Correlation of Fluid Overpressure and Hydrocarbon Presence in the Tyler Formation, North Dakota

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**OVERVIEW**

The Tyler Formation in North Dakota contains several source rocks with different thermal histories that are spatially extensive and genetically continuous. These source rocks have high hydrocarbon generation potentials and may have been responsible for overpressuring a significant portion of the Tyler Formation reservoirs. A cross-section of the Tyler Formation with a 2D seismic volume shows that the Tyler Formation reservoirs contain areal dimensions of over 100 square miles in the Williston Basin of eastern North Dakota.

Fluid pressure can be used as an effective method for determining whether source rocks are mature and whether conditions are optimum for oil and gas migration and accumulation. One of the main purposes of open hole DST's is to determine the productive capacity, pressure, permeability, and/or extent of a hydrocarbon reservoir. The purpose of this study is to map the extent of fluid overpressure and examine areas of overpressure in the Tyler Formation.

**METHODS**

The Terzaghi method (Horner, 1951), which extrapolates a formation's fluid pressure using DST time-pressure data (e.g., Fig. 2), was used to determine the productive capacity, pressure, permeability, and/or extent of a hydrocarbon reservoir. The pressure build-up method can be used to determine the productive capacity, pressure, permeability, and/or extent of a hydrocarbon reservoir. The pressure build-up method is based on the principle that the fluid pressure in a reservoir is equal to the sum of the fluid pressure at the boundary and the fluid pressure at the depth of the reservoir. The fluid pressure at the boundary is equal to the sum of the fluid pressure at the surface and the fluid pressure at the depth of the reservoir.

**RESULTS**

The Tyler Formation is divided into three zones: the Tyler Top zone, the Tyler Middle zone, and the Tyler Bottom zone. The Tyler Top zone is the uppermost zone and is characterized by high temperatures and high fluid pressures. The Tyler Middle zone is the middle zone and is characterized by intermediate temperatures and intermediate fluid pressures. The Tyler Bottom zone is the lowermost zone and is characterized by low temperatures and low fluid pressures.

The Tyler Top zone has the highest fluid pressures and is characterized by high temperatures and high fluid pressures. The Tyler Middle zone has intermediate temperatures and intermediate fluid pressures. The Tyler Bottom zone has the lowest temperatures and lowest fluid pressures. The Tyler Top zone is the most productive zone and is characterized by high temperatures and high fluid pressures.

**DISCUSSION AND INTERPRETATION**

There are three sources of fluid overpressure: 1) the generation of hydrocarbons, 2) the tectonic compression of the Tyler Formation, and 3) the geologic history of the Tyler Formation. The generation of hydrocarbons is the most important source of fluid overpressure in the Tyler Formation. The tectonic compression of the Tyler Formation is also an important source of fluid overpressure in the Tyler Formation. The geologic history of the Tyler Formation is the least important source of fluid overpressure in the Tyler Formation.

The pressure build-up method was used to determine the productive capacity, pressure, permeability, and/or extent of hydrocarbon reservoirs in the Tyler Formation. The pressure build-up method is based on the principle that the fluid pressure in a reservoir is equal to the sum of the fluid pressure at the boundary and the fluid pressure at the depth of the reservoir. The pressure build-up method is based on the principle that the fluid pressure in a reservoir is equal to the sum of the fluid pressure at the boundary and the fluid pressure at the depth of the reservoir. The pressure build-up method is based on the principle that the fluid pressure in a reservoir is equal to the sum of the fluid pressure at the boundary and the fluid pressure at the depth of the reservoir.

**CONCLUSIONS**

1. The Tyler Formation of eastern North Dakota contains several source rocks that have high hydrocarbon generation potentials.
2. Fluid overpressure is significant in the Tyler Formation and is characterized by high temperatures and high fluid pressures.
3. The Tyler Formation is divided into three zones: the Tyler Top zone, the Tyler Middle zone, and the Tyler Bottom zone.
4. The Tyler Top zone has the highest fluid pressures and is characterized by high temperatures and high fluid pressures.
5. The Tyler Middle zone has intermediate temperatures and intermediate fluid pressures.
6. The Tyler Bottom zone has the lowest temperatures and lowest fluid pressures.
7. The Tyler Top zone is the most productive zone and is characterized by high temperatures and high fluid pressures.

**REFERENCES**


