

Inferred Exposure of a “Pop-Up” Structure in the Outer Foothills, Crowsnest Pass Area, Alberta

Glen S. Stockmal

Natural Resources Canada, Geological Survey of Canada (Calgary)
3303 33rd Street NW, Calgary, AB, T2L 2A7

ABSTRACT

Recent mapping in the Blairmore east-half map area (Stockmal and Lebel, GSC Open File in preparation) has delineated a “pop-up” structure transected by the Crowsnest River. At scenic Lundbreck Falls, the sub-horizontal attitude of the Virgelle Formation (Milk River Group) is unusual in comparison to fault-bounded slices to both the east and west, where strata display steep to moderate dips more typical of Foothills structures. The relatively broad (750 m across strike) flat-lying panel exposed at Lundbreck Falls is bounded downstream to the east by a foreland-directed thrust placing Virgelle Formation on Lundbreck Formation (Belly River Group). To the west, this panel is overridden by a steeply west-dipping foreland-directed thrust carrying Milk River and Belly River strata in its hanging wall. Stratigraphic offset across this thrust fault is apparently small to negligible at the Crowsnest River, but increases at higher elevations to the north and south. Map and stratigraphic relationships suggest that at the river and adjacent low elevations the sub-horizontal panel is actually bounded to the west by a cryptic west-directed backthrust, that is overridden up-slope by the foreland-directed fault just described. These features comprise a “pop-up” structure, similar to those interpreted elsewhere within the triangle zone in the subsurface. The inferred backthrust is not alone in this area. Two kilometres downstream, the well-exposed section of Milk River Group strata at the popular “Lundbreck transition outcrop” lies in the east limb of an upright anticline. The hinge of this fold is removed to the north by another west-directed backthrust.