The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

Tech Talk - Oil Production from Western Siberia

Posted by Heading Out on January 29, 2012 - 4:54am
Topic: Supply/Production
Tags: fedorovskoye, mamontovskoye, romashkino field, salym, samotlor, western siberia [list all tags]

Time marches on, and as I noted in an earlier post, the declining fortunes of the Romashkino and other oilfields in the Volga-Urals Basin led into the development of the fields of Western Siberia, where even some forty years after it was discovered, just over 60% of Russian crude is still being produced today.

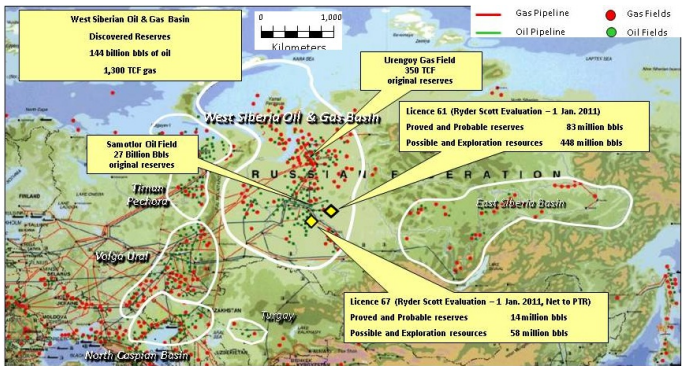
	2009 Production Volumes (Thousand bbl/d)
Production by Region	
Western Siberia	6570
Urals-Volga	2030
Northern Caucasus	800
Arkhangelsk	370
Sakhalin	310
Komi Republic	270
Krasnoyarsk	70
Yakutiya	60
Irkutsk	30
Kaliningrad	30

Russian production in 2009, broken down by region (the total is 10.48 mbd) (EIA)

Back in 2007, production was at 70% of total Russian crude oil production with a daily production of 7 mbd., so changes in the mix already were occurring. At its peak in 1980, Samotlor, the largest field in the region, was producing at 3.4 mbd, out of a Soviet production of 12.5 mbd. Samotlor is thus ranked 7th in the world in terms of original oil reserves, and as a comment on the times, it still ranks 6th in the world in terms of daily production even while production has fallen to 750 kbd. Initial reserves stood at 27 billion barrels of oil, though this was not initially evident when the field was discovered in 1965. Water cut has increasingly taken its toll of the field, and now runs at around 90%.

Gas Flare over Samotlor in the marshes of West Siberia (Geotimes)

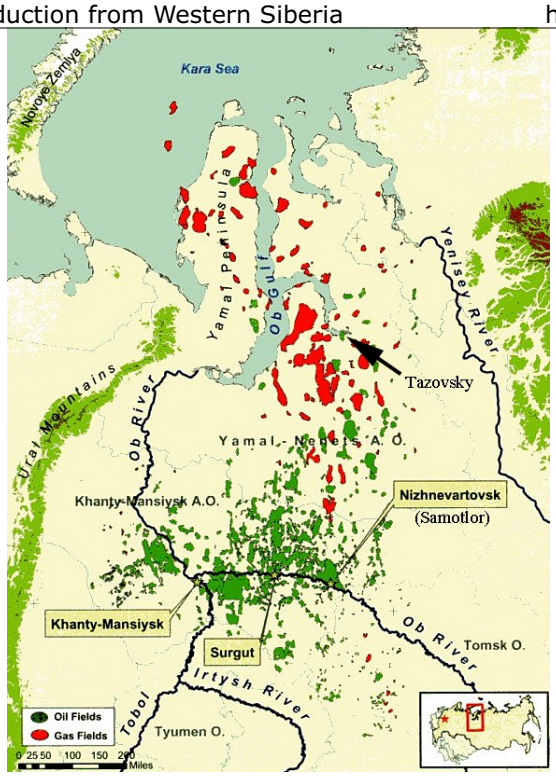
It took some persuasion to get the Soviet oil industry to move that far East. The new fields were some 600 miles further East than those of the Western Urals, and the country was divided between taiga and swamp. There weren't a whole lot of people, either.



The different regions of Russian oil production (Petroneft)

Much of that has changed, with the center of the oil industry now located in and around Khanty-Mansiysk, built mainly after 1931 when it became the capital of the Ostyako-Vogulsky National Okrug. A settlement since 1637, it was given its current name in 1940, and became a city in 1950. As a sign of the changing times, the provincial budget from oil revenues was $4.5 billion in 2008.

Oil seeps have been reported in the outcropping of rocks along the Ob River since the seventeeth century, and I.M. Gubkin, the founder of petroleum geology in the Soviet Union, predicted the presence of oil as early as 1932. Serious exploration began in 1954. In 1962, a well drilled near Tazovsky produced natural gas at a flow rate of a million cu m (35 mcf) a day and the Tazovskoye oil and gas field had been found. Originally it was developed as an oil field, but more recently its natural gas potential has been more fully recognized, as has that of the entire Yamal Peninsula. (And at the same time, that 70% of Soviet oil was coming from Western Siberia, so was 90% of their natural gas.)

