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Abstract: The second edition of Restoration of Contaminated Aquifers: Petroleum Hydrocarbons and Organic Compounds incorporates the latest advances in in situ and ex situ technologies for the remediation of petroleum-contaminated aquifers. The book discusses the potential of bioremediation, chemical oxidation, electrokinetics, and other emerging technologies for the restoration of contaminated groundwater systems. It also covers the assessment of aquifer contamination, the design of remediation systems, and the evaluation of remediation effectiveness.

Bioremediation of Petroleum Contaminated Aquifers

Bioremediation is a process that uses microorganisms to degrade or remove contaminants from the environment. In the context of petroleum-contaminated aquifers, bioremediation involves the use of indigenous or externally introduced microorganisms to biodegrade petroleum hydrocarbons and other contaminants present in the aquifer.

Assessment of Aquifer Contamination

Assessment of aquifer contamination is a critical step in the remediation process. It involves the characterization of the contamination, the estimation of the extent and distribution of the contaminant plume, and the evaluation of the potential risks to human health and the environment. This information is used to design appropriate remediation strategies and to monitor the effectiveness of the remediation efforts.

Design of Remediation Systems

The design of remediation systems for petroleum-contaminated aquifers involves the selection of appropriate technologies, the estimation of the remediation time frame, and the evaluation of the potential impacts on the environment. This requires a comprehensive understanding of the aquifer properties, the contaminant characteristics, and the environmental conditions.

Evaluation of Remediation Efficacy

The evaluation of remediation efficacy is crucial to ensure that the remediation objectives are met. This involves the measurement of key performance indicators, such as contaminant concentrations, groundwater quality, and the biodegradation rates of petroleum hydrocarbons. Continuous monitoring and evaluation of the remediation performance are necessary to make adjustments to the remediation strategies if needed.

This book presents an up-to-date overview of the latest advancements in the remediation of petroleum-contaminated aquifers, providing a comprehensive guide for professionals involved in this field.