

An Investigation of the Plugging Mechanisms in a Slotted Liner from SAGD Operations

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A slotted liner recovered from the well 07P05 located in the McMurray formation of the Long Lake area, Canada, where Nexen Inc. is producing bitumen with the Steam Assisted Gravity Drainage (SAGD) technology, was investigated in the study. The study was aimed to determine the conditions of the liner and assist Nexen in identifying the mechanisms of the liner failure. The study included a physical examination of the liner, direct measurements of the liner aperture, permeability measurements, epoxy impregnation of the selected sections of the liner, and the analysis of plugging material and surface of slots.

The study results show that the corrosion and/or plugging and/or poor slot specification result in effective apertures being different than the specification. The study also shows that the pressure drop across the liner sections are small, likely due to removal of the surface plugging clay and fines. The plugging material consists of a large amount of corrosion products, significant amount of iron sulphide, clay fines (mostly kaolinite), and some quartz grains. The examination of the slots show that films of the plugging material consisting of predominantly corrosion products and clay, gradually choking slots.