

# Curriculum Vita

## GEORGE J. MORIDIS

### ADDRESS

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Earth Sciences Division, Department of Hydrology and Reservoir Dynamics, MS 90-1116  
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### EDUCATION

#### *Graduate*

#### Jan. 1983 - 1987

Ph.D. in Reservoir Engineering  
Texas A&M University, College Station, Texas 77843

#### 1980 - Dec. 1982

M.Sc. in Agricultural Engineering  
Texas A&M University, College Station, Texas 77843

#### 1979-1980

M.E. in Chemical Engineering  
National Metsovion Technical University, Athens 10233, GREECE

#### *Undergraduate*

#### 1975-1979

B.Sc. (Honors) in Chemical Engineering  
National Metsovion Technical University, Athens 10233, GREECE

### EXPERIENCE

#### *Nov. 1991 to present*

**Deputy Program Lead for Energy Resources (Sept. 2009 to present)**  
**Research Area Leader, Transport and Thermodynamics (2003 to Sept. 2009)**  
**Group Leader, Contaminant Hydrology (1997 to 2003)**  
**Group Leader, Subsurface Containment Technologies (1993 to 1997)**  
**Staff Scientist**

*Lawrence Berkeley National Laboratory, University of California  
Earth Sciences Division, Hydrology and Reservoir Dynamics Department*

***Visiting Professor**, Petroleum Engineering Dept., Texas A&M University, College Station,  
Texas, USA (2006 to present)*

***Adjunct Professor**, Chemical Engineering Dept., Colorado School of Mines, Golden,  
Colorado, USA (2003 to present)*

***Visiting Professor**, Guangzhou Center for Gas Hydrate Research, Guangzhou Institute for  
Energy Conversion, Chinese Academy of Sciences, China (2009 to present)*

***Adjunct Professor**, Petroleum and Natural Gas Engineering Dept., Middle East Technical  
University, Ankara, Turkey (2005 to present)*

- PI of projects (a) evaluating the production potential of newly-discovered hydrate deposits in the Gulf of Mexico (funded by Statoil of Norway) and (b) in the Ulleung Basin in the Korean East Sea (funded by KIGAM of Korea), (c) assessing the geomechanical stability of marine hydrate deposits in New Zealand (funded by Science of New Zealand, and (d) analyzing the environmental impact of hydro-fracking for gas production from shales (funded by the US EPA).

