



BP's Deepwater Horizon - More Insights Relating to DougR's Comment and Flow Rates

Posted by [Gail the Actuary](#) on June 29, 2010 - 10:30am

Topic: [Geology/Exploration](#)

Tags: [deepwater horizon](#), [gulf of mexico oil spill](#), [oil flow rates](#), [oil spill](#) [[list all tags](#)]

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1. Estimated Oil Flow Rates From the BP Mississippi Canyon Block 252 "Macondo" Well by Oil Drum staff member Art Berman, and
2. BP's Responses to Questions Raised by Commenter "Shelburn" by guest poster Shelburn

Neither of these authors find evidence that the spill could be much worse than is being reported. Shelburn asks readers what additional questions we should be asking BP.

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Estimated Oil Flow Rates From the BP Mississippi Canyon Block 252 "Macondo" Well

by Art Berman ([aebberman](#))

Estimates of flow rates for the BP Mississippi Canyon Block 252 "Macondo" well now range from 1,000-100,000 barrels of oil per day (bopd). Initial estimates were 1,000 bopd. These increased to 3,000 bopd and then to 5,000 bopd. Now the U.S. Geological Survey believes the well is flowing 20,000-40,000 bopd but other experts believe that flow rates may be as high as 60,000 bopd. Some have even suggested rates as high as 100,000 bopd, and others as high as 250,000 bopd. The purpose of this post is to provide a calibration framework for what flow rates are probable.

More than 8,700 wells drilled in the Gulf of Mexico since 1996 were evaluated using publicly-available production data from the Minerals Management Service (MMS). Wells in the deepwater Gulf of Mexico dominate the highest flow rates in this data set. Approximately 4,000 wells have been drilled in water depths more than 1000 ft, and more than 700 in more than 5,000 ft of water during the past 20 years. The Macondo well was drilled in 5,067 ft of water to a total depth of 18,360 ft below sea level.

Historical Context for High Flow Rates in the Gulf of Mexico

The highest flow rate for a single well in the Gulf of Mexico is 46,467 bopd (Figure 1) based on the daily average of the peak month of production.

