Deep Geothermal Resources: Estimated Temperatures on Top of the Duperow Formation

Dickinson 100K Sheet, North Dakota

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Geothermal energy is a renewable source capable of yielding an unlimited supply of energy at low cost. The Duperow Formation overlies the Williston Basin, which contains significant geothermal resources that can be used to power electric generating plants for domestic and commercial heating and cooling, power generation, and industrial processes. These resources are found primarily in North Dakota, where they are the most extensive geothermal system in the United States. The Duperow Formation contains sediments that were deposited in a lake or river setting, and they can be divided into two main parts: the upper part consists of clay and silt, and the lower part consists of sandstone and shale.

Enhanced (or engineered) geothermal systems (EGS) are a type of geothermal resource that involves the injection of fluids into a reservoir to increase its temperature and flow, making it suitable for power generation. The Duperow Formation has been identified as a potential reservoir for EGS technology, and drilling and testing have been done to determine the feasibility of using this resource. The map shows the estimated temperatures on top of the Duperow Formation, which can range from 120°C to 212°C, depending on the location.

The map was compiled using data from various sources, including the U.S. Geological Survey, the North Dakota Geological Survey, and other government agencies. The map uses a scale of 1:50,000 and was updated in 2009.