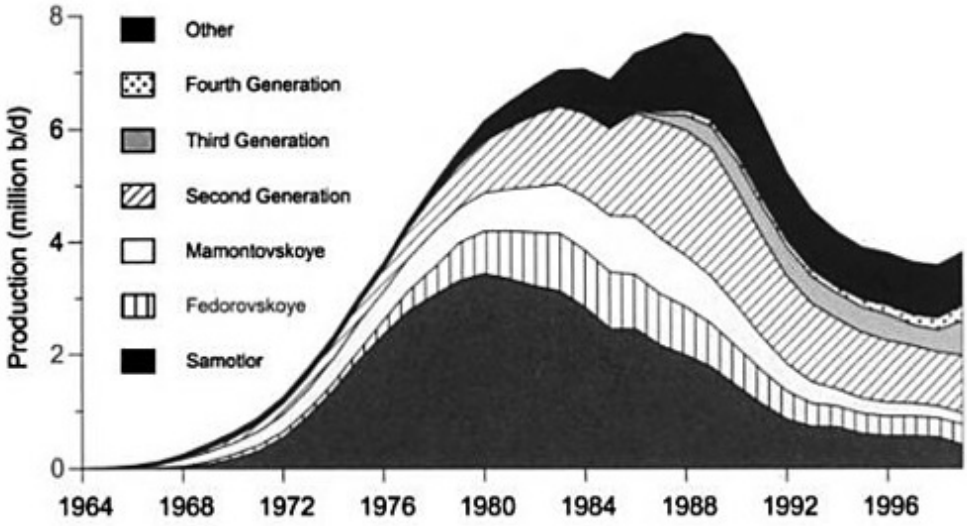


The oil and gas fields of Western Siberia (after Grace – Russian Oil Supply)

Tazovsky by Vghik (Google Earth)

The northern part of the West Siberian Basin (which, as Grace points out, covers an area about four times the size of France) has been where the most recent exploration has taken place. But it was further south and east along the Ob River that the first three major fields, Fedorovskoye and Mamontovskoye near Surgut, and Samotlor, which lay further East near Nizhnevartosk, were found between 1963 and 1965. An oil pipeline was laid in 1967, allowing year-round production. From the beginning, construction and development was a problem given the local geography, and ways had to be found of getting production equipment into the marshy ground and getting the oil and gas out. For many years, the Ob river was the main highway.

These three fields underpinned Soviet oil production through the 1980s, and with the 14 fields that were added in the second generation, the 7 that came on line for the third generation, and the 8 that made up the fourth generation, kept the Soviet Union well supplied until its collapse at the end of 1991.



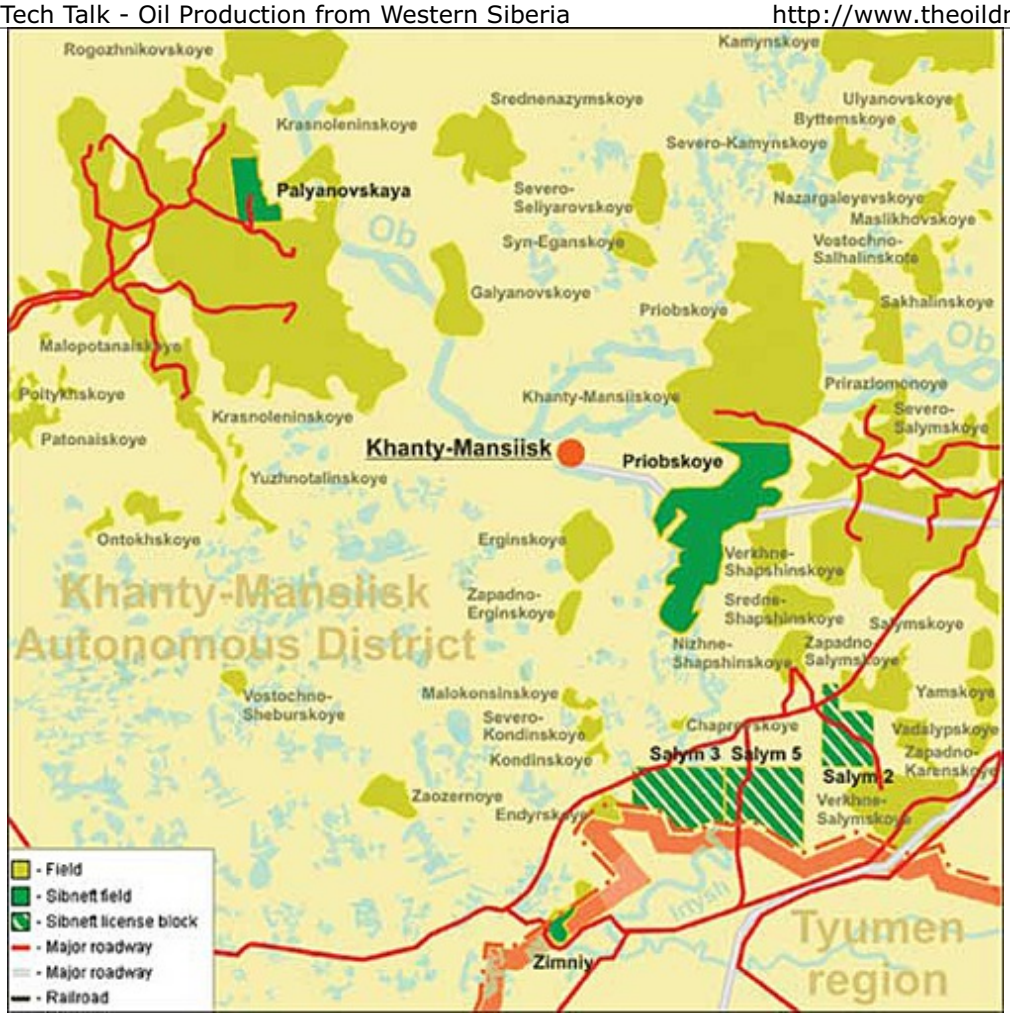
Crude Oil Production from Western Siberia (Grace – Russian Oil Supply)

