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Unconventional Gas Storage Stability of Fuels Unconventional Oil and Gas Resources Handbook Low-Energy Processes for Unconventional Oil Recovery Reservoir Engineering Numerical Simulation in Hydraulic Fracturing: Multiphysics Theory and Applications Unconventional: Natural Gas Development from Marcellus Shale Unconventional Reservoir Geomechanics Deep Shale Oil and Gas Environmental Considerations Associated with Hydraulic Fracturing Operations Beyond the Fracking Wars Unconventional Oil and Gas Resources Lacustrine Shale Gas

Shale Oil and Shale Gas Resources

Unconventional Hydrocarbon Resources

Environmental and Health Issues in Unconventional Oil and Gas Development offers a series of authoritative perspectives from varied viewpoints on key issues relevant in the use of directional drilling and hydraulic fracturing, providing a timely presentation of requisite information on the implications of these technologies for those connected to unconventional oil and shale gas development. Utilizing expertise from a range of contributors in academia, non-governmental organizations, and the oil and gas industry, Environmental and Health Issues in Unconventional Oil and Gas Development is an essential resource for academics and professionals in the oil and gas,

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environmental, and health and safety industries as well as for policy makers. Offers a multi-disciplinary appreciation of the environmental and health issues related to unconventional oil and shale gas development Serves as a collective resource for academics and professionals in the oil and gas, environmental, health, and safety industries, as well as environmental scientists and policymakers Features a diverse and expert group of chapter authors from academia, non-governmental organizations, governmental agencies, and the oil and gas industry

Environmental Issues Concerning Hydraulic Fracturing

Fluid Phase Behavior for Conventional and Unconventional Oil and Gas Reservoirs delivers information on the role of PVT (pressure-volume-temperature) tests/data in various aspects, in particular reserve estimation, reservoir modeling, flow assurance, and enhanced oil recovery for both conventional and unconventional reservoirs. This must-have reference also prepares engineers on the importance of PVT tests, how to evaluate the data, develop an effective management plan for flow assurance, and gain perspective of flow characterization, with a particular focus on shale oil, shale gas, gas hydrates, and tight oil making. This book is a critical resource for today's reservoir engineer, helping them effectively manage and maximize a company's oil and gas reservoir assets. Provides tactics on reservoir phase behavior and

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dynamics with new information on shale oil and gas hydrates Helps readers Improve on the effect of salt concentration and application to CO₂-Acid Gas Disposal with content on water-hydrocarbon systems Provides practical experience with PVT and tuning of EOS with additional online excel spreadsheet examples

The Fossil Fuel Revolution

"An excellent objective explanation of the history, science, technology, politics, environmental concerns, and economics of the shale gas boom. The author clearly has great practical experience of the science and technology of shale gas development and shows a deep understanding of the environmental and economic issues." --Andrew Stone, Executive Director, American Ground Water Trust New technology has opened vast reserves of "unconventional" natural gas and oil from shales like the Marcellus in the Appalachian Basin, making the United States essentially energy independent for the first time in decades. Shale gas had its origins in the oil embargos and energy crises of the 1970s, which led to government research to increase domestic energy supplies. The first large-scale shale gas production was successful on the Barnett Shale in Texas in the late 1990s, followed a few years later by the Marcellus Shale in Pennsylvania. Shale gas has changed thinking about fossil energy supplies worldwide, but the development of these resources has been controversial. Activists have made claims that hydraulic fracturing may contribute to climate

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change, threaten groundwater resources, and pose risks to terrestrial and aquatic ecosystems, and human health. This volume explores the geology, history, technology, and potential environmental impacts of Marcellus Shale gas resources.

Fundamentals of Gas Shale Reservoirs

Well Production Performance Analysis for Shale Gas Reservoirs is urgently needed by the petroleum community for unconventional oil and gas resources development and production. Features an in-depth analysis of shale gas horizontal fractured wells and how they differ from their conventional counterparts Includes detailed information about the testing of fractured horizontal wells before and after fracturing Offers in-depth analysis of numerical simulation and the importance of this tool for the development of shale gas reservoirs

Carbon Dioxide Capture and Storage

Over the last decade, the oil and gas industry has garnered a lot of support from the United States federal and state governments in the name of energy independence and economic prosperity. More specifically, hydraulic fracturing or fracking is said to not only make the production of affordable energy possible but also reduce emissions of carbon dioxide by substituting coal with natural gas in the utility sector. Behind the façade of many socio-economic and political benefits, the process of fracking causes serious environmental concerns. Dismissing the

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negative externalities of fracking simply raises the question, to what extent have communities close to fracking sites been adversely impacted by it? In this book, Sarmistha R. Majumdar studies four communities close to fracking well sites in Texas to help illustrate to what extent fracking regulations have been developed in Texas and how effective these regulations have been in safeguarding the interests of individuals in local communities amidst the lure of economic gains from the extraction of oil and natural gas from shale formations. Majumdar has developed a model to show stage by stage community actions to regain their quality of life and the consequences of their actions, if any, on state and local regulations and ordinances, and the oil and gas industry. This book will be an important resource for scholars of environmental and natural resource politics and policy in the United States.

