

ICS 75.01
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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 41519-2022

**Requirements for water resource protection during shale gas
development**

页岩气开发过程水资源保护要求

Issued on: April 15, 2022

Implemented on: November 1, 2022

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1. Structure and Drafting Rules of Standardization Documents" drafted. Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents. This document is proposed and managed by the National Natural Gas Standardization Technical Committee (SAC/TC244). This document is drafted by: China National Petroleum Corporation Southwest Oil and Gas Field Branch, China National Petroleum Corporation Chuanqing Drilling Engineering Co., Ltd., Co., Ltd., Sinopec Chongqing Fuling Shale Gas Exploration and Development Co., Ltd., Shaanxi Yanchang Petroleum (Group) Co., Ltd., Southwest Petroleum University. The main drafters of this document. Zhu Jin, Li Jing, Liu Chunyan, Wang Xingrui, Li Wei, Hu Jinyan, Chen Tianxin, Wang Long, Xiang Qigui, Dai Zhong, Huang Lingling, Xie Haitao, Xia Xubo, Fang Xiaojun, Li Hui, Liu Wenshi. Requirements for water resources protection during shale gas development

1 Scope

China's national requirements for protecting water resources during shale gas development. Hydraulic fracturing uses water in quantity - tens of thousands of cubic metres per well - and produces a flowback that carries the fracturing chemicals, the salts and metals dissolved from the formation, and often naturally occurring radioactive material. Both ends of that are the subject here. China's principal shale gas basins are in Sichuan and Chongqing, in terrain that is mountainous, densely populated and agricultural, where the water is already committed to other uses; and the flowback cannot simply be disposed of. The requirements accordingly address sourcing, so that fracturing does not compete with agriculture and drinking supply; containment and monitoring, so that neither the fracturing fluid nor the flowback reaches shallow aquifers or surface water; and treatment and reuse, which is what makes a multi-well pad viable where fresh water is limited.

This document specifies the requirements for water intake, water use, waste water disposal,

water pollution prevention and control, and monitoring in the process of shale gas development. This document is applicable to the protection of water resources in shale gas pre-drilling engineering, drilling (completion) engineering, fracturing engineering, gathering and transportation engineering and other processes.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document.

GB 3838 Environmental Quality Standard for Surface Water

GB 8978 Integrated Wastewater Discharge Standard

GB/T 14848 Groundwater Quality Standard

GB 18597 Hazardous Waste Storage Pollution Control Standard

GB 18599 General Industrial Solid Waste Storage and Landfill Pollution Control Standard

GB/T 31033 Technical Specification for Oil and Gas Drilling Well Control

GB 50013 Design Standard for Outdoor Water Supply

GB/T 50934 Technical Specification for Anti-seepage of Petrochemical Engineering HJ/T

91 Technical Specification for Surface Water and Sewage Monitoring

HJ164 Technical Specification for Groundwater Environmental Monitoring

HJ610 Environmental Impact Assessment Technical Guidelines Groundwater Environment

HJ819 General Principles of Technical Guidelines for Self-monitoring of Pollutants

HJ2025 Technical Specifications for Hazardous Waste Collection, Storage and Transportation

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 flowbackfluids Fracturing fluid that flows back to the surface after the hydraulic fracturing operation.

4 Requirements for water intake

4.1 Water intake for shale gas development should follow the principles of rational utilization, economical use, and effective protection, and conform to the comprehensive

planning of river basins or regions and special plans such as water resource protection plans, and comply with approved water allocation plans or agreements.

4.2 The water source can be selected from surface water, urban reclaimed water, water supply from water projects, and urban tap water.

4.3 When the construction unit directly draws surface water (water from rivers and lakes), it shall apply for a water drawing permit.

4.4 The type of water intake structures should be based on the water intake volume and water quality requirements, combined with the river bed topography and geology, river bed erosion and deposition, water depth and water level variation,