



Tech Talk - NPRA and ANWR: Will They Help TAPS?

Posted by [Heading Out](#) on September 4, 2011 - 12:29pm

Topic: [Supply/Production](#)

Tags: [alaska](#), [anwr](#), [decline rate](#), [national petroleum reserve-alaska](#), [npra](#), [oil reserves](#), [usgs](#) [[list all tags](#)]

When I wrote about the Alaskan Pipeline [last week](#), I noted that the pipeline was currently flowing at a volume of 495 kbd after the Alyeska folk who run the system had just issued a report indicating that there would be problems once the flow fell below 600 kbd. Checking the flow rate for August ([posted on Sept 1](#)), the flow rate has risen back to 539 kbd, with average flow for the year-to-date running at 568 kbd. (The [EIA reported final average](#) for 2010 was 589 kbd)

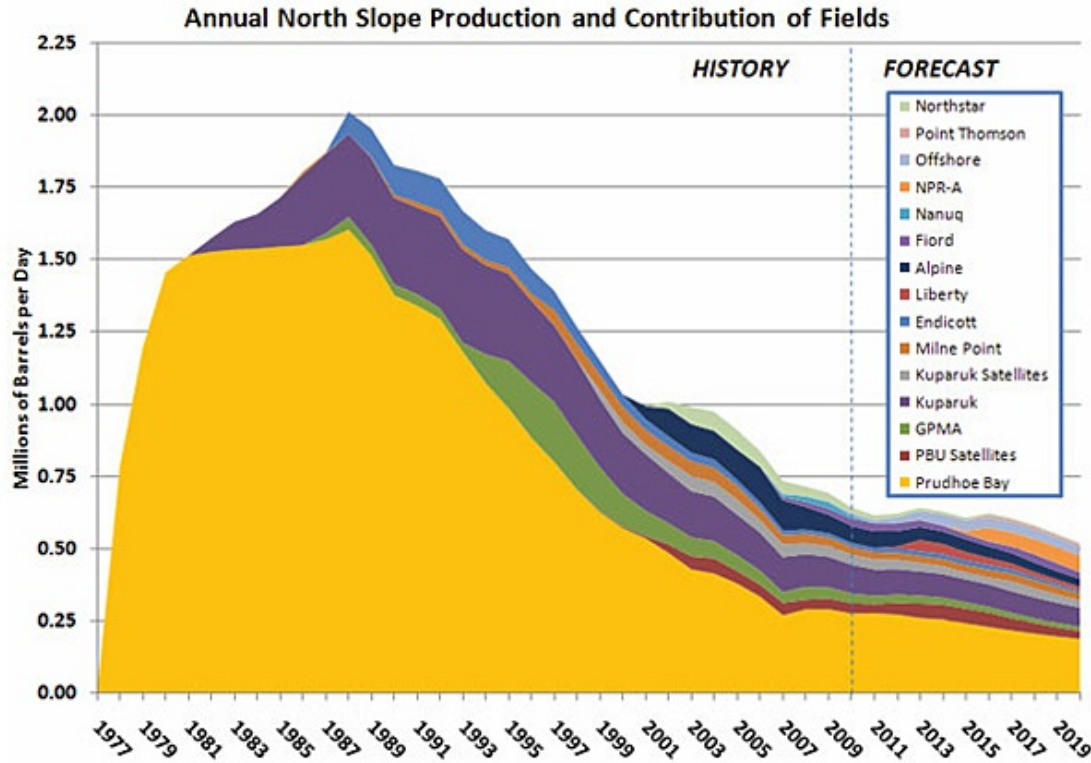
The problems that come with low flow (including reduced revenues) are recognized within the state and Alaskan Governor Parnell [has urged](#) that enough new wells be brought on line to allow flow to be raised back up to 1 million barrels a day (mbd) within ten years. With the ongoing decline of current reservoirs, one has, therefore, to look at the reservoirs that lie north of the Brooks Range, in what is known as the North Slope (though it is rather flat) and see what can be brought on line.

It should be remembered as a part of this, that despite talk of global warming, Northern Alaska is not a place where you can just drive a rig to a promising site and drop a new well in place within a couple of weeks. Nor has it the same level of Government scrutiny. For while the [President has encouraged](#) renewed drilling in the region, Shell, who was planning on a new program this year, has had to postpone it until next year because of an EPA concern [over air quality permits](#). The nearest community to the planned wells in the Chukchi Sea is some 70 miles away, and has 245 inhabitants.



