TAM INTERNATIONAL

CASE HISTORY

Unconventional Resources | Three Stage Cementing System

ZONAL ISOLATION IN COAL SEAM GAS WELL USING THREE-STAGE CEMENTING SYSTEM

TAM inflatable packers along with stage tools provided zonal isolation by successfully bringing cement from shoe to surface across a permeable formation prone to severe drilling fluid losses.

CHALLENGES: Regulatory requirements for coal seam gas wells in Queensland, Australia, dictate that all surface casings must be cemented from shoe to surface and all aquifers must be isolated with casing and cement to ensure zonal isolation. The customer drilled a well at an altitude of approximately 1,640 ft. (500 m) above sea level. This altitude is considered high for the location, which leads to overbalanced drilling across the permeable Precipice Aquifer, causing severe to total losses of drilling fluids. A wide range of conventional LCM, light-weight cement, and two-stage cement operations have been used with limited success.

SOLUTION: A three-stage casing cement job was designed by the customer, TAM, and a partner to bring cement from shoe to surface across permeable formations and total loss zones in 12 1/4 in. (311.1 mm) hole. The system consists of 9 5/8 in. (244.5 mm) inflatable Casing Annulus Packers, compatible hydraulic and mechanical stage tools, and float equipment installed on the 9 5/8 in. (244.5 mm) surface casing. The first stage was done from total depth to top of the aquifer. This was followed by the second stage, which used an inflatable Casing Annulus Packer as a cement base and a hydraulic stage tool to perform the cementing operation from the top of the aquifer to a depth of 361 ft. (110 m). The third stage of the cementing operation, which brought the cement all the way to surface, used a mechanical stage tool with an inflatable packer as a cement base. Well-laid pre-job planning, detailed procedures, and careful attention during on-site execution were key to the success of the multi-stage operation.

RESULTS AND BENEFIT: By providing a custom solution, TAM was able to meet the objectives of the customer where other conventional methods had not been successful. The system provided a well that met all objectives and Queensland government regulations while avoiding excessive costs due to fluid losses and exotic cements.