- PI of a project evaluating the energy potential and system response (flow, thermal and geomechanical) of three geothermal systems (a low-temperature, a high-temperature, and enhanced geothermal system) in the Rio Grande Rift – project funded by the US Department of Energy, and involved students taking G. Moridis’s course on advanced simulation at Texas A&M University.
- Overall project leader and LBNL PI of the largest projects awarded by RPSEA on Unconventional Gas Resources in (a) 2008 (\$1.8M over 2 years), “**A Self-Teaching Expert System for the Analysis, Design and Prediction of Gas Production from Unconventional Gas Resources**”; a collaboration of LBNL (lead institution), Texas A&M University (Dr. Tom Blasingame, Petroleum Engineering Dept.) and the University of Houston (Dr. Michael Nikolaou, Chemical Engineering Dept.), and (b) 2009 (\$2.9M over 3 years), “**Coupled Flow-Geophysical-Geomechanical-Geochemical (F3G) Analysis of Tight Gas Production**”; a collaboration of LBNL (lead institution), Texas A&M University (Dr. Tom Blasingame, Petroleum Engineering Dept.) and Stanford University (Dr. Mark Zoback, Geophysics Dept.)
- Hydrate program coordinator and Principal Investigator (PI) of three hydrate projects funded by the National Energy Technology Laboratory of DOE (FY2000 to present), involving numerical simulations and laboratory experiments. In charge of numerical design and analysis of the first field test of gas production from a hydrate deposit, conducted by an international scientific consortium at the Mallik site, Northwest Territories, Canada in early 2002. Responsible for the design and analysis of a planned field test of gas production from permafrost hydrate deposits at the Mount Elbert site, to be conducted by BP Exploration (Alaska). In charge of laboratory studies for (a) the development of techniques for the production of large hydrate samples (pure and in porous media), (b) the non-destructive study of dissociation of artificial and natural hydrate-bearing cores using CT technology, (c) the study of relative permeability and kinetic hydrate dissociation (processes that are critical to gas production from hydrates), (d) the determination of key parameters describing hydrate behavior in porous media through history-matching of laboratory and field experiments.
- PI of a DOE-sponsored project on the interrelationship between global climate and hydrate dissociation in oceanic accumulations (collaboration with Climate Group of the Los Alamos national Laboratory).
- PI of a project sponsored by ConocoPhillips, which investigates the behavior of composite CH<sub>4</sub>-CO<sub>2</sub> hydrates through numerical simulations and laboratory experiments.
- Main developer of the TOUGH+ family of codes, the next generation of LBNL simulators for the simulation of fluid flow and transport in complex geologic media (a LDRD-funded project). The TOUGH+ family of codes is written in FORTRAN 95/2003, and their architecture is based on the principles of object-oriented programming.
- Developer of the TOUGH+HYDRATE code (scalar and parallel versions) for the simulation of hydrate dissociation and overall behavior in porous media. This code incorporates the most recent advances in hydrate science, and is used for the design and analysis of field tests and laboratory experiments of hydrate dissociation. A scientific panel convened by the National Academy of Sciences to review the DOE hydrates program (the funding agency supporting the code development) and report to Congress indicated that TOUGH+HYDRATE is “... a *small project with a major technological impact*” that “... *incorporates the best independently measured physical property data into a fundamental reservoir model*”. Since its release in April 2005, TOUGH+HYDRATE is being used by 25 organizations (in 15 countries) conducting hydrate research.
- PI of a NASA-funded project that aims to describe the thermal and fluid flow effects of a radioactive-fueled heat source buried in the Martian permafrost.
- In charge of the radionuclide transport studies (solutes and colloids) for the Yucca Mountain High-Level Radioactive Waste Repository. Main author of Yucca Mountain Modeling Report U060 (*Radionuclide Transport Under Ambient Conditions*), which provides support for the Repository Licensing Application process.
- Developer of the EOS9nT model (a member of the TOUGH2 family of codes) for the simulation of transport of radioactive solutes and colloids in the subsurface (used for all the Yucca Mountain studies).

- Developer of a new generation of conjugate gradient solvers, included in the most recent versions of the TOUGH2 family of codes.
- PI of the project "*Containment of Contaminants Through Physical Barriers from Viscous Liquids Emplaced Under Controlled Viscosity Conditions*", funded by the Subsurface Contamination Focus Area, Office of Technology Development of DOE. The project completed a successful pilot-scale field test in January 1995, and a medium-scale field demonstration (scheduled for FY 1997 at the Brookhaven national Laboratory) is currently being designed.
- PI of two other containment projects: (a) Testing Barrier Liquids (funded by DuPont) and (b) Repair of Landfill Closure Caps Using Barrier Liquids (funded by the Savannah River Site)
- PI of a LDRD project on a new generation of ferrofluids (fluids with special magnetic properties) for subsurface remediation and monitoring.
- In charge of numerical simulation of fate and transport of contaminants in support of the groundwater remediation effort at LBNL.

***April 1989 to  
October 1991***

**Research Engineer**

*Groundwater Research Program, WERC #205*

*Agr. Engineering Dept. & Civil Engineering Dept. (joint appointment)*

*Texas A&M University*

*Water Resources & Environmental Engineering, WERC #205*

*Civil Engineering Dept., Texas A&M University (April 1989 - Aug. 1990)*

In charge of the project "*Synthesis of Pneumatic and Hydraulic Controls for Hazardous Site Remediation*," which involved air barriers to control the migration of contaminants in the subsurface. Designed and developed the largest-in-the-world dual gamma-dual energy X-ray attenuation experimental facility (with a scanning area of 6'x7') to investigate basic phenomena of multi-phase flow through porous media, focusing on contamination containment and the evaluation of decontamination methods.

