Society of Petroleum Engineers

Eastern Regional Meeting 2006

"Revitalizing Appalachia"

October 11-13, 2006 Canton, Ohio, USA

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 www.proceedings.com

ISBN: 978-1-60423-649-1



Copyright 2006, Society of Petroleum Engineers

Material included in this *Proceedings* is copyright protected. Electronic reproduction, distribution, or storage of any part of an SPE-copyrighted paper for commercial purposes without the written consent of the Society of Petroleum Engineers is prohibited. Permission to reproduce in print is restricted to an abstract of not more than 300 words; illustrations may not be copied. The abstract must contain conspicuous acknowledgment of where and by whom the paper was presented. For photocopying beyond the above permissions, libraries and other users dealing with the Copyright Clearance Center (CCC) Transactional Reporting Service must pay a base fee of \$3 per copyrighted article plus \$0.25 per page to CCC, 222 Rosewood Drive, Danvers, Massachusetts 01923 U.S.A. For other permissions, contact Librarian, SPE, 222 Palisades Creek Drive, Richardson, Texas 75080-2040 U.S.A. Use of SPE member or author contact information included on this CD for commercial purposes or reproduction of that information in whole or in part, in any form or medium, is strictly prohibited and subject to legal action. Contact SPE to inquire about rental of mailing lists.

The CD of the 2006 SPE Eastern Regional Meeting was produced by SPE. This product contains Adobe® Reader® Software. Permission to print and distribute content from this product must be obtained from SPE. Duplication of replication products is absolutely prohibited without written permission from SPE and Adobe. Adobe, the Adobe logo, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. Material on the CD was reproduced from original papers and/or electronic files provided by the authors. Some discrepancies are inevitable. Please advise SPE of errors so corrections can be made to the electronic versions of the article. Send corrections by e-mail to pdf@spe.org or mail to the SPE Americas Office, attention Technical Paper Administrator.

Society of Petroleum Engineers

Eastern Regional Meeting 2006

Table of Contents

Committees

SPE 97070 Identifying the Timing and Sources of Damage in Gas Storage Wells Using Smart Storage Technology	1
J.P. Spivey, Phoenix Reservoir Engineering; K.G. Brown, and W.K. Sawyer, Schlumberger; and R.G. Gilmore Jr., Columbia Gas Transmission Corp.	1
SPE 98236 Sustaining Conductivity	11
SPE 104223 Lasers: The Next Bit	25
SPE 104226 Expandable and Contractable Bit	35
SPE 104280 Nanologging: Use of Nanorobots for Logging	38
SPE 104281 Microbe-Enhanced Oil Recovery Technology Obtains Huge Success in Low-Permeability Reservoirs in Daqing Oilfield	45
SPE 104290 Guidelines to Successful Dewatering of CBM Wells	53
SPE 104299 Pipeline Corrosion: Its Remote Detection and Corrosion Management	58
SPE 104306 Case Study: Optimizing Hydraulic Fracturing Performance in Northeastern United States Fractured Shale Formations	62
SPE 104307 KPIM of Gas/Condensate Productivity: Prediction of Condensate/Gas Ratio (CGR) Using Reservoir Volumetric Balance	73

SPE 104314 Economic Pumping Technology for Coalbed Methane (CBM), Stripper Oil, and Shallow Gas Well Deliquification80
Michael W. Dickey, SmithLift LLC
SPE 104319 Obtaining Permeability Values in a Coalbed Methane Core-Hole Utilizing Slimhole Technology Coupled With an Injection/Falloff Technique
SPE 104380 A Permeability Model for Coal and Other Fractured, Sorptive-Elastic Media89 Eric P. Robertson, Idaho Natl. Laboratory, and Richard L. Christiansen, Colorado School of Mines
SPE 104458 An Innovative Method: Risk Assessment for Exploration and Development of Oil and Gas
SPE 104472 Cased-Hole Formation Resistivity (CHFR) Technique Improves Hydrocarbon Saturation Monitoring in Developed Reservoirs
SPE 104479 Air Injection and Waterflood Performance Comparison of Two Adjacent Units in Buffalo Field: Economic Analysis
SPE 104491 Huff 'n' Puff Recovery Technique on Waterout Horizontal Wells
SPE 104520 Optimizing Horizontal-Well Steam-Stimulation Strategy for Heavy-Oil Development
SPE 104526 Revitalizing the Richard King Field: Using New Technology in a Cost-Effective Manner on Mature Fields
SPE 104535 Optimal Well-Testing Strategy for Production Optimization: A Monte Carlo Simulation Approach
SPE 104546 Granite Wash Field Study—Buffalo Wallow Field, Texas Panhandle
SPE 104547 New Methods and Equipment for Dewatering Unconventional Gas Resources Using Sucker-Rod Pumping Equipment
SPE 104550 Identifying Infill Locations and Underperformer Wells in Mature Fields Using Monthly Production Rate Data, Carthage Field, Cotton Valley Formation, Texas177 J. Jalali, S.D. Mohaghegh, and R. Gaskari, West Virginia U.

SPE 104551 Risk Analysis for Water Injection in a Petroleum Reservoir Considering Geomechanical Aspects
SPE 104554 Estimating Major and Minor Natural Fracture Pattern in Gas Shales Using Production Data
SPE 104555 Gas Storage in a Depleted Gas/Condensate Reservoir in the Appalachian Basin
SPE 104556 New Techniques for Plunger Lift in Conventional and Nonconventional Gas
SPE 104557 Multistage Fracturing System: Improving Operational Efficiency and Production
SPE 104563 Innovations in Drilling Using Replaceable Bits
SPE 104570 Using Induced Microseismicity To Monitor Hydraulic Fracture Treatment: A Tool To Improve Completion Techniques and Reservoir Management
SPE 104571 An Intelligent Portfolio-Management Approach to Gas Storage Field Deliverability Maintenance and Enhancement: Part One—Database Development and Model Building
SPE 104572 Successful Application of Relative-Permeability Modifiers To Control Water Production in Rose Run Fracturing
SPE 104574 Optimal Infill Drilling Design for Marginal Gas Reservoirs Using a Simulation-Based Inversion Approach
SPE 104576 Improving Cement Bond in the Appalachian Basin With Adjustments to Preflush and Spacer Design
SPE 104589 Slickwater Technology Helping Greene County Enhance Natural Gas Production

SPE 104594 Plunger Lift Optimization by Monitoring and Analyzing Wellbore	
Acoustic Signals and Tubing and Casing Pressures	283
Dieter Joseph Becker, O.L. Rowlan, and J.N. McCoy, Echometer Co., and A.L. Podio, U. of Texas at Austin	
SPE 104596 Identification and Analysis of Fields for Waterflood-Enhanced	
Recovery Efforts	299
Rod Hall, GrailQuest Corp.; Dwight Ross, Dwight Ross Drilling Co.; Greg Stevens, GrailQuest Corp.; and Steve Muehlberger, Island Oil & Gas	
SPE 104598 Optimizing Drilling Operations in the Arkoma Basin: Building on Success	303
Louis A. Romo, David R. Bert, and Cliff Richard, BP America; Luke Kuwertz, Schlumberger	
Drilling & Measurements; William L. Koederitz, Totco; and Kirk Card and Steve Barton, Reed Hycalog	