Over the past decade, these fields have been rehabilitated and raised production by more than 60% over that at the depths of the crash, after the dissolution of the Union.

Fedorovskoye is run by Surgetneftegas, a company that drilled 1,403 wells in 2011, including 708,000 ft of exploration. In 1993 the company was allowed to become an open joint stock company. The field, which peaked at a production of around 1 mbd in 1983, is now referred to as the Fedorovsko-Surgutskoye and with a current production of 400 kbd it ranks 14th largest in the world. As a sign of the times, perhaps, the new fields that Surgetneftefas is developing are, however, in Eastern Siberia.

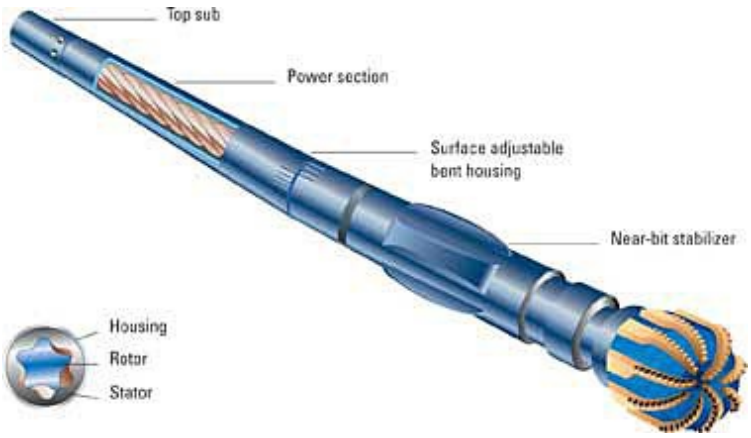
Mamonskoye is run by Yuganskneftegaz and was acquired by Rosneft in 2005. It too peaked at around 1 mbd, though in 1986. The company estimates that in the Khanty-Mansiysk region, its 30 licensed areas still retain a reserve:annual production ratio of 24 years.

This includes the Northern part of the Priobskoye field, the "Pearl of West Siberia," discovered in 1982, and brought on line in 1989, and the Prirazlomnoye field which is the Russian offshore (a third future topic). The Priobskoye field was producing at 650 kbd in 2009, when it was ranked as the 8th largest producer, with plans to further increase production through 2013.



Fields around Khanty-Mansiisk, including Priobskoye (JPT)

The Southern part of the Priobskoye field is being run by Gazprom Neft, the oil branch of the Russian gas company. In 2007, Rosneft produced an average 550 kbd from the Northern half of the field, while Gazprom was producing 127 kbd. Gazprom has about 40% of the field. Production has been helped in more recent times with the use of Schlumberger's advanced down-hole motors and technology.



Down-hole motors used at Priobskoye.

Also in the region, and similarly just coming on line are the wells of the Salym Project, which, last 25 September reached a production record for them of 177 kbd. The oilfields include West Salym

(reserves estimated at 630 million barrels; Upper Salym (reserves estimated at 150 mb) and Vadelyp also at 150 mb.

One of the problems of sustaining production, even given this wealth of opportunity, lies in the need for considerable investment to make it happen.

Coburn (pdf) has pointed out that only 60% of the investment needed in 2009 to sustain the industry was forthcoming, and suggests that the $110 billion needed for exploration and development before 2016, and most of this will have to be spent further East in Siberia and Sakhalin (which will be visited in future posts). He further notes that Lukoil have suggested that $1 trillion will be required to sustain production at current levels. This will include a further production from Western Siberia to the tune of 45.5 billion barrels. Given that most of the larger, older fields are showing depletion levels of 70% or so this is going to have to come from developing a larger number of smaller fields. But that will take an investment that is still doubtful, though Lukoil are investing some $24 billion in downstream operations, showing that they are anticipating getting the oil from somewhere.

Given the size of the Basin, I have not spent enough time today on natural gas too much of which is still flared, so I will return to the region again.