Oil and Gas Production Handbook: An Introduction to Oil and Gas Production

Beyond the Fracking Wars provides an accessible and credible reference for lawyers, public officials, planners, and citizens. It avoids a "pro" or "anti" position and serves as a balanced resource on common issues associated with unconventional oil and gas exploration and development. Whether you are a state and local government lawyer, land owner, public official, planner, oil and gas industry employee, or interested citizen, Beyond the Fracking Wars is a must-have reference for understanding the controversial subject of unconventional oil and gas

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development and its impact on local governments.

Recent Insights in Petroleum Science and Engineering

A comprehensive textbook presenting techniques for the analysis and characterization of shale plays. Significant reserves of hydrocarbons cannot be extracted using conventional methods. Improvements in techniques such as horizontal drilling and hydraulic fracturing have increased access to unconventional hydrocarbon resources, ushering in the “shale boom” and disrupting the energy sector. Unconventional Hydrocarbon Resources: Techniques for Reservoir Engineering Analysis covers the geochemistry, petrophysics, geomechanics, and economics of unconventional shale oil plays. The text uses a step-by-step approach to demonstrate industry-standard workflows for calculating resource volume and optimizing the extraction process. Volume highlights include: Methods for rock and fluid characterization of unconventional shale plays A workflow for analyzing wells with stimulated reservoir volume regions An unconventional approach to understanding of fluid flow through porous media A comprehensive summary of discoveries of massive shale resources worldwide Data from Eagle Ford, Woodford, Wolfcamp, and The Bakken shale plays Examples, homework assignments, projects, and access to supplementary online resources Hands-on teaching materials for use in petroleum engineering software applications The American Geophysical Union promotes discovery in Earth and space science for the

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benefit of humanity. Its publications disseminate scientific knowledge and provide resources for researchers, students, and professionals.

Hydraulic Fracturing in Unconventional Reservoirs

Geophysics for Petroleum Engineers focuses on the applications of geophysics in addressing petroleum engineering problems. It explores the complementary features of geophysical techniques in better understanding, characterizing, producing and monitoring reservoirs. This book introduces engineers to geophysical methods so that they can communicate with geophysicist colleagues and appreciate the benefits of their work. These chapters describe fundamentals of geophysical techniques, their physical bases, their applications and limitations, as well as possible pitfalls in their misuse. Case study examples illustrate the integration of geophysical data with various other data types for predicting and describing reservoir rocks and fluid properties. The examples come from all over the world, with several case histories from the fields in the Middle East. Introduces geophysical methods to engineers Helps understanding, characterizing, producing and monitoring of geophysical techniques Updates the changing needs of reservoir engineering

Shale Gas

This book presents new insights into the development of different aspects of petroleum science and

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engineering. The book contains 19 chapters divided into two main sections: (i) Exploration and Production and (ii) Environmental Solutions. There are 11 chapters in the first section, and the focus is on the topics related to exploration and production of oil and gas, such as characterization of petroleum source rocks, drilling technology, characterization of reservoir fluids, and enhanced oil recovery. In the second section, the special emphasis is on waste technologies and environmental cleanup in the downstream sector. The book written by numerous prominent scholars clearly shows the necessity of the multidisciplinary approach to sustainable development in the petroleum industry and stresses the most updated topics such as EOR and environmental cleanup of fossil fuel wastes.

Oil, Gas, and Mining

Fundamentals of Enhanced Oil and Gas Recovery from Conventional and Unconventional Reservoirs delivers the proper foundation on all types of currently utilized and upcoming enhanced oil recovery, including methods used in emerging unconventional reservoirs. Going beyond traditional secondary methods, this reference includes advanced water-based EOR methods which are becoming more popular due to CO₂ injection methods used in EOR and methods specific to target shale oil and gas activity. Rounding out with a chapter devoted to optimizing the application and economy of EOR methods, the book brings reservoir and petroleum engineers up-to-speed on the latest studies to apply.

