



**DAN A. BILLMAN, P.G.**  
**PRESIDENT / GEOLOGIST**  
**BILLMAN GEOLOGIC CONSULTANTS, INC.**

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***SUMMARY OF QUALIFICATIONS***

- Geologic, technical and economic reviews of natural gas and oil exploration prospects in the Appalachian Basin, Black Warrior Basin, Anadarko Basin, Delaware/Permian Basin, Fort Worth Basin, East Texas Basin, and Illinois Basin.
- Over twenty-four years of gas well drilling experience including: drilling/siting recommendations, rock/core analysis, electric log analysis and reserves calculations, well completion/frac treatment recommendations and decisions, and oversight of production casing and baffle installation in gas wells. Includes Trenton/Black River carbonates, Utica Shale, Marcellus Shale and Upper Devonian tight gas sand reservoirs.

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***PROFESSIONAL HISTORY***

March 1993 to present	<b>PRESIDENT/CONSULTING GEOLOGIST</b> Billman Geologic Consultants, Inc., Mars, PA
October 1992 to March 1993	<b>ASSISTANT GEOLOGIST II</b> Michael Baker Jr., Inc., Beaver, PA
June 1990 to July 1992	<b>PROJECT GEOLOGIST</b> Eastern States Exploration Co., Snow Shoe, PA
May 1989 to June 1990	<b>GEOLOGIST</b> Mark Resources Corporation, Pittsburgh, PA

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***EDUCATION AND TRAINING***

Master of Science Degree, Geology, West Virginia University, 1989  
Master's Thesis: Microstructural Analysis in the Ordovician-Mississippian Cover above the Alleghanian Thrust System of the Valley and Ridge Province, West Virginia and Virginia  
Bachelor of Science Degree, Geology, University of Toledo, 1986

**Misc. Training:**

Re-Assessing the Technically Recoverable Undiscovered Hydrocarbon Resources of the Marcellus Shale, PTTC/USGS, March 2011  
Marcellus Shale Resources Assessment and Logging School, PTTC, November 2010  
Quality Control of Subsurface Mapping, Instructor: Dan Tearpock, SCA, LLC, September 2010  
Marcellus Shale Land Law, Half Moon, LLC, May 2010  
Marcellus and Utica Shales in New York State: Field Trip and Core Workshop, PTTC, April 2010  
Seismic Imaging of Structural, Stratigraphic and Diagenetic Plays, PTTC, March 2003  
Reservoir Characterization of the Upper Devonian Elk Sands in the Appalachian Basin, PTTC, September 2000

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***PROFESSIONAL REGISTRATION AND AFFILIATIONS***

Registered Professional Geologist in the Commonwealth of Pennsylvania, #PG-000554-G  
Pennsylvania Council of Professional Geologists, Board Member and Marcellus Shale Committee chair, 2010-present  
American Association of Petroleum Geologists, 1985-present  
- AAPG Certified Petroleum Geologist, #5933  
- Treasurer of the Division of Professional Affairs, FY 2010-2012  
- Member of the Energy Minerals Division and Division of Environmental Geosciences  
- Eastern Section Treasurer 2004-2005; Secretary 2005-2006, V.P. 2006-2007, President 2007-2008  
- Eastern Section AAPG, Distinguished Service Award recipient, 2009  
- AAPG Delegate representing the Pittsburgh Geological Society, 2002-present  
Pittsburgh Association of Petroleum Geologists, 1989-present  
- Treasurer 1994-96, President 1997-99, Vice-president 2004-2005  
Pittsburgh Geological Society, 1989-present  
Ohio Geological Soc., Appalachian Geological Soc., Ontario Petroleum Institute, Buffalo Assoc. of Professional Geol.  
Independent Oil & Gas Associations of Ohio, Pennsylvania & New York

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**REPRESENTATIVE PROJECT EXPERIENCE****Oil and Gas Exploration and Production**

