RESOURCE POTENTIAL OF THE TYLER FORMATION
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The Tyler Formation is a complex geologic unit that spans much of the northern Great Plains of North America. It is composed of a variety of sedimentary rocks, including sandstones, mudstones, and shales, which were deposited in a continental margin setting during the Late Pennsylvanian to Early Permian period. The Tyler Formation is known for its significant hydrocarbon potential, particularly in the Bakken Formation, which is a tight oil reservoir located in the Williston Basin.

The Tyler Formation is characterized by several key features that contribute to its resource potential:

1. **Source Rocks:** The Tyler Formation is thought to be a significant source rock due to the presence of organic-rich mudstones and shales. These rocks contain a variety of kerogen types, which are crucial for oil generation.

2. **Reservoir Rocks:** The Tyler Formation contains a variety of reservoir rocks, including sandstones and carbonates, which are capable of holding hydrocarbons.

3. **Overpressure:** Many areas within the Tyler Formation are overpressured, which can contribute to the entrapment of hydrocarbons.

4. **Migration Routes:** The Tyler Formation is thought to be a key migration pathway for hydrocarbons moving from source to trap regions.

5. **Seals:** The Tyler Formation is often found below faulted or unconformity-sealed traps, which can act as effective seals.

6. **Tectonic Setting:** The Tyler Formation is found in a tectonically active region, which can contribute to structural traps and increased reservoir pressures.

The Tyler Formation has been studied extensively for its resource potential, with numerous wells drilled to test its hydrocarbon potential. However, the complexity of the Tyler Formation and its geologic setting make it a challenging target for exploration and production.

**Figure 3:** Horner plot of pressures measured during shut-in periods of a well in the Tyler Formation. The plot is used to determine the formation fluid pressure, which is critical for understanding the reservoir properties and fluid flow within the Tyler Formation.

**Figure 4:** A kerogen quality diagram showing the proportion of different kerogen types in the Tyler Formation. This diagram is used to evaluate the potential of the Tyler Formation as a source rock for hydrocarbons.

**Figure 5:** Time-transposed seismic data from the Tyler Formation. This data is used to map the distribution of Tyler fields in southern Billings, Slope, and Stark counties, providing insights into the potential for hydrocarbon accumulation.

**Figure 6:** A modified van Krevelen diagram that classifies kerogen based on the Hydrogen Index (HI) and Oxygen Index (OI). This diagram is used to evaluate the quality of the kerogen in the Tyler Formation.

**Figure 7:** A frequency diagram showing the distribution of kerogen types in the Tyler Formation. This diagram helps to identify the most abundant kerogen types and their potential as source rocks.

**Figure 8:** A Time-Temperature Index (TTI) map of the Tyler Formation, which is used to determine the thermal maturity of the kerogen in the Tyler Formation. This map is critical for identifying areas that have been thermally matured beyond the threshold for hydrocarbon generation.

**Figure 9:** A modified van Krevelen diagram that classifies kerogen based on the Hydrogen Index (HI) and Oxygen Index (OI). This diagram is used to evaluate the quality of the kerogen in the Tyler Formation.

**Figure 10:** A modified van Krevelen diagram that classifies kerogen based on the Hydrogen Index (HI) and Oxygen Index (OI). This diagram is used to evaluate the quality of the kerogen in the Tyler Formation.

References:


The Tyler Formation continues to be a topic of interest for geologists and petroleum engineers, as its resource potential remains largely unexplored.