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Enhanced oil recovery continues to grow in technology, and with ongoing unconventional reservoir activity underway, enhanced oil recovery methods of many kinds will continue to gain in studies and scientific advancements. Reservoir engineers currently have multiple outlets to gain knowledge and are in need of one product go-to reference. Explains enhanced oil recovery methods, focusing specifically on those used for unconventional reservoirs Includes real-world case studies and examples to further illustrate points Creates a practical and theoretical foundation with multiple contributors from various backgrounds Includes a full range of the latest and future methods for enhanced oil recovery, including chemical, waterflooding, CO2 injection and thermal

Well Production Performance Analysis for Shale Gas Reservoirs

Oil, Gas, and Mining: A Sourcebook for Understanding the Extractive Industries provides developing countries with a technical understanding and practical options around oil, gas, and mining sector development issues. A central premise of the Sourcebook is that good technical knowledge can better inform political, economic, and social choices with respect to sector development and the related risks and opportunities. The guidance provided by the Sourcebook assumes a broad set of overarching principles, all centered on good governance and directed at achieving positive and broadly based sustainable development outcomes. This Sourcebook is rich in presenting options to challenges, on the

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understanding that contexts and needs vary, and that there is much to be gained from appreciating the lessons learned from a broad set of experiences.

Fundamentals of Enhanced Oil Recovery Methods for Unconventional Oil Reservoirs

Fundamentals of Enhanced Oil Recovery Methods for Unconventional Oil Reservoirs, Volume 67 provides important guidance on which EOR methods work in shale and tight oil reservoirs. This book helps readers learn the main fluid and rock properties of shale and tight reservoirs—which are the main target for EOR techniques—and understand the physical and chemical mechanisms for the injected EOR fluids to enhance oil recovery in shale and tight oil reservoirs. The book explains the effects of complex hydraulic fractures and natural fractures on the performance of each EOR technique. The book describes the parameters affecting obtained oil recovery by injecting different EOR methods in both the microscopic and macroscopic levels of ULR. This book also provides proxy models to associate the functionality of the improved oil recovery by injecting different EOR methods with different operating parameters, rock, and fluid properties. The book provides professionals working in the petroleum industry the know-how to conduct a successful project for different EOR methods in shale plays, while it also helps academics and students in understanding the basics and principles that make the performance of EOR methods so different in conventional reservoirs

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and unconventional formations. Provides a general workflow for how to conduct a successful project for different EOR methods in these shale plays Provides general guidelines for how to select the best EOR method according to the reservoir characteristics and wells stimulation criteria Explains the basics and principles that make the performance of EOR methods so different in conventional reservoirs versus unconventional formations

Unconventional Resources in India: The Way Ahead

This book addresses the need for deeper understanding of regulatory and policy regimes around the world in relation to the use of water for the production of 'unconventional' hydrocarbons, including shale gas, coal bed methane and tight oil, through hydraulic fracturing. Legal, policy, political and regulatory issues surrounding the use of water for hydraulic fracturing are present at every stage of operations. Operators and regulators must understand the legal, political and hydrological contexts of their surroundings, procure water for use in the fracturing and extraction processes, gain community cooperation or confront social resistance around water, collect flow back and produced water, and dispose of these wastewaters safely. By analysing and comparing different approaches to these issues from around the globe, this volume gleans insights into how policy, best practices and regulation may be developed to advance the interests of all stakeholders. While it is not always possible to easily

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transfer 'good practice' from one place to another, there is value in examining and understanding the components of different legal and regulatory regimes, as these may assist in the development of better regulatory law and policy for the rapidly growing unconventional energy sector. The book takes an interdisciplinary approach and includes chapters looking at water-energy nexus security in general, along with issue-focused and geographically-focused case studies written by scholars from around the world. Chapter topics, organized in conjunction with the stage of the shale gas production process upon which they touch, include the implications of hydraulic fracturing for agriculture, municipalities, and other stakeholders competing for water supplies; public opinion regarding use of water for hydraulic fracturing; potential conflicts between hydraulic fracturing and water as a human right; prevention of induced seismic activity, and the disposal or recycling of produced water. Several chapters also discuss implications of unconventional energy production for indigenous communities, particularly as regards sustainable water management. This volume will be of interest to scholars and students of energy and water, regulators and policymakers and operators interested in ensuring that they align with emergent best global practice.