Developed (a) a family of new numerical methods, the Laplace Transform Finite Difference (LTFD), Finite Element (LTBE), and Boundary Element (LTBE) methods for flow and solute transport simulations, (b) 3-D, full two- and three-phase flow numerical models, used to describe the processes involved in groundwater contamination & decontamination, (c) a computer image analysis system for automatic aquifer parameter identification, and (d) a new matrix solver for multi-phase problems, the MEPC-D4, which reduces the computer time requirements by 50% to 82.5% and storage by 50%. Licenses and copyrights for items (a) through (d) have been awarded or are pending.

***Feb. 1987 to  
April 1989***

**Associate Engineer/Senior Scientist**

*International Rice Research Institute (United Nations - FAO)*

*Dept. of Water Management, P.O. Box 933, 1099 Manila, PHILIPPINES*

In charge of research programs in South and South-East Asia (Philippines, India, Pakistan, Malaysia, Thailand, Vietnam) and supervising a staff of 32. Responsible for (a) the development of hydraulic barriers to alleviate salt water intrusion into the main aquifer supplying Ho-Chi-Minh City (Saigon), and (b) the design of the groundwater development plan for the Terrai area of Nepal. Other responsibilities included (1) experiments on, and (2) development and testing of numerical simulation models for (a) water and vapor flow in rice soils, (b) large-scale (regional) groundwater flow and contaminant transport, (c) irrigation & drainage, (d) groundwater contamination by agricultural chemicals, and (e) drainage of acid sulphate soils.

***1980-1987***

**Research/Teaching Assistant**

*Texas Water Resources Institute & Dept. of Agricultural Engineering*

*Texas A&M University, College Station, Texas 77843*

Taught hydraulics, hydraulic engineering, flow through porous media, and thermodynamics for 5 years. Developed multi-dimensional fully implicit numerical models for (a) Single-phase flow, (b) Multi-phase flow, (c) Simultaneous mass and heat flow, and (d) Miscible contaminant transport in porous media.

**1979-1980****Chemical Engineer**

*Greek National Atomic Energy Commission*

*Nuclear Research Center "Democritus", Aghia Paraskevi 17643, GREECE*

Conducted research on the reaction kinetics of gamma-irradiated human hormonal solutions (a NATO-sponsored project).

**Summer 1979****Chemical Engineer Trainee**

*Radfontein Mining Corporation, Newcastle, SOUTH AFRICA*

Member of an operation research team analyzing possibilities for secondary platinum extraction from mine slag.

**Summer 1978****Chemical Engineer Trainee**

*Egyptian Salt and Soda Corporation, Muharambay, Alexandria, EGYPT*

Helped with the design, installation, operation and maintenance of an ion exchange and an electrolysis system.

**RESEARCH GRANTS & AWARDS**

Career total: **\$17,442,000** (April 1989 – March 5, 2012)

FY 2008 Awards:

**TOTAL = \$3,647,000** (\$1,010,000 from DOE, \$1,837,000 from RPSEA)

FY 2009 Awards:

**TOTAL = \$4,375,000** (\$175,000+480,000+360,000 from DOE; \$35,000+405,000 from ConocoPhillips; \$15,000 from CUG – China; \$2,900,000 from RPSEA)

FY 2010 Awards (October 1, 2009 – July 31, 2010):

**TOTAL = \$965,000** (165,000+\$445,000+305,000 from DOE; \$50,000 from KIGAM, Korea)

FY 2011 Awards (October 1, 2010 – Oct 10, 2011):

**TOTAL = \$1,167,000** (\$80K from Taisei Corporation, Japan + \$627K from Statoil, Norway + 450K from US EPA + \$10K from the U.S. DOE)

FY 2012 Awards (October 1, 2011 – March 5, 2012):

