From: Alberty, Mark W
Sent: Mon Jul 13 16:11:53 2009
To: Morel, Brian P
Cc: Hafle, Mark E
Subject: RE: Stresscage Macondo
Importance: Normal

Brian,
I ran the worst case scenario and here is what I found:
Worst case pore pressure = 2.9 ppg
Overburden = 13.38 ppg
Worst case sand fracture gradient = 8.14 ppg (calculated with a Poisson's ratio of 0.33)
Depletion corrected Young's modulus = 9.30 E5 psi
Hole size = 20"
Deviation = 0 deg
Maximum ECD = 12.2 ppg
In this case the fracture width will be 2477 microns.
We can only StressCage up to roughly 800 microns. We really cannot plan to put 2500 micron size particles through the bit and LWD without plugging both. So if this worst case were to occur, we could not expect to prevent losses using StressCage while drilling.
The real problem here is the low Young's modulus. I calculated Young's modulus from both offset logs (MC 296 #1) and from our global correlations. I cannot make a case to substantially raise Young's modulus to get us out of this problem fracture width.
So I would propose that we go with a max StressCage formulation and hope that we do not see the worst case scenario. If we drill without losses, then great. However, we will need a contingency plan if we do see a case that is greater than 800 microns. Our contingency probably needs to be to drill with fibers through the zone and then make a more permanent repair with EZ Squeeze once the full depleted zone has been exposed. We can also plan to drill to section TD with fibers should we fail to achieve our desired target strength with EZ Squeeze. You might want to consider a water base mud in this interval due to the perceived high risk of significant losses.
Loaded to bear StressCage formulation:

12 ppb BaraCarb 600
8 ppb SafeCarb 500 (Yes, the MI product!)
6 ppb BaraCarb 150
5 ppb SafeCarb 50 (assuming there is no barite)
4 ppb SteelSeal
I know this is probably an unexpected outcome. I am around Houston for the next few weeks and can come discuss if you like.
Regards,
Mark Alberty
Modeling Results:

Stress Cage Formulation Report

Well Macondo (MC 252 #1)
Date: 7/13/2009
Prepared by: Mark Alberty

TVD Depth Feet	Target Strength psi	Fracture Gradient PPG	Hole Size Microns	Product Concentration PPB	Comment
10789	6838	12.2	2477 20.00		Depleted sand at 10789 (12.2 ECD)
10789	6894	12.3	20.00		Depleted sand at 10789 (12.3 ECD)
10789	6950	12.4	20.00		Depleted sand at 10789 (12.4 ECD)

From: Morel, Brian P

Sent: Monday, June 08, 2009 1:51 PM

To: Alberty, Mark W

Cc: Hafle, Mark E

Subject: Stresscage Macondo

Mark,

Can you please put together a stresscage formulation for the Macondo well. Attached is the wellbore schematic and PPFG diagram. The main interval we are concerned with is the 16" hole section, there is potential that the pressured sands shown are depleted (production) and therefore we would need to stresscage them in order to reach interval TD. Let me know what else you need, and I will try to get my hands on it.

Our only other goal would be to push casing points as deep as possible, therefore any help strengthening sands would be useful in achieving this goal.

Thank You,

Brian Morel

<< File: MC252_Macondo_REV03_t35_042309.xls (Compressed) >> << File: Macondo_MC 252_1 Schematic 051609_Rev5_DEFINE.xls (Compressed) >>