Fundamentals of Enhanced Oil and Gas Recovery from Conventional and Unconventional Reservoirs

Environmental Issues Concerning Hydraulic

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Fracturing, Volume One captures the state-of-the-art research currently used to evaluate the potential impact of unconventional gas and oil gas extraction processes. Topics in this comprehensive guide on the topic include chapters on The Human Health Implications of Unconventional Oil and Gas Development, The use of Noble Gas Analysis and other Forensic Techniques in Characterizing Contamination Pathways Associated with Oil and Gas Development, Well Integrity, Contamination Mechanisms and Groundwater Impacts Associated with Unconventional Oil and Gas Development, and Advances in Fracturing and Well Construction: Improving Efficiency and Reducing Risks. This serial explores a wide breadth of emerging and state-of-the-art technologies used to study the potential environmental impact and various processes in the massive industrial process of shale exploration and resource extraction. Covers a wide breadth of emerging and state-of-the-art technologies Includes contributions from an International board of authors Provides a comprehensive set of reviews, covering the potential impact of unconventional gas and oil gas extraction processes

Reservoir Engineering of Conventional and Unconventional Petroleum Resources

Reservoir Engineering of Conventional and Unconventional Petroleum Resources is a practical guide and handbook for engineers and geoscientists. It is also a complete textbook for teaching of reservoir

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engineering courses with exercises in each chapter. The sources and applications of basic rock properties are presented. Prediction of PVT properties from correlations and equations of state, and laboratory measurements of same properties from fluid samples are discussed. These basic data are applied in material balance analyses, volumetric calculation of hydrocarbons-in-place and reserves, and analyses of reservoir performance using case histories. Production forecasts for conventional and unconventional reservoirs using Arps' decline equations in decline curve analyses (DCA) are presented. The applications of modified Arps' decline equations coupled with transient flow models in rate transient analyses (RTA) are illustrated. Dr. Ezekwe presents fundamental equations and methods for pressure transient analysis (PTA) for fractured and unfractured wells in conventional reservoirs. This is accompanied with well test analyses in unconventional reservoirs using diagnostic fracture injection tests (DFIT). Secondary recovery methods focused on waterflooding, gasflooding, and low salinity waterflooding are demonstrated. Enhanced oil recovery methods are discussed. Dr. Ezekwe recommends experience-based practical procedures for geologic modeling, reservoir characterization, reservoir simulation, and reservoir management. Fundamental economic decision criteria including profitability index, net present value, rate of return are demonstrated with examples. Reservoir Engineering of Conventional and Unconventional Petroleum Resources equips engineers with knowledge and skills on how to: Acquire basic rock and fluid properties Predict PVT properties for oil and

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gas reservoirs from correlations and equations of state Perform reserves evaluations for conventional & unconventional reservoirs using DCA methods Perform PTA and DFIT analyses for wells in conventional and unconventional reservoirs Conduct rate transient analyses (RTA) for unconventional reservoirs Implement waterflooding, gasflooding, and low salinity waterflooding projects Screen reservoirs for EOR processes and install field-wide EOR projects Build geologic models, reservoir models, and conduct reservoir simulation Develop and implement reservoir management strategies Perform economic evaluation of petroleum projects and resources. Build economic models of projects, fields, and resources

Offshore Well Completion and Stimulation

Natural gas, particularly shale gas, is one of the main sustainable energy sources in the current century. It is an abundant energy resource, playing an active role in future energy demand and enabling nations to transition to higher support on renewable energy sources. The book aims to add some contributions and new advances in technologies and prospects on shale gas reserves in selected regions of the world, in terms of new technologies of extraction, new discoveries of promising reserves, synthesis and applications to get high quality of this cleanest consuming non-renewable energy source.

Fluid Phase Behavior for Conventional and Unconventional Oil and Gas

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Reservoirs

Natural gas and crude oil production from hydrocarbon rich deep shale formations is one of the most quickly expanding trends in domestic oil and gas exploration. Vast new natural gas and oil resources are being discovered every year across North America and one of those new resources comes from the development of deep shale formations, typically located many thousands of feet below the surface of the Earth in tight, low permeability formations. Deep Shale Oil and Gas provides an introduction to shale gas resources as well as offer a basic understanding of the geomechanical properties of shale, the need for hydraulic fracturing, and an indication of shale gas processing. The book also examines the issues regarding the nature of shale gas development, the potential environmental impacts, and the ability of the current regulatory structure to deal with these issues. Deep Shale Oil and Gas delivers a useful reference that today's petroleum and natural gas engineer can use to make informed decisions about meeting and managing the challenges they may face in the development of these resources. Clarifies all the basic information needed to quickly understand today's deeper shale oil and gas industry, horizontal drilling, fracture fluids chemicals needed, and completions Addresses critical coverage on water treatment in shale, and important and evolving technology Practical handbook with real-world case shale plays discussed, especially the up-and-coming deeper areas of shale development