**TOTAL = \$475,000** (\$375K from the U.S. DOE (hydrate studies) + \$100K from KIGAM, South Korea)

**GRADUATE STUDENTS (Chair/Co-chair of Student's Committee)**

PhD's:	<i>Arvind Gupta:</i>	Chemical Engineering, Colorado School of Mines, 2007
	<i>Tarun Grover:</i>	Petroleum Engineering, Texas A&M University, 2008
	<i>Daegil Yang:</i>	Petroleum Engineering, Texas A&M University, May 2013 (expected)
	<i>Matt Freeman:</i>	Petroleum Engineering, Texas A&M University, May 2013 (expected)
	<i>Termpan Pitakbunkate</i>	Petroleum Engineering, Texas A&M University, May 2013 (expected)
MSc's:	<i>Doruk Alp:</i>	Petroleum Engineering, Middle East Technical University, 2007
	<i>Anastasios Boulis:</i>	Petroleum Engineering, Texas A&M University, 2008
	<i>Matt Freeman:</i>	Petroleum Engineering, Texas A&M University, May 2010
	<i>Olufemi Olorode:</i>	Petroleum Engineering, Texas A&M University, Dec 2012
	<i>Tioluwanimi Odunowo:</i>	Petroleum Engineering, Texas A&M University, May 2012
	<i>Sonia Jam:</i>	Petroleum Engineering, Texas A&M University, May 2012
	<i>Manuel Cossio:</i>	Petroleum Engineering, Texas A&M University, May 2012

Ryan S. Broussard: Petroleum Engineering, Texas A&M University, Dec 2012 (expected)  
 Kaushik Hazra: Petroleum Engineering, Texas A&M University, May 2013 (expected)  
 Kyung-Jae Lee: Petroleum Engineering, Texas A&M University, May 2013 (expected)

### HONORS, RECOGNITIONS & AWARDS

- 2012: 34<sup>th</sup> *International Geology Conference*, Brisbane, Australia, August 5-10, 2012: **Keynote Speaker (2 subjects)**
- 2012: *Lawrence Berkeley National Laboratory*, Berkeley, California, May 2012: **LBNL Director's Award for Exceptional Achievement**
- 2011: *Institute for Advanced Sustainability*, Potsdam, Germany, November 2011: **Invited Speaker**, conference on "Energy from clathrate hydrates"
- 2011: *U.S. Department of Energy*, Washington, DC, October 2011: **2011 Secretarial Honor Award** (highest non-monetary honor)
- 2010: *Society of Petroleum Engineers*: **Distinguished Member (Fellow Grade)**
- 2010: *Fiery Ice 2010: 7th International Workshop on Methane Hydrate Research & Development*, Te Papa, Wellington, New Zealand, May 10 - 12: **Keynote Speaker**
- 2009-2010: *Society of Petroleum Engineers*: **Distinguished Lecturer**
- 2009: *Goldschmidt Conference*, June 21-26, Davos, Switzerland: **Keynote Speaker**
- 2009: *Western Regional Meeting*, March-24-26, San Jose, California, *Society of Petroleum Engineers*: **Keynote Speaker**
- 2007: Editorial Board of *Water Resources Research*: **Outstanding Reviewer Award**
- 2006: *International Oil and Gas Conference and Exhibition*, 5-7 December, Beijing, *Society of Petroleum Engineers*: **Invited Speaker**
- 2006: *Lawrence Berkeley National Laboratory*: **Outstanding Performance Award** for contributions to the establishment and development of a hydrate research program at LBNL.
- 2006: *Lawrence Berkeley National Laboratory*: **Excellence in Technology Transfer** award, for the development of the TOUGH+ family of codes.
- 2005: Editorial Board of *Water Resources Research*: **Outstanding Reviewer Award**
- 1996: *Popular Science* magazine: **Best of What's New** award (which honors the 100 most promising new technologies), for the development of the subsurface barrier technology.
- 1995: *Lawrence Berkeley National Laboratory*: **Outstanding Performance Award** for contributions to the establishment and development of a subsurface barrier research program.

