://www.state.ak.us/local/akpages/ADMIN/ogc/orders/co/co400_499/co484.htm