

Magnetostratigraphy of the Santonian-Campanian Lea Park Formation (including the Alderson Member), southern Alberta and Saskatchewan, Western Canada Sedimentary Basin

Andrew J. Mumpy, Octavian Cateneanu, and John F. Lerbekmo
University of Alberta

The Lea Park Formation of the Western Canada Sedimentary Basin is a regionally extensive succession of marine sediments deposited in the Western Interior Seaway. The unconformity-bounded Alderson Member (lower Lea Park Formation) contains unconventional accumulations of shallow biogenic gas which constitute the largest gas fields ever discovered in Canada. Particular problems persist with respect to chronostratigraphic relationships within the Lea Park, and numerous regional unconformities of unknown (or speculative) origin occur within the unit. Therefore, there is a fundamental need for an improved time framework based on empirical data. Magnetostratigraphic samples were taken from selected intervals of 10 cores located in both proximal and distal sectors of the basin, several of which constitute important reference sections. The position of the 33r- 34n polarity chron boundary was determined to be present within the lowermost Alderson Member in south-central Alberta, therefore an absolute age of $\sim 83.5 \pm 0.5$ Ma may be inferred at this stratigraphic level. A new time line is thus established between the 33r-34n boundary discovered here in distal deposits and its previously documented occurrence near the top of the proximal Milk River Formation in southernmost Alberta. This finding holds major implications for genetic-stratigraphic modeling of the Alderson because: 1) time-equivalency is demonstrated between the lower Alderson and part of the proximal Milk River Formation; 2) time-equivalency is demonstrated between the upper Alderson and a ~ 2.5 Ma hiatus documented in southernmost Alberta and northern Montana; 3) the 33r-34n polarity chron boundary intersects the projected position of the basal Alderson unconformity.