

Depositional and Chronostratigraphic Relationships of the Lower Mississippian (Osagean) Reeds Spring Formation

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The Reeds Spring Formation, named for exposures near Reeds Spring in southwestern Missouri, is a time-transgressive formation that ranges in age from lower to upper Osagean (upper Tournaisian-basal Visean). The formation is mapped on the surface as well as in the subsurface of SW Missouri, NW Arkansas, southern Kansas, and northern Oklahoma, and its represent diachronous prograding carbonate wedges originating from the Burlington Shelf. This study is based analysis of some 100 surface outcrops of the western flanks of the Ozarks and subsurface cores of the adjacent basin in southern Kansas and northern Oklahoma. The Reeds Spring is dominantly a carbonate mudstone with interbedded chert at the base and middle that gradually is replaced by slightly more fossiliferous facies in its upper part that has in the past been mapped as the Elsey Formation (in SW Missouri). We do not recognize the Elsey Formation, however, because its lower contact with the Reeds Spring Formation is highly gradational and difficult to trace with consistency. The Osagean “chert reservoirs” of the midcontinent typically are comprised of chert residuum, spiculite, and tripolites developed within various wedges of the diachronous Reeds Spring Formation (and also in overlying Osagean and Meramecian rocks).

The lower Reeds Spring is characterized by dark, organic-rich carbonate mudstone with interbedded chert that is multi-generational, bedded, nodular or anastomosing. The chert commonly follows burrow systems in the lower and middle parts, and also replaces brachiopods and bryozoans in the upper portions . The Reeds Spring is interpreted to represent deposition in a low oxygen regime at its lower part with only siliceous sponges and rare trace fossils as its only benthonic component in addition to the pelagic fossils notably conodonts. The upper Reeds Spring Formation in its type area around Branson, Missouri is transitional with the overlying Burlington-Keokuk, having fossiliferous wackestones This occurs in some of the older carbonate wedges. In the younger carbonate wedges, the upper Reeds Spring is still dominantly carbonate mudstone with little evidence of shallowing. The Reeds Spring represents the more distal facies of the wackestone dominated outer shelf Pierson Formation, and further updip, the high energy grainstone-dominated Burlington-Keokuk Formation.