### OTHER PROFESSIONAL ACTIVITIES

Long-term appointments to Program Committees of Conferences of Professional Organizations:

- Offshore Technology Conference (OTC):** Member of advisory board to the SME member of the OTC Program Committee
- Arctic Technology Conference (ATC):** Program Committee Member, representing SME to the ATC

Organizing/Program Committees (member), Conferences of the *Society of Petroleum Engineers (SPE)* and/or the *Society for Mining, Metallurgy & Exploration (SME)*:

- 2014 SPE 7<sup>th</sup> International Petroleum Technology Conference (IPTC)**, Doha, Qatar, 20-22 January
- 2012 SPE 6<sup>th</sup> International Petroleum Technology Conference (IPTC)**, Beijing, China, 5-7 December
- 2012 SPE Canadian Unconventional Resources Conference (CURC)**, Calgary, Canada, 30 October - 1 November
- 2012 SPE Latin American and Caribbean Petroleum Engineering Conference (LACPEC)**, Mexico City, Mexico, 16-18 April (Chair of 2 sessions)
- 2011 SPE Canadian Unconventional Resources Conference (CURC)**, Calgary, Canada, 15-17 November (Session chair)
- 2011 SPE 5<sup>th</sup> International Petroleum Technology Conference (IPTC)**, Bangkok, Thailand, 15-17 November (Chair of 4 sessions)
- 2011 SPE Advanced Technology Workshop (IPTC)**, "Overcoming Difficulties in Conventional & Unconventional Gas Development", Sapporo, Hokkaido, Japan, 10-13 July
- 2011 Arctic Technology Conference (ATC)**, Houston, Texas, 7-9 February (Session organizer)
- 2010 SPE Latin American and Caribbean Petroleum Engineering Conference (LACPEC)**, Lima, Peru, 30 November - 3 December (session chair of 2 sessions)
- 2010 Canadian Unconventional Resources and International Petroleum Conference (CURIPC)**, Calgary, Alberta, Canada, 19-21 October
- 2010 SPE Unconventional Gas Conference**, Pittsburgh, Pennsylvania, 23-25 February
- 2010 SPE Western Regional Meeting**, Anaheim, California, 27-29 May
- 2010 Ninth International Oil & Gas Conference and Exhibition in China (IOGCE)**, Beijing, China, 8-10 June (Session Chair, Unconventional Resources)

**2009 International Conference on CO<sub>2</sub> Capture, Storage, and Utilization**, San Diego, California, 2–4 November

**2009 SPE Latin American and Caribbean Petroleum Engineering Conference (LACPEC)**, Cartagena, Colombia, 31 May – 3 June

**2008 SPE Tight Gas Development and Planning Workshop**, Hangzhou, China, 15-18 June

Organizer and Conference Chair:

**2012 TOUGH Symposium**, September 2012, Berkeley, California

**2009 TOUGH Symposium**, 14–16 September, Berkeley, California

Organizer and Session Chair:

**2010 Offshore Technology Conference**, 3–6 May, Houston, Texas (4 sessions)

**2008 Offshore Technology Conference**, 4–8 May, Houston, Texas (4 sessions)

## AFFILIATIONS

### *Professional*

American Geophysical Union

American Society of Agricultural Engineers

American Institute of Chemical Engineers

American Society of Civil Engineers,

American Society of Petroleum Engineers

Association of Ground Water Scientists and Engineers, NWWA

Society for Industrial and Applied Mathematics

Society for Mining, Metallurgy and Exploration (OTC Board Member, ATC Board Member)

## REVIEWING/EDITING

Transport in Porous Media (**Member of the Editorial Board; Associate Editor; Guest Editor of Special Issues**)

Journal of Natural Gas Science and Engineering (**Associate Editor**)

Journals of the Society of Petroleum Engineering (**Associate Editor, SPE Journal**)

Computers & Geosciences (**Guest Editor of Special Issues**)

Nuclear Technology (**Guest Editor of Special Issues**)

Water Resources Research

Journal of Contaminant Hydrology (Elsevier)

Journal of Hydrology (Elsevier)

Journal of Geophysical Review

Journal of Marine and Petroleum Geology

Journal of Geological Research

Journals of the American Society of Civil Engineers

Journal of Petroleum Science and Engineering

Journal of Petroleum Exploration and Production Technology

Journal of Canadian Petroleum Technology

Journal of Physical Chemistry

Proceedings of the National Academy of Sciences

American Mineralogist

ChemSusChem

Industrial and Engineering Chemistry Research

Chemical Engineering & Technology

Chemical Engineering Science

Energies

Energy and Fuels (American Chemical Society)