- Geologic, technical and economic review of prospective oil and gas exploration/development acreage and wells: Appalachian, Illinois, East Texas, Fort Worth, Delaware/Permian, Anadarko, and Black Warrior Basins
- Completion decisions and aid in design considerations for reservoirs including Trenton/Black River carbonates, Utica Shale, Marcellus Shale and Upper Devonian tight gas sand reservoirs.
- Field geologist for drill cutting analysis/mudlogging, well site evaluations/reserves estimates and electric logging (including sonic logging, dip meter oversight and side-wall coring), northwestern and central Pennsylvania, south-central Ohio, and southern Illinois Basins.
- Research of log, drilling, completion, and production data for select wells and incorporation of data into clients' computer databases.
- Well log interpretation, analysis and correlation for up-hole/behind pipe potential evaluations.
- Detailed regional mapping, log analysis and reservoir description to delineate drill sites for Devonian through Cambrian targeted acreage positions, Pennsylvania, Ohio, West Virginia and New York.
- Coordinated onsite/offsite petrographic/geologic analysis for full bore core/sidewall coring projects.
- Geologic and economic evaluation of acquisition submittals from third parties.
- Geologic review of gas storage fields in western Pennsylvania.
- Conducted numerous New York State Energy and Research Development Association (NYSERDA) sponsored projects including: Trenton/Black River potential of eastern New York, northern and eastern New York hydrocarbon potential and southwestern Chautauqua Co, NY hydrocarbon potential.

**Coal Resource Evaluation**

- Geologic and economic review of prospective coal acreage, northwestern PA
- Prepared Geologic, Hydrogeologic, Erosion & Sedimentation controls and other modules of the "PADER Application for Permit of a Bituminous Coal Mine"
- Prepared Phase I water feasibility studies in areas of severe coal mining for WVDEP
- Prepared cross-section and profiles for strip mine reclamation sites for WVDEP projects
- Logging and coring of test boreholes in coal refuse at reclamation sites, southern WV
- Constructed geologic cross sections and fracture maps for deep mine PADER Application for Permit.

**Geotechnical and Hydrogeological Evaluations**

- Field geologist for investigative coring/boreholes, for road and bridge design projects (soil and core logging, well installation and sampling)

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**PUBLICATIONS & PRESENTATIONS**

Billman, D.A. and Holliday, V.E., Gas Shale Occurrence and Impacts in the Delaware River Basin: A Geologic Perspective, Presented at Forest Management, Water Resources and Energy Development: Challenges for the Delaware River Basin, Meeting of the Water Resources Association of the Delaware River Basin, October 26, 2010

Skoff, D.E. and Billman, D.A., Brine Disposal Wells—An Underutilized Resource for Marcellus Flowback and Produced Water Management in Pennsylvania., Presented at the Pennsylvania IOGA/POGAM 2010 Technical & Environmental Issues Seminar, April 7, 2010.

Billman, D.A. and Martin, J.P., 2009, Comparison of the Utica Shale Reservoir Characteristics of Quebec, Canada and NY / PA, USA., Presented at the Eastern Section AAPG Meeting, Evansville, IN, September 20-22, 2009.  
<http://www.searchanddiscovery.net/abstracts/html/2009/eastern/abstracts/billman.htm>

Skoff, D.E. and Billman, D.A., The Role of the Petroleum Geologist in Siting and Permitting Brine Disposal Wells for Marcellus Shale Flowback Water., Presented at the Eastern Section AAPG Meeting, Evansville, IN, September 20-22, 2009.  
<http://www.searchanddiscovery.net/abstracts/html/2009/eastern/abstracts/skoff.htm>

Billman, D.A. and Martin, J.P., 2009, Utica Shale Exploration of the Northern Appalachian Basin., Presented at New York Independent Oil & Gas Association, Clymer, NY, July 8, 2009.

Billman, D.A. and Martin, J.P., 2009, Geological Overview of the Utica Shale Play., Presented at Developing Unconventional Gas Conference, Fort Worth, TX, April 8, 2009.

