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From: January Boudart <j-boudart@northwestern.edu>
Sent: Tuesday, September 24, 2013 3:44 AM
Subject: A real Fracking story: Tax revenue, \$3.3B; Road Damage, \$7B (to be paid by citizens)

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IS THE BAKKEN PROFITABLE?

<http://energypolicyforum.org/2013/04/07/is-the-bakken-profitable/>

By Deborah Rogers

When the price of natural gas tanked due to severe overproduction by operators in shale gas, operators quickly turned their attention to shale oil. Clearly this was a deliberate attempt to salvage ailing balance sheets saturated with natural gas assets and, no doubt, executives hoped that it might serve as an effective diversion from the mismanagement of resources which had occurred. Hyperbole, which had been considerable with shale gas, now became exponential with shale oil. Unfortunately, such hyperbole has once again proved hollow. Shale oil wells are declining even faster than shale gas and revenues generated are falling significantly short of costs incurred due to shale drilling. The Bakken is a perfect example.

According to well production data filed with North Dakota, daily oil production per well in the Bakken shale has already peaked...in June 2010. *In fact, the number of wells brought online between June 2010 and December 2011 doubled but production did not grow.* So twice as many wells could not add any meaningful amount of production. This is a pattern all too familiar

in shale plays across the board. Older wells decline so rapidly that newer wells simply can't match the concomitant decline. Overall field production, therefore, begins to decline. Shale's pollution, external costs and environmental degradation, however, do not decline but increase with the growth in wells.

Operators have managed to camouflage these severe decline curves by engaging in a frenzy of drilling which makes it appear in the early days of a play that a field is a significant producer. Nevertheless the numbers always catch up with them and it becomes impossible to maintain flat production profiles or even production profiles which might mimic conventional fields. Indeed, based on actual well histories we now know that all shale fields in the U.S. decline somewhere between 30-50% per annum which is considerable.

And there are other problems in the Bakken as well.

In 2010, state government revenues from oil drilling amounted to approximately \$749M. This increased in 2011 to \$2.65B. Operators are quick to point out such growth in revenues and take full credit for it. They are not, however, nearly as keen to expose the external costs of their activities which are being off set in every play onto local businesses and taxpayers. These costs are significant and in some cases are multiples of revenue generated by extraction. Were these costs to be fully accounted for by the industry that generated them, shale wells would prove even less attractive. Given the massive asset writedowns, sales and significant drops in revenue in older shale plays, they are unattractive enough as is which, no doubt, accounts for the sale of shale assets by operators in all older shale plays.

While North Dakota has taken in \$3.3B in tax revenue from drilling since 2010, road damages are now estimated at \$7B as of 2012. But per well production has already peaked. This means the Bakken's days are numbered and revenues will soon begin to decline. Unless, of course, the operators engage in a further drilling frenzy far beyond the current drilling schedule. In which case, road damages and degradation will increase further. This is not a win, win scenario. One aspect is certain, however. The companies that generated these costs will not be covering these costs.

That will be left to the people of North Dakota...and Texas...and Louisiana...and Arkansas...and Pennsylvania...

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16

16

16

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