Energy Conversion and Management

International Journal of Numerical Methods for Heat and Fluid Flow

## PUBLICATION LIST

### 2012 JOURNAL PAPERS

- J-063 Rutqvist, J. and G.J. Moridis, *Coupled Multiphase Fluid Flow and Wellbore Stability Analysis Associated with Gas Production from Oceanic Hydrate-Bearing Sediments*, Paper PETROL3753R1, In Press, **Journal of Petroleum Science and Engineering**
- J-062 Cossio, M., G.J. Moridis, and T. Blasingame, *A Semi-Analytic Solution for Flow in Finite-Conductivity Vertical Fractures Using Fractal Theory*, Paper SPE 153715, In Press, **SPE Journal** (doi: 10.2118/153715-PA)
- J-061 Kim, J., G.J. Moridis, and J. Rutqvist, *Coupled Flow and Geomechanical Analysis for Gas Production in the Prudhoe Bay Unit L-106 Well Unit C Gas Hydrate Deposit in Alaska*, Paper PETROL3889R1, In Press, **Journal of Petroleum Science and Engineering**, electronically available from <http://dx.doi.org/10.1016/j.petrol.2012.04.012> (doi: 10.1016/j.petrol.2012.04.012)
- J-060 Kim, J., G.J. Moridis, D. Yang, and J. Rutqvist, *Numerical Studies on Coupled Flow and Geomechanics in Hydrate Deposits*, Paper SPE 141304, **SPE Journal**, 17(2), 485-501, 2012 (doi: 10.2118/141304-PA)

### 2012 REPORTS, CONFERENCE PAPERS & ARTICLES

- R-175 Kim J., and G.J. Moridis, *Gas Flow Tightly Coupled to Elastoplastic Geomechanics for Tight and Shale Gas Reservoirs: Material Failure and Enhanced Permeability*, SPE Paper 155640, Proceedings, Americas Unconventional Resources Conference, 5-6 June 2012, Pittsburgh, Pennsylvania.
- R-174 Kim J., and G.J. Moridis, *Modeling and Numerical Simulation for Coupled Flow and Geomechanics in Composite Gas Hydrate Deposits*, 46th U.S. Rock Mechanics/Geomechanics Symposium, 24-27 June 2012, Chicago, Illinois
- R-173 Kim J., and G.J. Moridis, *Numerical Studies for Naturally Fractured Shale Gas Reservoirs: Coupled Flow and Geomechanics in Multiple Porosity/Permeability Materials*, 46th U.S. Rock Mechanics/Geomechanics Symposium, 24-27 June 2012, Chicago, Illinois
- R-172 Freeman, C.M., G.J. Moridis, G.E. Michael and T.A. Blasingame, *Measurement, Modeling, and Diagnostics of Flowing Gas Composition Changes in Shale Gas Wells*, 2012, SPE Paper 153391, Proceedings, SPE Latin American and Caribbean Petroleum Engineering Conference, Mexico City, Mexico, 16-18 April 2012 (in review, **SPE Journal**)
- R-171 Cossio, M., G.J. Moridis and T.A. Blasingame, *A Semi-Analytic Solution for Flow in Finite-Conductivity Vertical Fractures Using Fractal Theory*, 2012, SPE Paper 153715, Proceedings, SPE Latin American and Caribbean Petroleum Engineering Conference, Mexico City, Mexico, 16-18 April 2012 (in review, **SPE Journal**).
- R-170 Olorode, O.M., Freeman, C.M., G.J. Moridis and T.A. Blasingame, *High-Resolution Numerical Modeling of Complex and Irregular Fracture Patterns in Shale Gas and Tight Gas Reservoirs*, 2012, SPE Paper 152482, Proceedings, SPE Latin American and Caribbean Petroleum Engineering Conference, Mexico City, Mexico, 16-18 April 2012 (in review, **SPE Reservoir Evaluation & Engineering**).