Exploitation of Unconventional Oil and Gas Resources

Shale Gas Production Processes

The Fossil Fuel Revolution: Shale Gas and Tight Oil describes the remarkable new energy resources being obtained from shale gas and tight oil through a combination of directional drilling and staged hydraulic fracturing, opening up substantial new energy reserves for the 21st Century. The book includes the history of shale gas development, the technology used to economically recover hydrocarbons, and descriptions of the ten primary shale gas resources of the United States. International shale resources, environmental concerns, and policy issues are also addressed. This book is intended as a reference on shale gas and tight oil for industry members, undergraduate and graduate students, engineers and geoscientists. Provides a cross-cutting view of shale gas and tight oil in the context of geology, petroleum engineering, and the practical aspects of production Includes a comprehensive description of productive and prospective shales in one book, allowing readers to compare and contrast production from different shale plays Addresses environmental and policy issues and compares alternative energy resources in terms of economics and sustainability Features an extensive resource list of peer-reviewed references, websites, and journals provided at the end of each chapter

Advances in Natural Gas Emerging Technologies

Unconventional Oil and Gas Resources Handbook: Evaluation and Development is a must-have, helpful handbook that brings a wealth of information to engineers and geoscientists. Bridging between subsurface and production, the handbook provides engineers and geoscientists with effective methodology to better define resources and reservoirs. Better reservoir knowledge and innovative technologies are making unconventional resources economically possible, and multidisciplinary approaches in evaluating these resources are critical to successful development. Unconventional Oil and Gas Resources Handbook takes this approach, covering a wide range of topics for developing these resources including exploration, evaluation, drilling, completion, and production. Topics include theory, methodology, and case histories and will help to improve the understanding, integrated evaluation, and effective development of unconventional resources. Presents methods for a full development cycle of unconventional resources, from exploration through production Explores multidisciplinary integrations for evaluation and development of unconventional resources and covers a broad range of reservoir characterization methods and development scenarios Delivers balanced information with multiple contributors from both academia and industry Provides case histories involving geological analysis, geomechanical analysis, reservoir modeling, hydraulic fracturing treatment, microseismic monitoring, well

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performance and refracturing for development of unconventional reservoirs

Regulating Water Security in Unconventional Oil and Gas

Reservoir Engineering focuses on the fundamental concepts related to the development of conventional and unconventional reservoirs and how these concepts are applied in the oil and gas industry to meet both economic and technical challenges. Written in easy to understand language, the book provides valuable information regarding present-day tools, techniques, and technologies and explains best practices on reservoir management and recovery approaches. Various reservoir workflow diagrams presented in the book provide a clear direction to meet the challenges of the profession. As most reservoir engineering decisions are based on reservoir simulation, a chapter is devoted to introduce the topic in lucid fashion. The addition of practical field case studies make Reservoir Engineering a valuable resource for reservoir engineers and other professionals in helping them implement a comprehensive plan to produce oil and gas based on reservoir modeling and economic analysis, execute a development plan, conduct reservoir surveillance on a continuous basis, evaluate reservoir performance, and apply corrective actions as necessary. Connects key reservoir fundamentals to modern engineering applications Bridges the conventional methods to the unconventional, showing the differences between the two processes Offers field case studies and workflow

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diagrams to help the reservoir professional and student develop and sharpen management skills for both conventional and unconventional reservoirs

The Politics of Fracking

Natural gas has become the world's primary supply of energy in the last decades. It is naturally occurring from the decomposition of organic materials, over the past 150 million years ago, into hydrocarbons. It is considered one of the most useful energy sources and the fastest growing energy source in the world. This book presents state-of-the-art advances in natural gas emerging technologies. It contains ten chapters divided into three sections that cover natural gas technology, utilization, and alternative.

Unconventional Petroleum Geology

A comprehensive overview of the key geologic, geomechanical and engineering principles that govern the development of unconventional oil and gas reservoirs. Covering hydrocarbon-bearing formations, horizontal drilling, reservoir seismology and environmental impacts, this is an invaluable resource for geologists, geophysicists and reservoir engineers.

