

Enhancing SAGD Bitumen Production Through Conductive, Convective and Radiant Heating

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Abstract

The majority of the production from steam-assisted gravity drainage (SAGD) projects is sourced from the steam-swept portion of the reservoir; however, conductively, convectively and radiantly heated bitumen intervals can also provide a significant contribution to total reservoir recovery. Recovery of conductively heated bitumen appears to result from a combination of gravity flow providing downward movement; and injection of non-condensable gas or methane - providing gas push. Mud-dominated inclined heterolithic stratification (IHS), which commonly acts as a barrier for steam, may not act as a barrier for solution gas or co-injected gas introduced into the reservoir during SAGD operations. Thinking in three dimensions, as the steam chambers of a series of well pairs coalesce, conductively heated bitumen within sand-dominated IHS can flow down-slope to the producer at the base of the well pair, or be produced from an adjacent well pair, depending on the geometry and dip direction of the IHS. Further studies are recommended to verify potential recovery factor increases and optimize production during all stages of SAGD operations.