

Displacement Efficiency - Validation with Cement Bond Log

CHALLENGE

Verify displacement efficiency modeling with field results.

SOLUTION

Compare CEMPRO+ displacement efficiency results with a cement bond log from a well with gas migration.

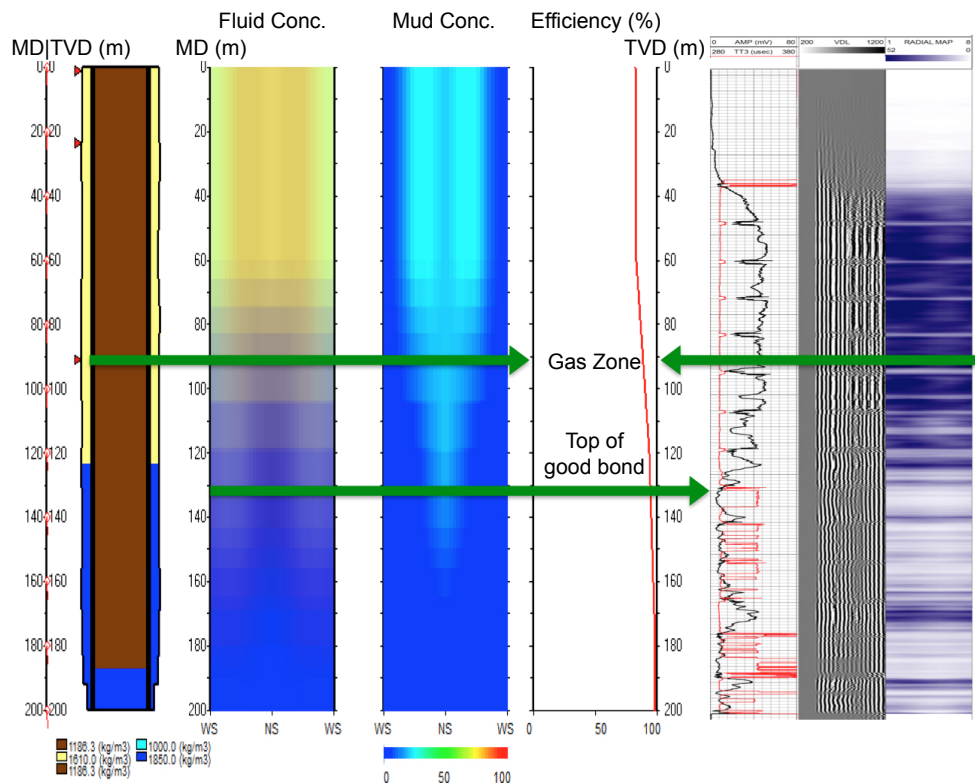
RESULTS

The CEMPRO+ displacement efficiency calculations showed the top of the desired cement concentration at the same height indicated on the cement bond log.

CEMPRO+ was used as part of an analysis to help understand a cement job with a significant amount of mud channeling that resulted in the unplanned communication between a gas zone to surface. The displacement efficiency results were compared to the cement bond log to validate the post-job analysis conducted.

The results from CEMPRO+ show excellent mud displacement for the bottom 30% of the annulus, with intermixing of fluids above. The upper portion of the cement column showed significant intermixing between the lead cement slurry and drilling mud when considering both the CEMPRO+ simulation outputs and the cement bond log. Both the simulated and measured results show the same height of the cement column prior to the section with mud channeling, helping to understand why gas migration occurred in this well.

The comparison between the displacement efficiency results generated by CEMPRO+ and a cement bond log continues to validate the program's results. Running comparisons between field data and software calculations, Pegasus Vertex, Inc. is confident of the reliability of the mud displacement efficiency calculations within CEMPRO+, though continuing development is constantly being considered to improve the quality of these simulations.



The comparison between the displacement efficiency results generated by CEMPRO+ and a cement bond log

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