Enhanced Oil Recovery in Shale and Tight Reservoirs

This book addresses unconventional hydrocarbon resources in India and the prospects for their

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exploitation. Each chapter focuses on a particular unconventional resource, including gas hydrates, coal bed methane and shale, while the book as a whole takes into account the government's projections concerning these resources. The book provides readers with essential information on the nation's energy requirements, methods of exploiting its available unconventional resources, and their contribution to meeting India's energy requirements. It also addresses the various geological conditions that are necessary for the exploration of these resources, and enables readers to understand the challenges that need to be overcome. Its logical, clearly structured chapters make the book an ideal starting point for readers interested in unconventional energy resources. It will especially benefit undergraduate and graduate students in the field of Energy Engineering, as well as academic researchers and industry professionals seeking an overview of the status quo of unconventional hydrocarbon resources in India.

Geophysics for Petroleum Engineers

While the public is generally aware of the use of hydraulic fracturing for unconventional resource development onshore, it is less familiar with the well completion and stimulation technologies used in offshore operations, including hydraulic fracturing, gravel packs, "fracpacks," and acid stimulation. Just as onshore technologies have improved, these well completion and stimulation technologies for offshore hydrocarbon resource development have progressed

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over many decades. To increase public understanding of these technologies, the National Academies of Sciences, Engineering, and Medicine established a planning committee to organize and convene a workshop on Offshore Well Completion and Stimulation: Using Hydraulic Fracturing and Other Technologies on October 2-3, 2017, in Washington, DC. This workshop examined the unique features about operating in the U.S. offshore environment, including well completion and stimulation technologies, environmental considerations and concerns, and health and safety management. Participants from across government, industry, academia, and nonprofit sectors shared their perspectives on operational and regulatory approaches to mitigating risks to the environment and to humans in the development of offshore resources. This publication summarizes the presentations and discussions from the workshop.

Environmental and Health Issues in Unconventional Oil and Gas Development

Unconventional Petroleum Geology is the first book of its kind to collectively identify, catalog, and assess the exploration and recovery potential of the Earth's unconventional hydrocarbons. Advances in hydrocarbon technology and petroleum development systems have recently made the exploration of unconventional hydrocarbons—such as shale gas, tight sandstone oil and gas, heavy oil, tar sand, and coalbed methane—the hottest trend in the petroleum industry. Detailed case studies act as real-world

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application templates, making the book's concepts immediately practical and useful by exploration geologists. The logical and intuitive three-part approach of systematically identifying an unconventional hydrocarbon, cataloguing its accumulation features, and assessing its exploration and recovery potential can be immediately implemented in the field—anywhere in the world. Provides a detailed assessment of the exploration and recovery potential of the full range of unconventional hydrocarbons More than 300 illustrations—many in full color—capture the detailed intricacies and associated technological advances in unconventional hydrocarbon exploration More than 20 case studies and examples from around the world conclude each chapter and aid in the application of key exploration and recovery techniques

Risks, Rewards and Regulation of Unconventional Gas

IPCC Report on sources, capture, transport, and storage of CO₂, for researchers, policy-makers and engineers.

Storage Stability of Fuels

As the shale revolution continues in North America, unconventional resource markets are emerging on every continent. In the next eight to ten years, more than 100,000 wells and one- to two-million hydraulic fracturing stages could be executed, resulting in close to one trillion dollars in industry spending. This growth

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has prompted professionals experienced in conventional oil and gas exploitation and development to acquire practical knowledge of the unconventional realm. Unconventional Oil and Gas Resources: Exploitation and Development provides a comprehensive understanding of the latest advances in the exploitation and development of unconventional resources. With an emphasis on shale, this book: Addresses all aspects of the exploitation and development process, from data mining and accounting to drilling, completion, stimulation, production, and environmental issues Offers in-depth coverage of sub-surface measurements (geological, geophysical, petrophysical, geochemical, and geomechanical) and their interpretation Discusses the use of microseismic, fiber optic, and tracer reservoir monitoring technologies and JewelSuite™ reservoir modeling software Presents the viewpoints of internationally respected experts and researchers from leading exploration and production (E&P) companies and academic institutions Explores future trends in reservoir technologies for unconventional resources development Unconventional Oil and Gas Resources: Exploitation and Development aids geologists, geophysicists, petrophysicists, geomechanic specialists, and drilling, completion, stimulation, production, and reservoir engineers in the environmentally safe exploitation and development of unconventional resources like shale.