## 2011 JOURNAL PAPERS

- J-059 Zhang, K., G. Moridis and K. Pruess, *TOUGH+CO<sub>2</sub>: A multiphase fluid-flow simulator for CO<sub>2</sub> geologic sequestration in saline aquifers*, **Computers & Geosciences**, **37**(6), 714-723, June 2011. (doi:10.1016/j.cageo.2010.09.011).
- J-058 Oldenburg, C.M., B.M. Freifeld, K. Pruess, L. Pan, S. Finsterle, and G.J. Moridis, *Numerical Simulations of the Macondo Well Blowout Reveal Strong Control of Oil Flow by Reservoir Permeability and Exsolution of Gas* – Electronic copy available, **Proceedings of the National Academy of Sciences**, 2011. (doi: 10.1073/pnas.1105165108).
- J-057 Freeman, C.M., Moridis, G., and T. Blasingame, *A Numerical Study of Microscale Flow Behavior in Tight Gas and Shale Gas Reservoir Systems*, **Transport in Porous Media**, **90**, 253-268, 2011. (doi: 10.1007/s11242-011-9761-6).
- J-056 Moridis, G.J., M.T. Reagan, K.L. Boyle, and K. Zhang, *Evaluation of the Gas Production Potential of Challenging Hydrate Deposits*, **Transport in Porous Media**, **90**, 269-299, 2011. (doi: 10.1007/s11242-011-9762-5).
- J-055 Moridis, G.J., and M.T. Reagan, *Estimating the Upper Limit of Gas Production From Class 2 Hydrate Accumulations in the Permafrost, 2: Alternative Well Designs and Sensitivity Analysis*, **J. Petr. Sci. Eng.**, **76**, 124-137, 2011 (doi:10.1016/j.petrol.2010.12.001).
- J-054 Moridis, G.J., and M.T. Reagan, *Estimating the Upper Limit of Gas Production From Class 2 Hydrate Accumulations in the Permafrost, 1: Concepts, System Description and the Production Base Case*, **J. Petr. Sci. Eng.**, **76**, 194-201, 2011 (doi:10.1016/j.petrol.2010.11.023).
- J-053 Moridis, G.J., T.S. Collett, M. Pooladi-Darvish, S. Hancock, C. Santamarina, R. Boswell, T. Kneafsey, J. Rutqvist, M. Kowalsky, M.T. Reagan, E.D. Sloan, A.K. Sum and C. Koh, *Challenges, Uncertainties and Issues Facing Gas Production From Gas Hydrate Deposits*, **SPE Res. Eval. & Eng.**, **14**(1), 76-112, 2011 (SPE-131792-PA. doi: 10.2118/131792-PA).
- J-052 Elliott, S.M., M. Maltrud, M.T. Reagan, G. Moridis, and P.J. Cameron-Smith, *Marine Methane Cycle Simulations for the Period of Early Global Warming*, **J. Geoph. Res.**, **116**, 2011, G01010, doi: 10.1029/2010JG001300, 2011 (LBNL-3389E).
- J-051 Anderson, B.J., M. Kurihara, M.D. White, G.J. Moridis, S.J. Wilson, M. Pooladi-Darvish, M. Gaddipati, Y. Masuda, T.S. Collett, R.B. Hunter, H.Narita, K.Rose, and R. Boswell, *Regional long-term production modeling from a single well test, Mount Elbert Gas Hydrate Stratigraphic Test Well, Alaska North Slope*, **J. Marine Petrol. Geol.**, **28**, 493-501, 2011 (doi: 10.1016/j.marpetgeo.2010.01.015).
- J-050 Moridis, G.J., S. Silpngarmlert, M.T. Reagan, T.S. Collett, and K. Zhang, *Gas Production From a Cold, Stratigraphically Bounded Hydrate Deposit at the Mount Elbert Site, North Slope, Alaska*, **J. Marine Petrol. Geol.**, **28**, 517-534, 2011 (doi: 10.1016/j.marpetgeo.2010.01.005, LBNL-3005E).

## 2011 REPORTS, CONFERENCE PAPERS & ARTICLES

- R-169 Oldenburg, C.M., B.M. Freifeld, K. Pruess, L. Pan, S. Finsterle and G.J. Moridis, *Oil and Gas Flow-Rate Estimate for the 2010 BP Macondo Well Blowout: A Numerical Simulation Approach*, 2011, submitted to the **Proceedings of the National Academy of Sciences** for publication in the Special Issue on Flow Rate Estimates for the BP Macondo Well Blowout.