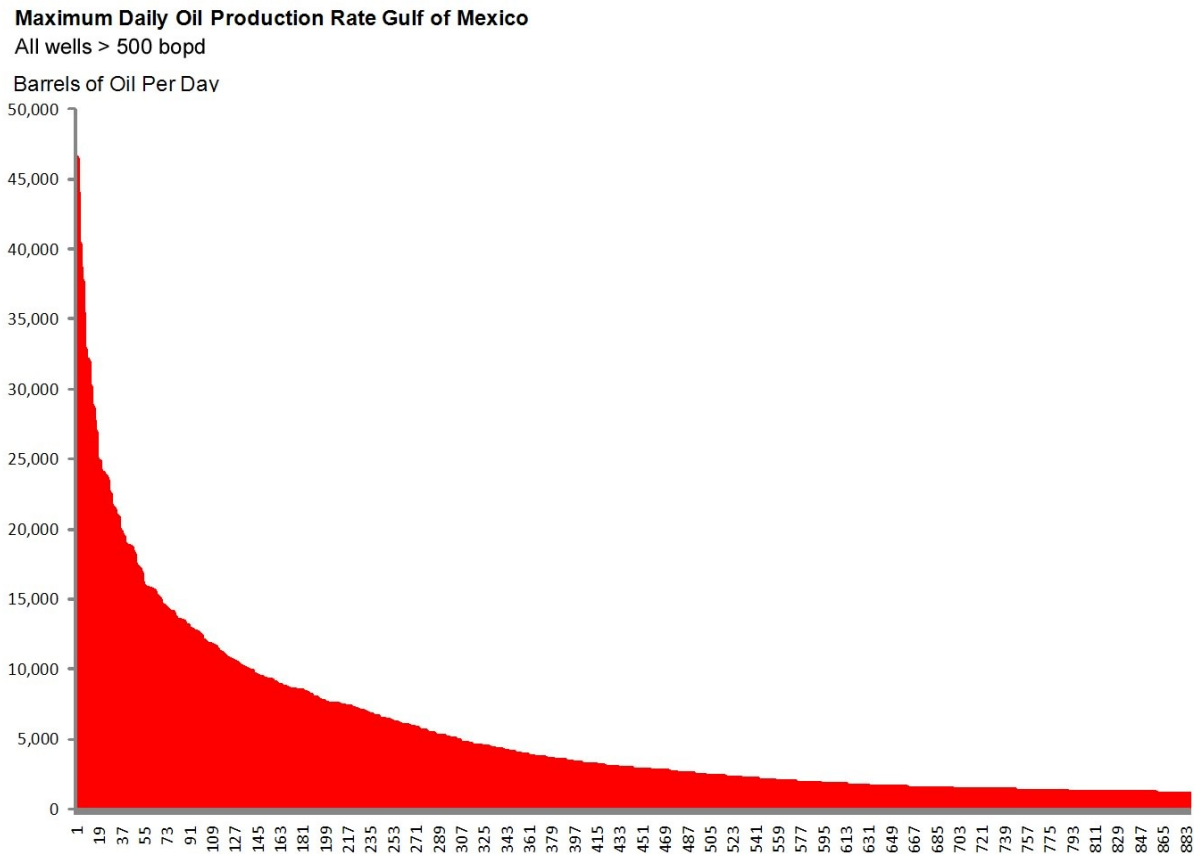


Figure 1. Peak daily oil flow rates for 8,700 wells drilled in the Gulf of Mexico since 1996. Data from the Minerals Management Service.

The mean of the 50 wells with the highest oil flow rates is 27,753 bopd . A probability plot (Figure 2) of these wells indicates that the most likely case is about 27,000 bopd (P50). There is a 10% probability (P10) that a well will produce approximately 37,000 bopd, and a 90% probability (P90) that it will be about 20,000 bopd.

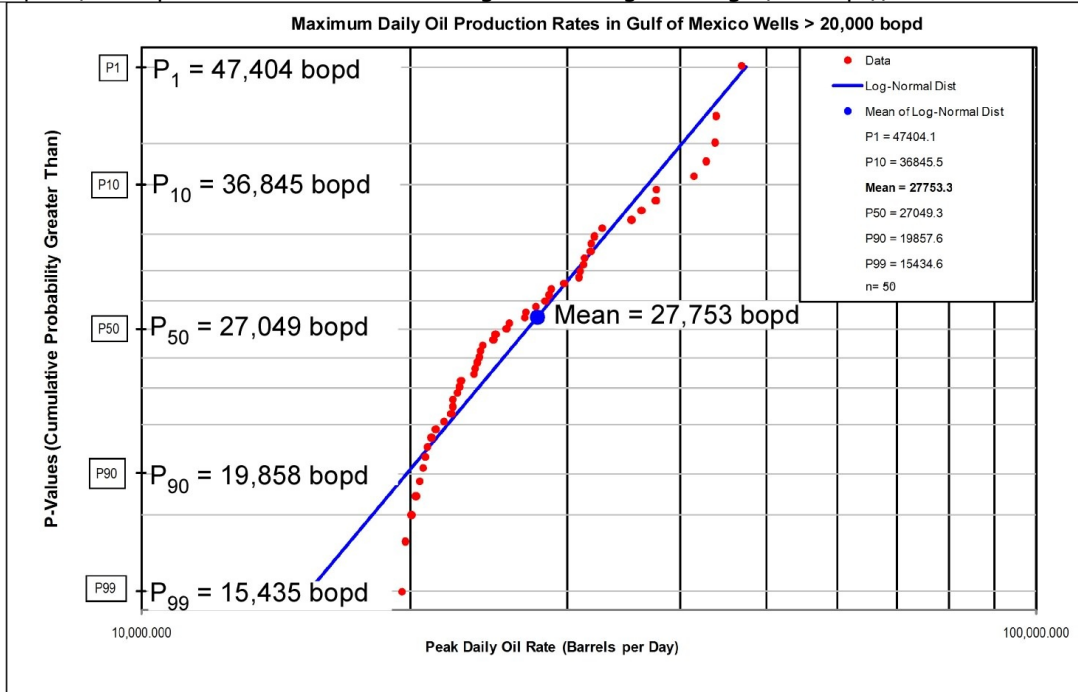


Figure 2. Probability plot of wells with the highest oil flow rates in the Gulf of Mexico. Data from the Minerals Management Service.

There is no historical precedent for a single well producing more than 100,000 bopd. Among historical blowouts, the [highest flow rates](#) known are approximately 100,000 bopd at the Spindletop Field in Texas in 1901, the Midway-Sunset Field in California in 1910, the Long Beach Field in California in 1910, and the Lake Maracaibo Field in 1922. These were all open-hole completions drilled without casing or drilling fluid so they represent maximum unconstrained flow rates.