Unconventional Oil and Gas Resources Handbook

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The expansion of unconventional petroleum resources in the recent decade and the rapid development of computational technology have provided the opportunity to develop and apply 3D numerical modeling technology to simulate the hydraulic fracturing of shale and tight sand formations. This book presents 3D numerical modeling technologies for hydraulic fracturing developed in recent years, and introduces solutions to various 3D geomechanical problems related to hydraulic fracturing. In the solution processes of the case studies included in the book, fully coupled multi-physics modeling has been adopted, along with innovative computational techniques, such as submodeling. In practice, hydraulic fracturing is an essential project component in shale gas/oil development and tight sand oil, and provides an essential measure in the process of drilling cuttings reinjection (CRI). It is also an essential measure for widened mud weight window (MWW) when drilling through naturally fractured formations; the process of hydraulic plugging is a typical application of hydraulic fracturing. 3D modeling and numerical analysis of hydraulic fracturing is essential for the successful development of tight oil/gas formations: it provides accurate solutions for optimized stage intervals in a multistage fracking job. It also provides optimized well-spacing for the design of zipper-frac wells. Numerical estimation of casing integrity under stimulation injection in the hydraulic fracturing process is one of major concerns in the successful development of unconventional resources. This topic is also investigated numerically in this book. Numerical solutions to several other typical geomechanics problems related to hydraulic

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fracturing, such as fluid migration caused by fault reactivation and seismic activities, are also presented. This book can be used as a reference textbook to petroleum, geotechnical and geothermal engineers, to senior undergraduate, graduate and postgraduate students, and to geologists, hydrogeologists, geophysicists and applied mathematicians working in this field. This book is also a synthetic compendium of both the fundamentals and some of the most advanced aspects of hydraulic fracturing technology.

Low-Energy Processes for Unconventional Oil Recovery

A guide to environmental and communication issues related to fracking and the best approach to protect communities Environmental Considerations Associated with Hydraulic Fracturing Operations offers a much-needed resource that explores the complex challenges of fracking by providing an understanding of the environmental and communication issues that are inherent with hydraulic fracturing. The book balances the current scientific knowledge with the uncertainty and risks associated with hydraulic fracking. In addition, the authors offer targeted approaches for helping to keep communities safe. The authors include an overview of the historical development of hydraulic fracturing and the technology currently employed. The book also explores the risk, prevention, and mitigation factors that are associated with fracturing. The authors also include legal cases, regulatory issues, and data on the cost of recovery. The volume presents audit checklists

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for gathering critical information and documentation to support the reliability of the current environmental conditions related to fracking operations and the impact fracking can have on a community. This vital resource: Contains the technical information and mitigation recommendations for safety and environmental issues related to hydraulic fracturing Offers an historical overview of conventional and unconventional oil and gas drilling Explains the geologic and technical issues associated with fracking of tight sand and shale formulations Presents numerous case studies from the United States EPA and other agencies Discusses issues of co-produced waste water and induced seismicity from the injection of wastewater Written for environmental scientists, geologists, engineers, regulators, city planners, attorneys, foresters, wildlife biologists, and others, Environmental Considerations Associated with Hydraulic Fracturing Operations offers a comprehensive resource to the complex environmental and communication issues related to fracking.

Reservoir Engineering

Lacustrine Shale Gas: Case Study from the Ordos Basin examines the special sedimentation and formation environment based on the actual exploration of lacustrine shale gas. Using the Chang7 black shale of Yanchang formation in Ordos basin as an example, this book deeply dissects the Lacustrine shale geological characteristics and offers fresh insights into Lacustrine shale geochemistry, shale

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reservoir, hydrocarbon accumulation and resource evaluation. The book not only enriches, develops and contributes to new theories of shale gas exploration, but also contributes to a new research field, lacustrine shale gas exploration. Shale gas is the mixed phase natural gas that includes adsorbed phase and free phase gas. It is accumulated in the rich organic matter in shale. In recent years, with great changes in global oil and gas exploration and energy supply situation, shale gas has attracted a lot of attention, becoming the focus of the energy industry. Reflects the development of world-leading shale gas exploration technology in China Analyzes first-hand experimental data and scientific research methods on the geological characteristics of lacustrine shale gas Systematically discusses the theory of lacustrine shale gas exploration, from source rock characteristics, shale reservoir characteristics, and shale gas accumulation, to shale gas resources evaluation Provides practical guidance by using the Ordos basin as example

Numerical Simulation in Hydraulic Fracturing: Multiphysics Theory and Applications

Hydraulic Fracturing in Unconventional Reservoirs: Theories, Operations, and Economic Analysis, Second Edition, presents the latest operations and applications in all facets of fracturing. Enhanced to include today's newest technologies, such as machine learning and the monitoring of field performance using pressure and rate transient analysis, this

