

Rigless Surface Squeeze Using WellLock® resin

## WellLock® resin - Rigless micro-channel remediation

Location: Australia

**CHALLENGE** – A customer in New South Wales, Australia had an onshore coal seam gas well which had undergone an unsatisfactory plug-to-abandon process by a third-party cementing services company. Persistent gas pressure observed at the wellhead necessitated a novel technical solution to render the well safe for wellhead removal and permanent abandonment.

While monitoring the well prior to cutting off the wellhead, gas bubbling was observed in the annulus between the 7-in. and 9 5/8-in. casing. Reservoir gas appeared to have migrated through plug-cement barriers inside the 7-in. casing and in the annular space between the 7-in. and 9 5/8-in. casing from earlier perforation/squeeze plug and abandonment operations. Pressure at the wellhead was building up at a rate of 80 psi in 17 hours. The well required additional remedial work to seal the micro-channel and allow safe, permanent abandonment.

**SOLUTION** – An injectivity test was performed with freshwater pumped from the surface into the 7-in. x 9 5/8-in. casing annulus. The test resulted in an observed injection rate of 11 liters (3 gallons) per hour at 3000 psi pressure. This data confirmed existence of a very narrow micro-channel.

Halliburton recommended WellLock® resin to be squeezed into the annulus since conventional cement slurries would have a limited chance of penetrating and reliably sealing off the flow path. Unlike even microfine cement slurries, WellLock resin is a low viscosity, particle-free fluid with adjustable thickening time. Once set, the resin develops extremely high bond strength with compressive strength in excess of virtually any oil field cement. The bond is

exceptionally strong and flexible. In addition, WellLock resin is chemically inert and resistant to detrimental effects from acid, alkaline and hydrocarbons. All these properties combine to make WellLock resin the optimum solution for this problem.

A spread of mixing and pumping equipment was mobilized by Halliburton to perform the small volume job as part of a rig-less operation. The squeeze job was executed as per plan with no operational or HSE issues. Maximum injectivity rate achieved while squeezing the resin was 3.5 liters per hour at 3000 psi.

**RESULT** – After a shut-in of 10 days the wellhead was checked again and no pressure was observed on the surface, indicating the micro-channel had been sealed. Further verification was derived from an additional pressure gauge, which was installed at a depth of 3 m (10 ft) below surface. Readings confirmed zero pressure in the treated annulus allowing the customer to approve the final phase of well abandonment.

A single squeeze job using WellLock resin successfully resolved the gas micro-channel issue that remained after the previous plug-to-abandon attempt by a third-party cementing company.



*WellLock® resin can act as an annular barricade against water and gas leaks.*

**For more information on WellLock® Resin system,  
please call your local Halliburton representative or email us at [cementing@halliburton.com](mailto:cementing@halliburton.com).**

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