



# Alaska Heavy Oil

**Erik Hulm**  
**BP Exploration Alaska Inc.**  
Anchorage, Alaska

*Note: AGS meetings will be at the BP Energy Center for 2010-2011.  
Please check the website ([www.alaskageology.org](http://www.alaskageology.org)) and issues of the AGS newsletter for updates.  
This Newsletter promotes the April luncheon of the Alaska Geological Society  
to be held Thursday, April 21<sup>st</sup>, at the BP Energy Center.*

Alaska's North Slope is a world-class petroleum basin with some of the largest producing fields in North America. Over 70 billion barrels of oil have been discovered across the central North Slope. Forty billion barrels of this resource are classified as conventional, light oil and to date over 16 billion barrels have been produced. The remaining 30 billion barrels are classified as unconventional or heavy oil. Though heavy oil accounts for over 40% of the original oil in place, only 150 million barrels have been produced. High viscosities and a lower price on the market have been barriers to large scale heavy oil development, but with declining light oil production and limited discovery of new oil reserves, heavy oil has the potential to play a major role in the future of Alaska North Slope production.

Alaska heavy oil is located in shallow sands that overlie the producing light oil fields. The primary reservoirs are the Schrader Bluff, West Sak, and Ugnu sands. Current heavy oil production is restricted to the lower viscosity oils in the Schrader Bluff and West Sak reservoirs where oil is being produced through the application of waterflood. The Ugnu sands account for over half of the heavy oil in place but have received little attention due to higher oil viscosities. To test the production potential of the Ugnu, BP has initiated an appraisal campaign focused on the Milne Point Unit in which a \$100mm pilot is featured.

## AGS Luncheon

**Date & Time:** April 21<sup>st</sup>, 11:30 am – 1:00 pm

**Program:** Alaska Heavy Oil

**Speaker:** Erik Hulm, BP Exp. Alaska Inc.

**Place:** BP Energy Center

**Reservations:** Please make your reservation before noon Tuesday, April 19<sup>th</sup>, 2011.

**Cost:** Seminar only, no meal: Free

Reserve a box lunch: \$15

Reserve a hot lunch: \$20

**Lunch with no reservation:**  
On an "as-available" basis only

**E-mail reservations:** [vp@alaskageology.org](mailto:vp@alaskageology.org)  
Or phone (907) 269-8673  
(Ken Helmold, AGS VP)

**For more information: visit the AGS website:**  
[www.alaskageology.org](http://www.alaskageology.org)

The Ugnu heavy oil accumulation occurs along a regional, normal faulted, monocline that dips at 1° to 2° to the northeast. The accumulation occurs within a series of structural compartments that are bound by multiple fault families of distinct ages and orientations. Fluid quality within the Ugnu resource is linked to the regional structural dip and temperature gradient with decreasing oil viscosity toward the deeper eastern reaches of the accumulation. The Ugnu sands were deposited during the Late Cretaceous and Early Tertiary within a regionally extensive, fluvial-deltaic complex. The M-sand interval contains the primary reservoirs in the Ugnu. The reservoirs are regionally extensive single and multi-storey lower delta plain channels and sandsheet complexes, consisting of high quality, unconsolidated, clean sands separated by thinner, silty mudstone units. Sand bodies tend to be high net-to-gross, but exhibit significant lateral variability in thickness and facies type. Some of the interbedded mudstones are laterally continuous and vertically segregate individual hydrocarbon bearing reservoir units.

Ugnu rock and fluid properties are similar other heavy oil resources currently under development around the world. To better understand the link between resource characteristics and recovery techniques, an extensive review of analog fields was conducted. Application of analog learnings to the Ugnu resource indicates that a variety of recovery processes might be used to develop the Ugnu. Primary recovery methods show potential in the deeper, less viscous oils in the eastern half of the resource whereas heavier oils in the west will require a different approach to reduce viscosity and mobilize the oil such as steam or solvent injection processes. Benchmarking has also highlighted a number of Ugnu attributes that are unique including reservoir depth, degree of faulting, and thick permafrost in the overlying stratigraphy. The potential impact of each of these attributes and the viability of recovery methods can only be understood through pilot testing. BP's first heavy oil pilot is located in the eastern, lower viscosity portion of the resource and will test the viability of primary recovery processes.

### **About the Author:**

Erik Hulm is the Heavy Oil Appraisal Team Leader for BP Alaska. He has a Bachelor's degree in Earth Science from the University of South Dakota and a Masters degree in geology from the University of Alaska Fairbanks. He has twelve years experience in oil and gas exploration, appraisal, and development in both domestic and international locations. Erik has spent the last five years working on heavy oil in Alaska, focusing on resource characterization, development screening, technology progression, and production pilot testing.

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