

# **Diagenetic History of a Hydrocarbon-Bearing Large-Scale Sand Injectite (Santa Cruz, California)**

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Numerous large-scale bitumen-saturated sand injectite complexes occur in the Santa Cruz area (Central Coastal California). They were fed by the shallow-water coarse-grained deposits of the Santa Margarita Sandstones and are emplaced in the hemipelagites of the upper Miocene Santa Cruz Mudstones, a regional caprock. The reservoir-scale injectite complex which occurs at Yellow Bank Creek, ca. 10 Km north of Santa Cruz, consists of a dyke-sill complex a few hundreds of meters wide. It comprises resistant sandstones pervasively cemented by ferroan dolomite, which are intricately interfingering with limonite-stained sandstones. Bitumen traces are preserved in the dolomite cements.

Field observations and petrographic analyses were combined to investigate this complex arrangement of different cements with the purpose to understand the local diagenetic history and the general role of injectites in fluid migration. Cathodoluminescence and scanning electronic microscopy reveal incipient dolomite corrosion of the cemented sandstones and common small residual dolomite crystals in the limonite-stained sandstones. The outcrop geometry of the cemented injectites is similar to those of limestone karst systems.

Hydrocarbon is therefore believed to have preferentially migrated along the permeable pathways supplied by the injectites in the caprock. Hydrocarbon oxidation and biodegradation supplied the dolomite which pervasively cemented the entire injectite complex. Following uplift of the area, subaerial weathering leached away and altered the Fe-dolomite into limonite staining. This study underscores the role of injectites in focusing basinal and meteoric fluid flows and the importance of the diagenetic history in controlling hydrocarbon migration.