

ANWR Resource Estimates

The debate over oil and gas development in the Arctic National Wildlife Refuge (ANWR) is about as hot as it's ever been, thanks to soaring fuel prices, domestic energy shortfalls and a political about-face in the nation's Oval Office. At the core of many arguments — pro and con — are results of the 1998 U.S. Geological Survey (USGS) study on ANWR's petroleum potential.

Pro-Development Resource Estimates: *Defensible and Desirable*

The USGS report is thorough, presenting estimates that use a number of alternative resource concepts. Industry is often accused of distorting ANWR's potential by focusing on the highest of these estimates. Not true. Numbers cited by advocates of ANWR drilling accurately characterize the USGS study conclusion — that ANWR contains undiscovered resource volumes of 5.7 to 16 billion barrels of crude oil, with an expected value of 10.4 billion barrels. Moreover, the USGS standard practice does not include any prospective effects of future technological change. One could argue, therefore, that USGS numbers are more likely to be conservative estimates of the true recovery potential of ANWR. On the flip side, several other numbers are cited by various opponents of development. Many are simply incorrect. An example is the 3.2 billion barrel estimate often attributed to the 1998 USGS study. This may have originated with the 1987 BLM EIS, or it may be based on a misinterpretation of data presented in the 1998 USGS report. In either case it is wrong.

1998 USGS study concludes that ANWR contains recoverable resource volumes of 5.7 to 16 billion barrels of crude oil, with a mean of 10.4 billion barrels. This is the range cited by industry.

Estimates are for the entire 1002 area, which includes private and federal property. This geographical coverage is relevant, since none of the private lands within ANWR can be developed without opening federal lands.

Estimated recovery from Prudhoe Bay was initially estimated at about 35%, but new technology applied since that time has progressed steadily, and recovery is now expected to exceed 65%.



Estimated Recoverable Resources: *Understated and Justified*

The table below presents the key resource estimates presented by USGS in its 1998 assessment. These estimates are for the entire 1002 area (Coastal Plain), which includes both private lands and federal property. This geographical coverage is relevant, since none of the private lands within ANWR can be developed without opening federal lands. Within this area, USGS estimates that there are between 15.6 and 42.3 billion barrels of oil in place, with a mean of 27.8 billion barrels. From this, USGS derives the 5.7-to-16.0 billion barrel range as being recoverable using the technology of the mid-1990s. Anti-development groups often

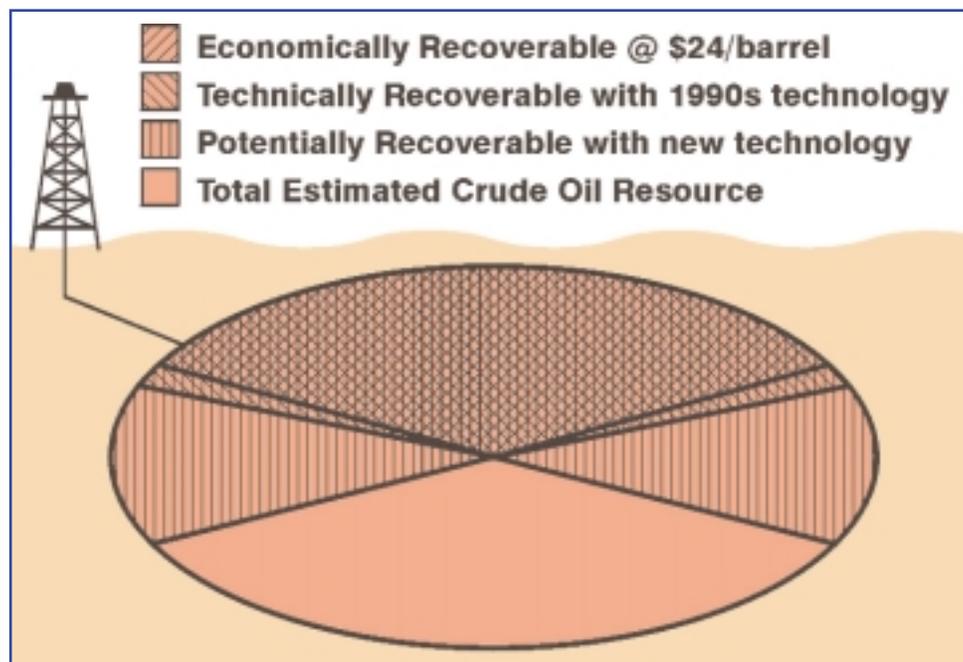
ANWR 1002 Area Crude Oil Resource Estimates			
(in billion barrels)			
Estimate Range Probability	95%	Mean	5%
In-Place Resources	15.577	27.778	42.319
Technically Recoverable	5.724	10.36	15.955
Technically Recoverable as % of In-Place	37%	37%	38%
Economically Recoverable			
as a % of Technically Recoverable			
@ \$12/barrel West Coast	0%	5%	11%
@ \$18/barrel West Coast	48%	61%	71%
@ \$24/barrell West Coast	87%	88%	91%

criticize use of *technically* recoverable resource numbers, rather than the narrower concept of *economically* recoverable resources. But a closer look confirms that use of the technically recoverable numbers does not overstate the resource base. As seen in this Table, at extremely low price levels (\$12 on the West Coast), the commercially developable resources are only a small portion of the technically recoverable resource (0-11%).

However, at a more realistic price of \$24, the commercially developable portion of the resource approaches 90%, and at \$30, virtually all of the technically recoverable resource is commercially viable.

The Technology Factor: *Considerable and Real*

Technically recoverable volumes cited in the USGS assessment are very conservative. Remember that USGS estimates assume only current technology. In this case, the agency assumes only about 37% of the oil in



place can eventually be recovered. Estimated recovery from Prudhoe Bay was initially estimated to be about 35%, but the application of new technology since that time has progressed steadily, and recovery is now expected to exceed 65%. Similar experience with ANWR could raise eventual recovery well beyond the USGS estimate. For example, 65% recovery would imply a range of 10 to 27 billion barrels, with a mean of 18 billion barrels.