- R-168 Boswell, R., G. Moridis, M. Reagan and T.S. Collett, *Gas Hydrates Accumulation Types and Their Application to Numerical Simulation*, Proceedings, 7<sup>th</sup> International Conference on Gas Hydrates (ICGH 2011), Edinburg, Scotland, United Kingdom, July 17-21, 2011.
- R-167 Kim, J., D. Yang, G.J. Moridis, and J. Rutqvist, *Numerical Studies on Coupled Flow and Geomechanics in Hydrate Deposits*, Paper SPE 141304, 2011 Reservoir Simulation Symposium, The Woodlands, Texas, 21-23 February 2011.
- R-166 Rutqvist, J., G.J. Moridis, J. Kim and M.T. Reagan, *Geomechanical Performance Analysis of Potential Long-Term Tests of Gas Production from Hydrate Deposits in the North Slope, Alaska*, Paper OTC 22154, 2011 Arctic Technology Conference, Houston, Texas, 7-9 February 2011.
- R-165 Kneafsey, T. J., and G.J. Moridis, *Methane Hydrate Dissociation by Depressurization in a Mount Elbert Sandstone Sample: Experimental Observations and Numerical Simulations*, Paper OTC 944097, 2011 Arctic Technology Conference, Houston, Texas, 7-9 February 2011.
- R-164 Reagan, M.T., G.J. Moridis, S.M. Elliott, and M. Maltrud, *Simulation of Arctic Gas Hydrate Dissociation in Response to Climate Change: Basin-Scale Assessment*, Paper OTC 22153, 2011 Arctic Technology Conference, Houston, Texas, 7-9 February 2011.
- R-163 Moridis, G.J., M.T. Reagan, H. Anderson-Kuzma, Y. Zhao, K. Boyle, and J. Rector, *Evaluation of the Hydrate Deposit at the PBU L-106 Site, North Slope, Alaska, for a Long-Term Test of Gas Production*, Paper OTC 944482, 2011 Arctic Technology Conference, Houston, Texas, 7-9 February 2011.

## 2010

### JOURNAL PAPERS

- J-049 Li, G., G.J. Moridis, K. Zhang and X.-S. Li, *Evaluation of Gas Production Potential from Marine Gas Hydrate Deposits in Shenhu Area of the South China Sea*, **Energy & Fuels**, 24,6018-6033, 2010 (doi: 10.1021/ef100930m)
- J-048 Elliott, S.M., Reagan, M.T., Moridis, G.J., Cameron-Smith, P.J., *Geochemistry of Clathrate-Derived Methane in Arctic Ocean Waters*, **Geophys. Res. Lett.**, 37, L12607, doi:10.1029/2010GL043369, 2010 (LBNL-3389E).
- J-047 Kowalsky, M.B., S. Nakagawa, S., and G.J. Moridis, *Feasibility of Monitoring Gas-Hydrate Production With Time-Lapse Vertical Seismic Profiling*, **SPE Journal**, 15(3): 634-645, 2010. doi:10.2118/132508-PA (SPE-132508-PA, LBNL-3091E).

## 2010

### REPORTS, CONFERENCE PAPERS & ARTICLES

- R-162 Moridis, G.J., T. Blasingame and C.M.Freeman, *Analysis of Mechanisms of Flow in Fractured Tight-Gas and Shale-Gas Reservoirs*, Paper SPE 139250, 2010 SPE Latin American & Caribbean Petroleum Engineering Conference, Lima, Peru, 1–3 December 2010.
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## Patents

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- P-002 Patent No.: **6,250,848 B1**, *Process for Guidance, Containment, Treatment, and Imaging in a Subsurface Environment Utilizing Ferrofluids*, issued on June 26, 2001.
- P-001 Patent No.: **5,836,390**, *A Method for Formation of Subsurface Barriers Using Viscous Liquids*, issued on November 17, 1998.