

Research on Water Demand of China Shale Gas Development and its Influence on Water Environment

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Abstract China has vigorously promoted the exploration and the development of shale gas in recent years. Great breakthrough has been made in shale gas sedimentary environment of the marine facies, transitional facies and lacustrine facies target layer, especially in the southern Sichuan Basin, Fuling in Chongqing, Erdos basin in North China. The first round of shale gas resources assessment by China Ministry of Land and Resources based on the current development practice shows that China has huge potential for shale gas resources, with the recoverable resources as large as USA. One of the key factors for the successfully developing shale gas is fracturing based on the shale gas development process in USA. Hydraulic fracturing, the main fracturing, requires large amount of water. Although the water can be recycled after water purification, water consumption in hydraulic fracturing is also very large. So, it should be paid close attention to reconcile the relationship of the shale gas development and the water protection in future in China. The investigation of shale gas production and water consumption in USA gained the water consumption per unit shale gas production. Taken a shale gas fracturing well in China for an example, the paper researched the relationship of resource potential, shale gas production to fracturing water consumption, and estimated the water consumption per unit shale gas production in China. The correlation analysis and the match analysis of the shale gas resources distribution with water resources distribution in China was carried out. It was divided into rich water resource area and poor water resource area in shale gas development. Then, it proposed the sustainable strategy to the shale gas development with water consumption and the water protection.

Keywords shale gas, water demand, fracturing, development, water environment