BARONS SANDSTONE, SOUTHERN ALBERTA

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The base of the 'Fish Scale Sandstone' or 'Fish Scale Zone' is used as a stratigraphic marker throughout a large area of the western Canadian plains. It occurs within the Colorado Group, and has been commonly used in the subsurface to mark the base of the Upper Cretaceous. Locally developed lenses, informally called the Barons Sandstone, occur about 12 metres above the base of the Fish Scale Zone. These oil-bearing pods, of small areal extent, occur within the unit.

A typical sequence of Barons Sandstone has at the base a black silty shale with lenticular sandstones exhibiting starved ripple cross-lamination. Overlying these rocks, and in sharp contact with them, is a medium to coarse-grained sandstone which exhibits high angle crossbedding, and contains shale rip-up clasts. This sandstone becomes finer grained upwards, grading into interbedded fine-grained sandstone and shale, and then into typical dark grey Colorado shale. The section is wholly marine, implying shelf or basin deposition in water of unknown depth. Deposition is postulated to be related to storm action in an anaerobic environment, at an unknown distance from shoreline.

The sandstones are made up of chert, quartz, and abundant fish scales. In non-productive zones, poikilotopic calcite is the dominant cement, whereas in productive zones quartz overgrowths are the main cementing agents. A typical pay zone in the Barons Sandstone is about 1 metre thick, has porosity of up to 22 per cent, and permeability of several hundred millidarcies.

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