

From: SCRU <SCRU@hq.doe.gov>
Sent: Monday, August 02, 2010 3:14:56 PM
To: "paul@hqs.gov" <paul@hqs.gov>
Subject: Re: Rock compressibility

"Actually we have a reasonable idea of the flow rate, assuming no leak to the formation."

From: Paul A. Hsieh <paul@hqs.gov>
To: SCRU
Sent: Mon Aug 02 13:35:16 2010
Subject: Rock compressibility

Secretary Chai:

The shut-in pressure data in the Horner plot do not narrow the uncertainty in the rock compressibility. To obtain a unique value of rock compressibility from analysis of the Horner plot, it is necessary to know the flow rate. For the Macodon well, the flow rate is not known. Assuming different flow rates would yield different rock compressibility values.

The rock compressibility of $12 \times 10^{-6} \text{ psi}^{-1}$ (12 microsi) is based on BP's own estimate, as shown by scanned pages from their presentation on July 9, 2010. (See attached pdf file BP_Presentation_9July.pdf.) The first scanned page shows the cover page of the entire BP presentation ("Shut the Well in on Paper Reservoirs and Risks"). The lower half of the second scanned page contains the title slide of Bob Merrill's presentation ("Reservoir Depletion"). The upper half of the third scanned page shows the reservoir parameters used by BP in their analysis. In particular, the values in red are the values they used. The rock compressibility, C_{rb} , is given as 12 microsi. In the conclusions

I will continue to research on ways to better define the rock compressibility and report my findings to the science team. Please email me if you have additional questions.

Lab testing of a reservoir sample would not yield a rock compressibility that is representative of the entire reservoir. This assessment is widely held in geological sciences.

I will continue to research on ways to better define the rock compressibility and report my findings to the science team. Please email me if you have additional questions.

Respectfully,
Paul Hsieh
U.S. Geological Survey

-----SCRU <SCRU@hq.doe.gov> wrote:-----

To: "paul@hqs.gov" <paul@hqs.gov>
From: SCRU <SCRU@hq.doe.gov>
Sent: 08/02/2010 08:43AM
Subject: Paul A. Hsieh on EARTH MIND BP SCIENCE CALLS - Daily Well Integrity Updates and Information

>
> Paul,

> Are the uncertainties in the rock compressibility being narrowed as we continue forward in Horner time?

>

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