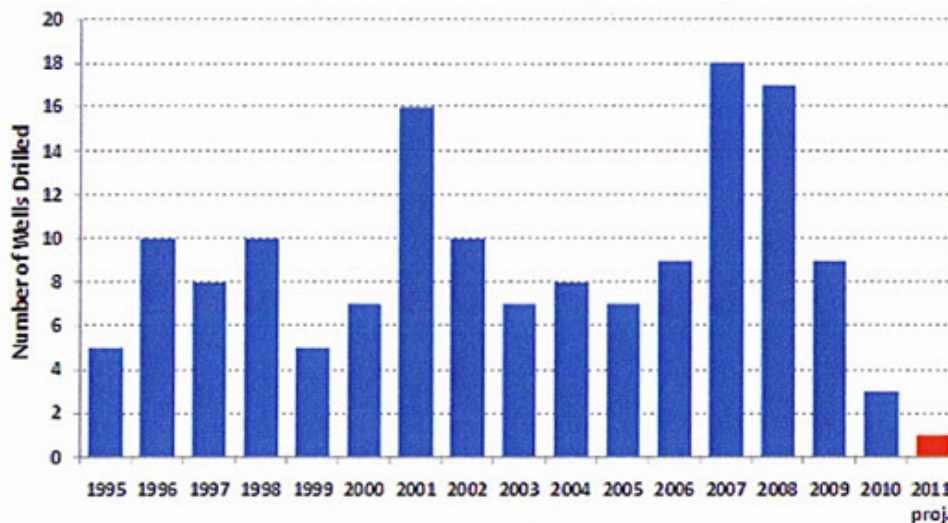
Relative location of the proposed new drilling activity off Alaska

The need to find and develop a replacement for the Prudhoe Bay field and its adjacent fields is clear from the way in which the fields have been depleting.



Contribution of the different fields to Alaskan Production ([Governor's Office](#))

The impracticality of an immediate turn-around in the current decline is perhaps indicated by the fact that [only one exploratory well](#) will have been drilled in the state in 2011.



Source: Alaska Oil and Gas Conservation Commission and Department of Natural Resources

Exploratory wells drilled in the North Slope ([Governor's Office](#))

There must therefore be some incentives if companies are to drill in the future and the Governor believes that this will come about with a [change in the tax incentives](#) from the State. This need for some incentives is particularly true given the cost of operations that far North. Shell, for example, has spent close to [\\$4 billion so far](#) and has yet to start development. It is also expensively seeking to [ameliorate some of the concerns](#) raised after the Deepwater Horizon disaster.

Shell is proposing to use two drill ships, each capable of drilling a relief well for the other in case of the kind of blowout that destroyed the Deepwater Horizon rig. The company is also promising to add more testing and an extra set of shears to its blowout preventers and to keep emergency capping systems near drilling sites to capture any potential leaks.

But disregarding the politics, there is the question of how much oil is there?

The USGS has often given estimates of the technically recoverable resources that can be found in a region, but in the case of the North Slope they have taken this analysis one step further. A [recent report](#) took a review of the resources likely to be found in the National Petroleum Reserve- Alaska (NPRA) and applied some costs for the likely development of those resources, from which they came up with an estimate of the likely economically recoverable amount of oil that the NPRA holds. The analysis, both of what is there and its likely extraction cost, included some 30 exploration wells not previously considered. The analysis is also statistical in that, without actually drilling the rock, they can only estimate the likelihood of how much oil and gas are there. However, one thing that the exploration wells showed is that a lot of what was thought to be oil in the reserve is actually gas. Further, that the reservoir quality is worse than originally estimated. When the two are combined, the estimate of the likely oil to be found and recoverable fell from 10.6 billion barrels of oil (bbo) to 895 million barrels of oil (mbo), of which some 500 mbo are likely to be economically recoverable. (This is the mean estimate).