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*PUBLICATIONS (CONTINUED)*

- Billman, D.A. 2008, Geological Overview of Appalachian Shale Plays., Presented at IHS NAPE Forum, Houston, TX, August 8, 2008, Pittsburgh Geologic Society Meeting, Pittsburgh, PA, November 19, 2008, AAPL Forum, NAPE, Houston, TX, February 4, 2009 and AAPL Meeting, Pittsburgh, PA April 17, 2009. <http://energy.ihs.com/NR/rdonlyres/55CF48D6-FB02-4AD2-860D-8DF528AC9C6D/0/f11billmanshaleihsnapepresentation82608.pdf>
- Billman, D.A. 2008, Upper Devonian Sandstone Drilling Activity and Mapping in Pennsylvania., Presented at PTTC Upper Devonian Reservoirs of the Appalachian Basin Seminar, Washington, PA, May 26, 2005.
- Laughery, C.D., Billman, D.A., and Canich, M.R., 2004. Petroleum Geology and Geochemistry of the Council Run Gas Field, North Central Pennsylvania, AAPG Bulletin, v. 88, No. 2, Pp. 213-239. <http://www.dcnr.state.pa.us/topogeo/oilandgas/councilrun.pdf>
- Billman, D.A. and Comini, M., 2003, Geologic Re-interpretation and Production Prediction of an Upper Devonian (Lower Bradford Group) Field in Central Pennsylvania., Presented at the Eastern Section AAPG Meeting, Pittsburgh, PA, September 7-10, 2003. [http://www.searchanddiscovery.net/abstracts/pdf/2003/eastern/ndx\\_billman01.pdf](http://www.searchanddiscovery.net/abstracts/pdf/2003/eastern/ndx_billman01.pdf)
- Billman, D.A., 2003, A Review of Upper Devonian, Elk Sandstone Exploration and Development in Pennsylvania: Random Thoughts on Potential Pitfalls., Presented at the Eastern Section AAPG Meeting, Pittsburgh, PA, September 7-10, 2003. [http://www.searchanddiscovery.net/abstracts/pdf/2003/eastern/ndx\\_billman02.pdf](http://www.searchanddiscovery.net/abstracts/pdf/2003/eastern/ndx_billman02.pdf)
- Billman, D.A. and Fagan, J.P., 2003, Investigation of the Under-Explored Cambrian and Ordovician of Southwestern Chautauqua County, NY, Presented at the Northeastern Geological Society of America Meeting, Halifax, Nova Scotia, Canada, March 27-29, 2003.
- Billman, D.A. and Fagan, J.P., 2002, Investigation of the Under-Explored Cambrian and Ordovician of Southwestern Chautauqua County, NY, Presented at the Joint Ontario Petroleum Institute/New York Independent Oil & Gas Association Meeting, November 4-6, 2002.
- Laughery, C.D., Billman, D.A., and Canich, M.R., 2001. Facies Architecture of Lowstand, Transgressive and Highstand Tracts in the Upper Devonian Lock Haven Formation, Council Run Field, North-Central Pennsylvania, In Sequence Stratigraphic and Allostratigraphic Principles and Concepts, 2001AAPG Hedberg Research Conference, August 26-29, 2001, Page 33. [http://www.searchanddiscovery.net/abstracts/pdf/2005/2001hedberg/ndx\\_laughrey.pdf](http://www.searchanddiscovery.net/abstracts/pdf/2005/2001hedberg/ndx_laughrey.pdf)
- Jacobi, R.D., Cruz, K., and Billman, D.A., 2000, Geologic Investigation of the Gas Potential in the Otsego County Region, Eastern New York State, Final Phase One Report. Report completed in Conjunction with Millennium Natural Resource Development and the New York State Energy Research and Development Authority. [http://esogis.nysm.nysed.gov/esogisdata/downloads/NYSERDA/4863-ERTER-ER-99/Text/Mill%20fnl%20rpt%20pdf1%2010\\_24.pdf](http://esogis.nysm.nysed.gov/esogisdata/downloads/NYSERDA/4863-ERTER-ER-99/Text/Mill%20fnl%20rpt%20pdf1%2010_24.pdf)
- Billman, D.A., 2000, New Geophysical and Geologic Data for Natural Gas Exploration in Eastern New York, Presented at the Fall 2000 New York Independent Oil & Gas Association.
- Laughery, C.D., Billman, D.A., and Canich, M.R., 2000. Petroleum Geology and Geochemistry of the Council Run Gas Field, North Central Pennsylvania. Included in the PTTC Focused Technology Workshop: Reservoir Characterization of the Upper Devonian Elk Sands in the Appalachian Basin, 9/7/2000.
- Laughery, C.D., Billman, D.A., and Canich, M.R., 1999. Geology of the Council Run Gas Field, North-Central Pennsylvania: Implications for Energy Resource Development in the Eastern Plateaus Province of the Central Appalachian Basin. Eastern Section American Association of Petroleum Geologists, (Eastern AAPG Meeting abstract).
- Billman, D.A., 1999, Hydrocarbon Potential in the St. Lawrence Lowlands of Northern New York, Contract 4550-ERTER-ER-97, report completed for New York Energy Research and Development Authority. <http://esogis.nysm.nysed.gov/esogisdata/downloads/NYSERDA/4550-ERTER-ER-97/Text/billman.pdf>

