

## **A Small Lowstand Delta in the Bluesky Formation (Lower Cretaceous), Gold Creek Field Area, Peace River Arch, Alberta**

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The Bluesky Formation in the Peace River Arch area of west-central Alberta lies at the top of the Lower Mannville Subgroup. The Bluesky represents the final marine phase of the Lower Mannville 3rd order transgressive cycle, it overlies the floodplain deposits of the Gething formation, and is overlain by Upper Mannville marine shales.

In this region (T66-78, w6) the Bluesky consists of a series of marine cycles, each coarsening upwards from offshore shales to very fine-grained storm-dominated middle shoreface sands. There are up to four of these stacked shoreface cycles, each prograding from south to north with east-west shoreline trends. Together they form a prograding highstand systems tract of probable 4th order cyclicity.

In T67 R5-6w6 several anomalous facies occur within the Bluesky succession. These facies are: 1. Heavily bioturbated fine-grained muddy sand with many disrupted shale laminae and coaly fragments, these are interpreted as marine delta front deposits. 2. Medium-grained cherty sands forming channels up to 6 m in thickness. These typically contain high-angle bedforms, large troughs, current ripples, minor bioturbation and a high proportion of coaly debris. These are interpreted as deltaic distributary channels. 3. Thin channel sands, usually less than a metre in thickness, interbedded with muddy sands that have been completely bioturbated by assemblages dominated by a few ichnogenera such as *Teichichnus*, *Rosselia*, and *Ophiomorpha*. These are thin distributary channels and abandoned channels formed in an environment lateral to the main deltaic distributary.

The deltaic facies overlie a local sequence boundary at mid Bluesky level and have been top-truncated by an overlying transgressive unconformity. The preserved delta is approximately one township in size, and has a maximum thickness of 10m. The main distributary facies has a north-south trend, and is the highest quality reservoir facies in this part of the Gold Creek field area.