The Bakken Formation, an Upper Cretaceous series of fluvial, estuarine, and deltaic sandstones and siltstones, is a world-class hydrocarbon resource that has seen renewed interest in recent years.

The Bakken is divided into three members: the lower, middle, and upper. The middle member contains the main hydrocarbon-producing zone and is divided into three lithofacies:

1. **Lithofacies 1**: A calcareous, slightly bioturbated siltstone with a sharp upper contact and a gradational lower contact. It is a typical uppermost member lithofacies.

2. **Lithofacies 2**: A fine-grained sandstone with a sharp upper contact and a gradational lower contact. It is a typical lowermost member lithofacies.

3. **Lithofacies 3**: A well-cemented, massive siltstone with a sharp upper contact and a gradational lower contact. It is a typical middle member lithofacies.

The Bakken Formation in Montana has a higher porosity in producing wells despite generally low measured porosity values due to the high amount of clays within the section. Cross-plotting of porosity values to core analyses suggests porosity values are generally lower than those measured in core.

The Bakken Formation is stratigraphically transitional from the lower Bakken shale and transitional to the upper Bakken shale. Lithofacies 2 overlies lithofacies 1 and is referred to as the "Sanish Sand." The "Sanish Sand" is marked by a more limited areal distribution than the Bakken and is tied to dissolution of the Prairie Salt. Along the southern limit of the Bakken, the "Sanish Sand" is transitional to the upper Bakken shale.

The middle member of the Bakken Formation reaches a maximum thickness of 140 feet just to the east of the Nesson Anticline. It consists of a sequence of highly argillaceous, well-cemented siltstones and sandstones. Seven lithofacies can be recognized in this sequence in North Dakota, based on log signatures.

Exploration activity is focusing once again on the Bakken Formation in the Williston Basin. The current activity began in Richland County, with the majority of the activity occurring along the northern part of the basin. This area is characterized by a series of anticlines where the Bakken Formation appears to be more stratigraphically and structurally favorable for hydrocarbon accumulation.

Middle Member Lithofacies

- **L1**: Calcarenite, sharp to faintly bioturbated, calcareous, slight to no bioturbation.
- **L2**: Sandstone, tripartite division with upper and lower third wavy and flaser bedded silty sandstone gradational to and from the overlying and underlying lithofacies.
- **L3**: Siltstone, massive, dense, mottled, dolomitic, argillaceous, grey-green, fossiliferous, disseminated pyrite, rhythmites up to 15 cm thick in lower half of section (occasionally fossil-rich), slightly bioturbated, contact with upper member sharp.
- **L4**: Siltstone, massive, dense, mottled, dolomitic, argillaceous, grey-green, fossiliferous, disseminated pyrite, rhythmites up to 15 cm thick in upper half of section (occasionally fossil-rich), slightly bioturbated, contact with lower member sharp.