



CASE HISTORY

Unconventional Resources: Heavy Oil

FREECAP®GT – Swellable Packers

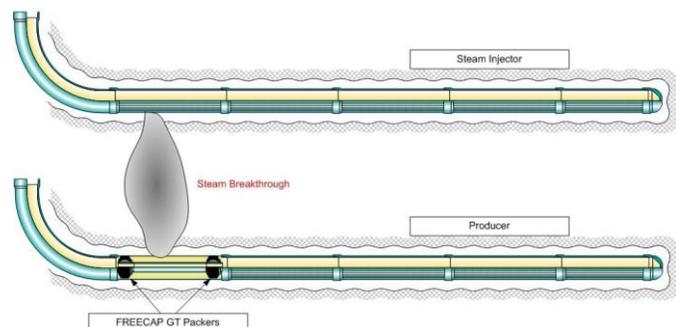
SCAB LINER ISOLATES STEAM BREAKTHROUGH IN HEAVY OIL SAGD COMPLETION

FREECAP®GT Swellable Packers combined with scab liner enables Canadian operator to produce sand free after successful isolation of early steam breakthrough



CHALLENGE: A major Canadian operator with operations in Steam Assisted Gravity Drainage (SAGD), had a number of wells that were producing high steam to oil ratios as well as sand. The sand was detrimental to the operation of the down hole pumps and resulted in wells being shut in and in many cases abandoned. A SAGD operation is when two horizontal wells are drilled, one above the other. The upper well in the well pair is the steam injector and the lower well is the oil producer. Steam is pumped into the reservoir heating the oil up thereby allowing it to flow. Due to hydraulics and frictional losses, the tendency is for most of the steam injection to exit the well at the heel. This results in steam breakthrough, erosion of the screens and eventually sand production in the producer requiring the operator to shut-in the well.

SOLUTION: TAM International worked with the client to design and deploy a scab liner combined with two of TAM's FREECAP GT packers. One of the major technical hurdles was to have a water swell elastomer that would withstand high temperatures and remain swelled during oil production. The TAM water swell FREECAP GT packer withstands high temperatures, up to 575°F (302°C) associated with SAGD operations. The work string was hung off at surface and the packers were allowed to swell for three weeks. After three weeks, the packers were tested by pulling six thousand lbs (2.72 metric tons) of tension. A ball was then dropped and the work string was released and retrieved. A pump was installed in the producer, and injection was started. Once the well pair was up and running, the well was producing as expected with no sand production, indicating the scab liner was working as expected.



The FREECAP GT packer is set at the top and bottom of the scab liner. The well is now producing sand free.

RESULT AND BENEFIT: US\$ 5 Million

The cost to replace a pair of wells is in excess of US\$5 million. By applying TAM's solution the operator has realized sand-free production. Eight additional installations have been scheduled for this operator.