

# Increase Oil Recovery Using Crosslinked Gels to Block Waterflood Hot Streaks

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## *Abstract*

*Waterflood operations can become inefficient over time due to channeling or 'hot streaks' between injection and production wells. If the injected fluid flows through the formation uniformly, the operation will be efficient. However, permeability is rarely uniform throughout a formation. To improve uniformity of the injected fluid flow, it must be diverted away from the hot streaks into oil-containing areas. Water conformance treatments are used to reduce or block the permeability of hot streaks. Fluids that flow exclusively through high-permeability zones reduce recovery of hydrocarbon from lower-permeability areas of the formation. By blocking hot streaks, fluid is forced into low-permeability zones of the formation, enhancing the recovery of oil from and extending the economic life of the field.*

*This case study will discuss successful conformance treatments of two waterflood injection wells in the eastern Alberta region. Crosslinked polymer gels were used as a conformance treatment to reduce the permeability of channels directly connecting waterflood injectors with offset producers.*

*Abnormal water cuts were observed at the treatment battery, implicating hot streaks existing between the two injectors and specific offset producers. Following a conformance treatment of the injectors, these offset producers experienced increased oil production and decreased water cuts from the date of treatment, in late 2013, to present.*

*Of the eight wells suspected of communicating with the two treated injectors, three saw oil production increases from 100 to 1200% above production rates prior to treatment. The other offset producers saw minimal or no benefit from this treatment.*

*Conformance treatments are an effective means of optimizing water flow through a reservoir, enhancing water flood operations. These treatments can extend field production life, delaying or mitigating the need for polymer flood or other costly enhanced-oil recovery (EOR) techniques.*

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