The BP "Worst Case Scenario" Document

An internal [BP "worst-case scenario" document](#) released June 20 has been mis-interpreted by some to indicate that the company believes that flow rates as high as 100,000 bopd are possible. The [document states](#) that the probable range is 5,000-40,000 bopd. It further states that the maximum theoretical rate is 60,000 bopd. It is important to note that these values represent unconstrained, open-flow rates that might be expected after removing the BOP from the well, and are estimated to be at least 10,000 bopd more than present flow. The 100,000 bopd rate assumes that flow is occurring within the production and casing and around the annulus. It again is an unconstrained rate.

The Most Likely Case

We know that the well is producing at least 25,000 bopd because that much has been collected in a single day. It is impossible to know the flow rate until the well is brought under control and rates and pressures can be measured. It is possible that the well is flowing at a rate 25% higher rate than any well drilled to date (60,000 bopd) in the Gulf of Mexico, but it is not likely. It is less likely that it is flowing at 110% of the rate of the highest rate well so far (100,000 bopd). It is reasonable that it may be among the highest rate wells, and was initially flowing at 40,000-50,000 bopd.

BP's Responses to Questions Raised by Commenter "Shelburn"

by commenter [shelburn](#)

A few days ago Gail posted a copy of a comment I had made the day before as the main posting. It was titled, BP's Deepwater Oil Spill - Response to DougR's Concerns - and Open Thread <http://www.theoil.com/node/6655> and <http://www.theoil.com/node/6659>

In that thread, as a side issue I took BP and the government to task for not releasing more technical information and listed about 10 hypothetical questions I would like to ask BP based on the content of the posting about DougR's claims that the BOP was in immediate danger of tipping over and causing catastrophic damage.

I was quite surprise when yesterday Gail informed me that TOD had received a response, well, a partial response, to the list of questions. Below is the Unified Area Command response:

Subject: RE: Response to DougR's Concerns

Hello,

In your site's June 25 post discussing the Deepwater Horizon oil spill, <http://www.theoil.com/node/6659> guestblogger "shelburn" asked a number of questions. We passed these on to BP and have obtained answers for some of them and thought you would like to share them with your readers:

Q: has the inclination of the BOP changed?

A: No

Q: Are you concerned about the structural integrity of the BOP, wellhead or LMRP?

A: No

Q: What are the ROVs doing when they are looking at the seabed?

A: There are a number of ROVs at work at the site so it depends on which ROV the viewer is referring to. As we prepare to set new equipment and flexible hosing on the seafloor, however, ROVs are often used for route planning. During those exercises the ROVs are used to scan the seafloor to ensure that there are safe and stable places to position equipment and flexible hosing.

Q: Is there any indication of seabed movement at the base of the BOP?

A: No.

If you have any additional questions please let us know.

Sincerely,
Tech. Sgt. Alec Lloyd
Unified Area Command
Deepwater Horizon Response

I was surprised there was a response as, to the best of my knowledge, BP has not previously responded to any internet websites or blogs.

I would have hoped for a more complete and technically oriented response but at the same time am highly encouraged by the fact there was any response at all, and that they answered the most critical questions to refute the wild speculations by DougR that was causing considerable stress to Gulf Coast residents.

The most important fact is that there is no, absolutely no, evidence of washout, subsidence or leakage around the wellhead and blowout preventer (BOP). Without that all DougR's his arguments fall completely apart.

It is interesting the questions they didn't answer. They dropped "casing" from the list of items of structural integrity. It is almost a clear answer that they are concerned about the casing integrity - no real news there for readers of The Oil Drum. Along the same line they did not respond to any other questions about downhole leakage. This is a list of my questions they did not answer:

Describe the "disk failure" at 1,000 feet.

Are you concerned about the structural integrity of the casing?

Describe the formation levels.

What are the current pressure readings inside the BOP?, the historical readings?

What is the little black box the ROVs place on the riser?

Personally, I was most interested in the historical pressure readings at various levels in the BOP and still hope that information will be made public.

I would like to thank BP for this amount of information they did release and encourage them to enlarge the information exchange.

To that end I would suggest The Oil Drum posters to compile a list of technical questions we would like to ask BP. Maybe through the comments section we could narrow down a list of 20 or so questions that The Oil Drum feels that BP could answer that would be most beneficial to transmitting factual data to the general public. Having watched the main stream media mangling of what information they are given, just possibly, having some technical information go through the Oil Drum "review process" would generate a higher quality of communication than we have seen to date.

We know that BP, for legal reasons, is not going to comment about what caused the original blowout or steps that were taken onboard the Deepwater Horizon, and for proprietary reasons they may be reluctant to discuss specifics of various formations. But it would seem that most other data, subsequent to the sinking of the Deepwater Horizon, would be available.



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