

The Granite Point Field, Cook Inlet, Alaska

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The Granite Point Field was discovered by the Pan American Tyonek State 18742-1 well in July of 1965. The well tested oil from the Tyonek formation between 8,000 to 9,000 ft. TVD. Pan American drilled and completed an additional four wells over the next 14 months to appraise and define the limits of the field. Within a month of the initial discovery Mobil oil completed their Granite Point 1 well to extend the Tyonek accumulation to the south. In addition, the well tested oil from the Hemlock formation. Shallow gas has been detected in the Beluga Formation and produced from the Tyonek for use in providing fuel to the field facilities.

The Granite Point Field is located on the west flank of the Cook Inlet Basin, a forearc basin associated with the subduction of the Pacific plate beneath the accreted terranes of Alaska. The field is characterized by a NNE-SSW elongated sharp asymmetric fold bounded on the west by a reverse fault that is interpreted to extend into the basement. A number of seismically defined normal faults cross cut the field. The main phase of structural development occurred in the Middle to Late Miocene as the Cook Inlet Basin underwent a period of increased transpression.

Source rock analysis and oil geochemistry studies have identified the Jurassic Tuxedni marine shales as the source for the oil. Basin modeling and source rock maturity studies indicate that the oil was generated to the east in the deeper portion of the basin and migrated up faults and along laterally continuous sands in the lower Tertiary. The gas accumulation in the shallow interval is considered biogenic, sourced from the numerous interbedded, laterally continuous sub-bituminous coals found throughout the Tyonek and Beluga. Original oil in place is estimated to be 730 MBO.

The oldest rocks penetrated in the field are the moderately metamorphosed marine clastics of the Lower Jurassic. A significant erosional unconformity developed at the end of the Mesozoic followed by deposition of a thin Eocene West Foreland, Oligocene Hemlock and the Oligo-Miocene Tyonek formations. The Beluga Formation overlies the Tyonek with Holocene glacial deposits extending up to the seafloor. The entire Tertiary section is characterized by fluvial deposits of conglomerate, sand and silt separated by overbank claystones and coal. The deep gravel-bed braided to sandy meandering depositional environments have created reservoirs of poor to fair quality and fair to moderate lateral continuity.

Field development began with the setting of three oil production platforms by early 1967. Production peaked at close to 50,000 BOPD then began a rapid decline until a continuous water injection program was instituted first on the Granite Point Platform in 1970 followed by the Anna and Bruce platforms in 1972. The field has gone through phases of re-drilling and suspensions of water injection maintaining a modest

decline into the late 1990's. Since that time the field has been on roughly a 10% decline having produced over 145 MMBO with a current rate of over 2,000 BOPD.