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Linc Energy refines Umiat oil field estimates

Published: September 3, 2012

Company aims to have prospect in production in five to seven years.

By ERIC LIDJI — Petroleum News

Linc Energy Inc. has released third-party estimates of the reserve potential of its Umiat prospect that show both a big increase and a small decline from previous figures.

The consulting firm Ryder Scott Co. estimates that the undeveloped oil field in the Brooks Range foothills contains reserves of 154.5 million barrels of proved and probable oil equivalent (referred to as P2) and 194 million barrels of proved, probable and possible oil equivalent (P3).

When Linc, an Australian independent, acquired Umiat last summer, it estimated the field held some 108 million barrels of P2 reserves and 201 million barrels of P3 reserves.

For purposes of the reports, "probable" means at least a 50 percent chance of actual recovered volumes meeting or exceeding the P2 estimate, and "possible" means at least a 10 percent chance of actual recovered volumes meeting or exceeding the P3 estimate.

The Umiat field is generally believed to contain about 1 billion barrels of oil.

This winter, Linc plans to drill as many as three vertical wells -- two shallow and one deep -- a horizontal well into the Lower Grandstand formation and a disposal well at Umiat. The company intends to bring the field into production within five to seven years.

Even though it's been decades since any drilling occurred in the region, Umiat reserve estimates have risen dramatically in recent years as technological advances have given companies increasing confidence in the amount of oil they can recover from the reservoir.

Umiat is the largest oil field the U.S. Navy discovered during its far-reaching exploration campaign across what is now known as the National Petroleum Reserve-Alaska. Because all 12 wells drilled at Umiat to date have been government efforts, the field carries a unique public record of reserve estimates over the 60 years since its discovery.

Between 1945 and 1952, the Navy drilled 11 wells at Umiat, discovering and delineating the prospect. From the start, researchers understood Umiat to have a unique reservoir.

"Behavior of the wells during testing was unpredictable," U.S. Bureau of Mines petroleum engineer Oren C. Baptist wrote in a 1960 study of the formation. "For example, one well was abandoned as a dry hole after all tests failed to recover any oil, yet an offset well, only 200 feet from the dry hole, produced 400 barrels of oil a day."

Geology presumably caused some of this unpredictable performance. The Umiat reservoir is shallow, partially frozen in permafrost and low pressure, making production tricky.

But engineering played a role, too.

Baptist hypothesized that warm drilling mud had thawed the permafrost, allowing water to seep into the

formation, freeze the sand and eventually plug the well.

These challenges made it difficult to determine recoverable reserves.

At a meeting in June 1951, before the end of the initial drilling campaign, six groups presented different and wide ranging estimates of the recoverable reserves at Umiat.

Just within government agencies, the Navy estimated between 2 million and 17 million barrels while the U.S. Bureau of Mines estimated 151 million barrels. Upon request of the Navy, Union Oil Co. of California studied the available information and estimated 30 million barrels with an additional 10 million barrels possible from additional exploration.

The firm DeGolyer and MacNaughton estimated 57 million barrels and the firm Arctic Contractors offered an estimate between 64 million and 107 million barrels. The geologist Andrew Milek placed his recoverable reserves estimate at 85 million barrels.

In a June 1953 Navy-commissioned report, Arctic Contractors used those figures to put forth 70 million barrels as a "reasonable average estimate" of the recoverable oil reserves.

Within two years, though, the more bullish groups all revised their estimates down.

After incorporating reservoir information from an analysis of one of the later wells in the program, DeGolyer and MacNaughton dropped its estimate to between 18.8 million and 37.6 million barrels, but allowed for a slight bump if a shallower sand proved productive.

Using the same geologic assumptions, but a more optimistic recovery rate, Arctic Contractors dropped its estimate to between 51.6 million and 103.2 million barrels.

After also adjusting its calculations to incorporate information from later delineation wells, the Bureau of Mines cut its estimate down to 122 million. And after calculations suggested the reservoir might cover a smaller area than original thought, the Bureau of Mines considered revising its estimate further to 93 million.

Those figures all had something in common: they didn't justify development.

In addition to concerns about reservoir pressure and permafrost affecting recovery, even the most optimistic assessments could not overcome the remoteness of the prospect.

The field is considered far-flung today, and in the years before the discovery of Prudhoe Bay and the subsequent construction of the trans-Alaska oil pipeline, any oil field in northern Alaska needed to be large enough to support a pipeline to southern Alaska.

And so the 70-million-barrel "reasonable average estimate" stayed around for decades, even after the Navy drilled the Seabee No. 1, deeper test well in the region, in 1979.

The Alaska Division of Oil and Gas used a similar figure in a 1997 evaluation of the petroleum potential of the eastern National Petroleum Reserve-Alaska, citing a 1993 U.S. Department of Energy analysis as its source. The U.S. Geological Survey estimated Umiat contained between 30 million to 100 million recoverable barrels, a range roughly bookending the earlier estimates.

With high oil prices, declining North Slope production and improved technology in the 2000s, though, interest in Umiat increased and reserve estimates increased as well.

The Colorado-based independent Arctic Falcon Exploration picked up the Umiat leases from a sister company in early 2001, but did not explore on its own. Through a series of deals, the Texas independents Renaissance Alaska LLC and Rutter and Wilbanks Corp. acquired Umiat leases and the three companies formed Renaissance Umiat LLC in 2007.

About the same time, Anadarko Petroleum Corp. was conducting a geologic assessment of the Brooks

Range foothills, a region where it was leasing more than 3 million acres.

Its assessment included the Umiat area.

"Reserves are questionable in that area, but we think there's up to about 100 million barrels recoverable from Umiat," Greg Hebertson, in corporate and strategic planning for Anadarko at the time, told Petroleum News in May 2002. Specifically, he noted how Umiat and other areas across the foothills had a "propensity for multiple structural traps."

Renaissance staked 10 well locations before the winter of 2007 and 2008, but put drilling plans on hold because of weather issues and commissioned a seismic survey instead.

After the survey, an assessment of field reserves by Ryder Scott Renaissance estimated that Umiat contained 250 million barrels of economically recoverable (P3) oil. The big jump came from incorporating technological advances such as horizontal drilling, and modern secondary and enhanced oil recovery techniques, according to Jim Watt, then president and CEO of Renaissance.

After weather issues forced Linc to delay its drilling program last winter, the company spent an additional year processing and interpreting its seismic. Its newest assessment, also by Ryder Scott, estimates lower recoverable reserves in the best-case scenario than Renaissance, but higher recoverable reserves in the P2 or more likely scenario.

And with its program this winter, Linc is in a rare position: assessing Umiat by drilling.

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