The Pumpability of Fly Ash Slurry for Plugging Abandoned Wells Using Coiled Tubing

Subhash N. Shah[1], Yeon-Tae Jeong[2]

[1]Stephenson Chair Professor
Mewbourne School of Petroleum and Geological Engineering
The University of Oklahoma, Norman, OK 73069, USA
[2]Graduate Student
Mewbourne School of Petroleum and Geological Engineering
The University of Oklahoma, Norman, OK 73069, USA

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ABSTRACT

Because of environmental and economical concerns, in resent years the utilization of fly ash has been researched widely. Class C fly ash is more cementitious material than Class F fly ash due to the higher lime content. The primary importance of plugging to abandon wells is to prevent contamination of groundwater aquifer by surface water, oil or gas seepage, or brine formation below the groundwater aquifers. Cement is the present plugging material. However, cement can be replaced by Class C fly ash. Some research has already proven that it is possible to use fly ash for plugging abandoned wells.

The objective of the study is to verify pumpability of fly ash slurry. First ,fly ash slurry properties are investigated in the laboratory. Thickening times are measured to estimate needed pumping time. To know fly ash slurry properties, rheology of fly ash slurry is investigated at various temperatures and pressures by Nordman rheometer and Bohlin rheometer. Once fly ash slurry properties are investigated the frictional pressure loss tests are performed through coiled and straight tubing. From these tests, pumpability of fly ash slurry is successfully verified and then a user friendly correlation is developed for fly ash slurry. The results of this study will stimulate economical and environmental use of fly ash slurry.

[1] subhash@ou.edu, Tel: 405-325-6871, Fax: 405-325-2958
[2] Yeon-Tae.Jeong-2@ou.edu, Tel: 405-325-1102, Fax: 405-325-2958