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PUBLICATIONS (CONTINUED)

Billman, D.A., and Fagan, J.P., 1998. Hydrocarbon Potential of the St. Lawrence Lowlands of Northern New York: A Frontier Basin Investigation. Eastern Section American Association of Petroleum Geologists, AAPG Bulletin, v. 82, no.9, p. 1765. (Eastern AAPG Meeting abstract)

<http://www.searchanddiscovery.net/abstracts/html/1998/eastern/abstracts/1765a.htm>

Laughery, C.D., Billman, D.A., and Canich, M.R., 1998. Facies Architecture of Lowstand, Transgressive and Highstand Tracts in the Upper Devonian Lock Haven Formation, Council Run Field, North-Central Pennsylvania. Eastern Section American Association of Petroleum Geologists, AAPG Bulletin, v. 82, no.9, p. 1769 - 1770. (Eastern AAPG Meeting abstract) (Presentation was awarded the Vincent E. Nelson Memorial Best Poster Award.)

<http://www.searchanddiscovery.net/abstracts/html/1998/eastern/abstracts/1769e.htm>

Billman, D.A., Smosna, R. and Bruner, K.R., 1991. Petrology, Porosity Development and Diagenesis of the Upper Devonian Elk Sands, Council Run Field, Centre and Clinton Counties, Pennsylvania: AAPG Bulletin, v. 75, no.8, p. 1379. (Eastern AAPG Meeting abstract) <http://www.searchanddiscovery.net/abstracts/html/1991/eastern/abstracts/1379b.htm>

Billman, D.A., 1989. Microstructural Analysis in the Ordovician-Mississippian Cover above the Alleghanian Thrust-system of the Valley and Ridge Province, West Virginia and Virginia, Unpublished Master's Thesis.

Billman, D.A., Johnston, M.A. and Dunne, W.M., 1989. Penetrative Strain Contribution to Cover Deformation in the Central Appalachians: Appalachian Basin Industrial Associates, Spring Meeting, 1989, v. 15, p. 147-165.

Dunne, W.M., Billman, D.A., Johnston, M.A., Rohaus, D.M., and Gerritsen, S., 1988. Cover Deformation above Foreland Thrust Systems and Strains in Sandstones: GSA Abstracts with Programs, Annual Meeting, v. 20, no. 7, p. A57.

Billman, D.A., Johnston, M.A. and Dunne, W.M., 1988. Role of Strain for Cover Geometry in the Valley and Ridge of West Virginia: AAPG Bulletin, v. 72, no.8, p.956. (Eastern AAPG Meeting abstract)