Stratigraphic Framework of the Deadwood Formation of North Dakota

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Abstract

The North Dakota Geological Survey (NDGS) is currently conducting studies of the Cambro-Ordovician Deadwood Formation (Deadwood) because of the increased interest in carbon dioxide storage in underground saline aquifers. These studies are being performed to develop a detailed stratigraphic framework for the Deadwood in the Williston Basin. Three detailed cores are presented with one consisting of a complete core across the entire Deadwood interval from Oliver County, North Dakota (NDIC #37672–J-ROC1 1). Four subsurface cross-sections utilizing these cores for control are also presented.

The Deadwood Formation consists of marginal and shallow marine sedimentary units; dominantly thick, porous, and permeable sandstone and limestone that are present at great depths and thus are ideal for carbon dioxide sequestration. The Deadwood represents two 3rd-order depositional sequences deposited in an overall 2nd-order transgressive-regressive cycle in the Late Cambrian and Early Ordovician Periods. In general, the lower sequence (member A) represents the initial sea-level rise during the Cambrian and consists of fluvial-deltaic and eolian deposits that give way to more marginal marine (member B) and nearshore progradational deposits (members C-F) that shallow upwards as represented by 4 parasequences of the highstand normal regression of the upper sequence.

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