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**From:** William Burch  
**Sent:** Wednesday, May 12, 2010 5:45 PM  
**To:** kurt.mix@bp.com  
**Cc:** David W Moody; David Barnett; Fred Ng  
**Subject:** FW: Sensitivities vs perm - Blowout Rates and Kill Rates

Kurt,

Although we & SPT Group recognize that OLGA-ABC has some issues with GOR and the black oil model, there's been some difficulty understanding (at least on my part) how the OGLA-WellKill simulations are significantly less than what has been reported by OLGA-ABC.

After a few discussions, there has been several assumptions made which may have significantly helped to reduce oil flow rates:

- 8-1/2" Open Hole – the reservoir modeled in the previous simulations has always been based on 9.876" x 7" casing.
- Wellhead Choke – no equivalent hydraulic ID on the wellhead has been modeled in the previous simulations; it's been assumed that the 22" ID exits directly into the 70' 12" ID diverter
- Effective Riser Choke – no choking end point has been applied in the previous simulations.

It certainly doesn't negate the simulations by OLGA-WellKill nor the validity of the dynamic kill rates if the conditions are a better representation of the flow path. In short, we can't make fair comparisons between apples and oranges.

Bill

**William Burch**  
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**Well Control Engineer**  
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**From:** Ole B. Rygg [<mailto:Ole.Rygg@addenergy.no>]  
**Sent:** Wednesday, May 12, 2010 3:21 PM  
**To:** William Burch  
**Subject:** RE: Sensitivities vs perm - Blowout Rates and Kill Rates

Hi Bill,

I revisited the wellbore pressure drop and observed for the inside casing flow, there is a significant pressure drop when the flow is from the oil zones down behind the 8.5 open hole and 7" casing (narrow annulus)

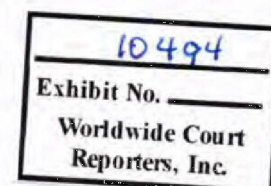
before it turns the corner and flow up inside 7" and further up the 9 7/8 and 9 7/8x5dp to seabed.

I think that is part of the discrepancy you observed. See my previous email.

I tried to find you. But please stop by when you are back, so we can discuss.

all the best,  
Ole

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**WW-MDL-00132085**

WWC015-012928

**TREX 010494.0001**

TREX-010494.0001



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**From:** Ole B. Rygg

**Sent:** 12. mai 2010 22:16

**To:** 'kurt.mix@bp.com'

**Cc:** 'wburch@wildwell.com'

**Subject:** Sensitivities vs perm - Blowout Rates and Kill Rates

Hi Kurt,

see enclosed presentation of results from sensitivity simulations with variable average permeability in the oil sand. I have also included flowing bore hole pressure in absolute pressure and EMW for the same.

Regards,

Ole



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