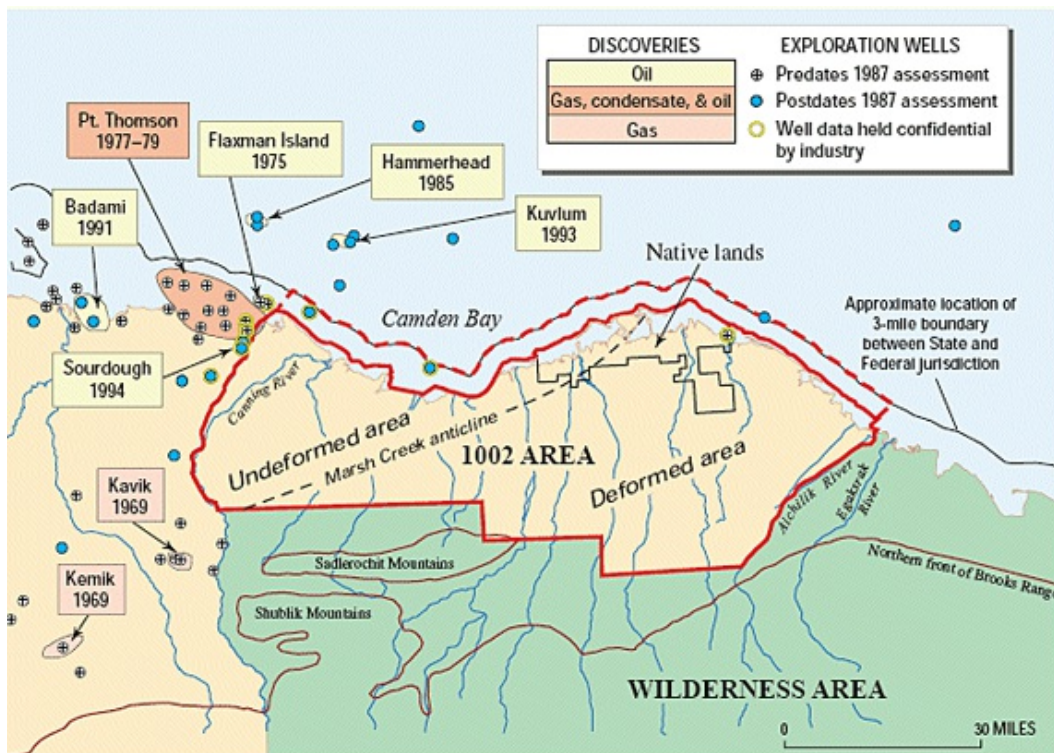
The USGS also considered the gas volumes present, and with no present way of getting the large quantities of natural gas that exist up there down to a consumer (and with costs likely at the moment to exceed those at which natural gas is available from other sources), they assumed that it will take at least 10 years for the gas to find a path to market. If it takes twice as long, then the amount of recoverable oil is likely to be only about 358 mbo. For a 10-year delay, the mean estimate for the amount of recoverable natural gas is 17.5 Tcf (trillion cubic feet) but this drops to 7.3 Tcf if it takes 20-years to get a pipeline in place. (Note that the amount of natural gas held in the NPRA is, at the mean, considered to be 52.8 Tcf). I am not going to go into the details of either the [geological estimate](#), or the [economic analysis](#) but these are provided in the USGS reports. It is interesting, however, that they used a 12% decline rate (which they defend). The news about the condition of the reserves has apparently led some companies to [relinquish their assets](#) in the NPRA.

On the other side of Prudhoe Bay lies the Alaskan Wildlife Refuge, and particularly that part running along the coast that has been designated as ANWR – 1002, or more comprehensively, the ANWR Coastal Plain. Just north of the coast lies Camden Bay in the Beaufort Sea, and it is here that Shell has just had permits approved for [four exploratory wells](#) that should be drilled next year.



Location of the ANWR Coastal Plain, relative to Prudhoe Bay ([ANWR](#))

For the Coastal Plain itself, the USGS last updated their [assessment in 1999](#), and using the mean values considered (the others are given in the report), the technically recoverable oil in place would be 7.7 bbo out of a total 20.7 bbo in Area 1002. If one assumes that the same sort of economic criteria apply to ANWR as applies to the NPRA, then one might assume that roughly 55% of that technically recoverable might be also economically recoverable, for a total potentially available from ANWR therefore as being around 4.3 bbo. However, it may also be that the same changes in both the reservoir rock and the type of hydrocarbon present may occur in ANWR as in NPRA, and if that comes to be the case, then the economically recoverable oil may fall to 10% of the current estimate, or around 430 million barrels. Not to be sneezed at, but not nearly as promising a number as has been discussed in the past.



More detailed view of the 1002 Area (USGS via [planetforlife](#))

While these numbers are still somewhat speculative, until a bit actually drills down to the rock and validates what is really there, the likely more critical conclusion at this time is that it is unlikely there will be enough new oil coming into the pipeline in the next few years to stave off continued decline and potential pipeline closure.

I had planned on writing about drilling in the Arctic and development and the off-shore fields, however I will put that off until next time.



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