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reference gives engineers the full spectrum of information needed to run unconventional field developments. Covering key aspects, including fracture clean-up, expanded material on refracturing, and a discussion on economic analysis in unconventional reservoirs, this book keeps today's petroleum engineers updated on the critical aspects of unconventional activity. Helps readers understand drilling and production technology and operations in shale gas through real-field examples Covers various topics on fractured wells and the exploitation of unconventional hydrocarbons in one complete reference Presents the latest operations and applications in all facets of fracturing

Unconventional: Natural Gas Developmt from Marcellus Shale

This multidisciplinary book covers a wide range of topics addressing critical challenges for advancing the understanding and management of shale oil and shale gas resources. Both fundamental and practical issues are considered. By covering a variety of technical topics, we aim to contribute to building a more integrated perspective to meet major challenges faced by shale resources. Combining complementary techniques and examining multiple sources of data serve to advance our current knowledge about these unconventional reservoirs. The book is a result of interdisciplinary and collaborative work. The content includes contributions authored by active scientists with ample expertise in their fields. Each article was carefully peer-reviewed

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by researchers, and the editorial process was performed by an experienced team of Senior Editors, Guest Editors, Topic Editors, and Editorial Board Members. The first part is devoted to fundamental topics, mostly investigated on the laboratory scale. The second part elaborates on larger scales (at near-wellbore and field scales). Finally, two related technologies, which could be relevant for shale plays applications, are presented. With this Special Issue, we provide a channel for sharing information and lessons learned collected from different plays and from different disciplines.

Unconventional Reservoir Geomechanics

Provides comprehensive information about the key exploration, development and optimization concepts required for gas shale reservoirs Includes statistics about gas shale resources and countries that have shale gas potential Addresses the challenges that oil and gas industries may confront for gas shale reservoir exploration and development Introduces petrophysical analysis, rock physics, geomechanics and passive seismic methods for gas shale plays Details shale gas environmental issues and challenges, economic consideration for gas shale reservoirs Includes case studies of major producing gas shale formations

Deep Shale Oil and Gas

Environmental Considerations

Associated with Hydraulic Fracturing Operations

This book explains the drivers and implications of unconventional gas at regional, national and global scales with case studies and in-depth analyses.

Beyond the Fracking Wars

This book presents an analysis of the results of studies of motor fuels ageing, conducted in laboratory and model conditions, in terms of building a system operating on-line, allowing continuous assessment of the operational usability of gasoline and diesel fuels, including those containing the addition of ethanol and FAME, respectively. This research was carried out in the framework of the project: "A system for the continuous control of the degree and rate of the liquid fuels ageing process during storage, which received co-funding from the European Regional Development Fund under the Operational Programme "Innovative Economy". The book presents an evaluation of the impact of fuel production processes on its stability and an analysis of changes in normative parameters of fuels during their storage and use. The book presents also the results of tests on the corrosive effects of fuels during storage processes. This project was co-financed by the European Regional Development Fund under the Operational Programme "Innovative Economy".

Unconventional Oil and Gas Resources

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The extraction of natural gas from shale formations is no simple task and perhaps the most expensive when compared to over unconventional gases. Although, its popularity has grown over the years, there is much to be done to make their production and processing more cost-effective. Brief but comprehensive, *Shale Gas Production Processes* begins with an overview of the chemistry, engineering and technology of shale gas. This is quickly followed by self-contained chapters concerning new and evolving process technologies and their applications as well as environmental regulations. Written in an easy to read format, *Shale Gas Production Processes* will prove useful for those scientists and engineers already engaged in fossil fuel science and technology as well as scientists, non-scientists, engineers, and non-engineers who wish to gain a general overview or update of the science and technology of shale gas. In addition, the book discusses methods used to reduce environmental footprint and improve well performance. Updates on the evolving processes and new processes Provides overview of the chemistry, engineering, and technology of shale gas Guides the reader through the latest environmental regulation regarding production and processing of shale

Lacustrine Shale Gas

Oil Recovery in Shale and Tight Reservoirs delivers a current, state-of-the-art resource for engineers trying to manage unconventional hydrocarbon resources. Going beyond the traditional EOR methods, this book helps readers solve key challenges on the proper

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methods, technologies and options available.

Engineers and researchers will find a systematic list of methods and applications, including gas and water injection, methods to improve liquid recovery, as well as spontaneous and forced imbibition. Rounding out with additional methods, such as air foam drive and energized fluids, this book gives engineers the knowledge they need to tackle the most complex oil and gas assets. Helps readers understand the methods and mechanisms for enhanced oil recovery technology, specifically for shale and tight oil reservoirs Includes available EOR methods, along with recent practical case studies that cover topics like fracturing fluid flow back Teaches additional methods, such as soaking after fracturing, thermal recovery and microbial EOR

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