



P·A·P·G

Pittsburgh Association of
Petroleum Geologists

An AAPG Affiliated Society

www.papgrocks.org

PAPG 'Virtual' Lunch Meeting: Noon, Thursday, February 18th, 2021

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The War for Porosity: Competition for Underground Storage in the Appalachian Basin



Dan Billman

Billman Geologic Consultants

BS Geology, Toledo State University

MS Geology, West Virginia University

Abstract:

The Appalachian Basin is not only a Super Basin, but arguably the oldest and most populous Super Basin. Productive portions of the basin span part of New York, Pennsylvania, Ohio, West Virginia, Maryland, Virginia, Kentucky, and Tennessee and within or nearby the population centers one thinks of when mentioning these states. All those people can be difficult to drill around, but they also provide an opportunity for this "mature" Super Basin. All those people require energy in some form or fashion and meeting those energy demands will require underground storage in many formations for differing products.

The shale revolution in Appalachia continues and as we find more natural gas, we will need underground natural gas storage, allowing for natural gas withdrawal on demand when furnaces are turned up or when used to produce electricity. But as we move into the future and consider the increased availability of natural gas liquids produced from shales, even more storage is needed. Shell's mammoth ethane cracker plant is being built in Beaver County, PA right now, and so the need for ethane storage opportunities is now. Further, as the energy industry reaches toward the use of alternative fuels, for example, hydrogen energy, additional storage facilities will need to be considered and discovered for that hydrogen. Also, new storage will continue to be needed for electric generation plants that can capture and sequester carbon dioxide. Finally, as we continue to drill, to provide the energy for the above opportunities, we will need to find places to dispose of water and underground saltwater disposal wells are one tool for disposing flowback and produced water.

You can boil down a petroleum geologist's job as looking for porosity and permeability (hopefully with hydrocarbon in it). It tends to be the engineer's job to try to get the hydrocarbon out of the ground. We need to turn that thinking upside down and Appalachian petroleum geologists need to be looking for porosity and permeability for storage and disposal opportunities to inject product into, not pull product out of. The end of the productive life of the Appalachian Basin is long ahead of us, but to keep that "end of days" well into the future, we need to find storage opportunities for the energy we are producing today and will discover in the future.



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Dan Billman Biography

Dan Billman has over thirty-two years of experience in the Appalachian Basin with the last twenty-seven as a consulting geologist and president of Billman Geologic Consultants, Inc. Prior to independent consulting, Dan worked as an exploration and development geologist for Mark Resources Corporation and Eastern States Exploration Company. Currently, Dan is also a principal and senior geologic advisor at STL Resources, LLC and Fusilier Resources, LLC. Mr. Billman is a registered Professional Geologist (PG) in the state of Pennsylvania and an American Association of Petroleum Geologist, Certified Petroleum Geologist (CPG).

Recently and most notably, Mr. Billman worked closely with the Rice family as consultant and senior geologic advisor as Rice Energy Inc. acquired its initial acreage positions in the Appalachian Basin. Mr. Billman worked with the Rice family, in building what became a major company in the Marcellus and Utica Shale plays. Mr. Billman was involved from inception to initial public offering through sale of the company to EQT Corporation.

Dan Billman has extensive development and exploration experience in both unconventional (shales and tight gas sandstones) and legacy, conventional plays and reservoirs in the Appalachian Basin. He has performed numerous geologic and economic reviews of natural gas and oil exploration prospects throughout Appalachian Basin, as well as feasibility studies for gas storage, coal bed methane development and saltwater disposal wells. Mr. Billman has written and/or co-authored numerous published papers and technical presentations on the petroleum geology of the Appalachian Basin.

Mr. Billman received his Bachelor of Science degree in Geology from the University of Toledo (Ohio) and his Master of Science degree in Geology from West Virginia University. He is a member of the American Association of Petroleum Geologists (AAPG) and is currently the AAPG Delegate representing the Pittsburgh Geological Society and Advisory Council member, representing the Eastern Section. Also, Mr. Billman is a Past-President of the Eastern Section of the American Association of Petroleum Geologists, after serving as the organizations Vice-president, Secretary and Treasurer. He is a former President (2 terms), Vice-President and Treasurer (2 terms) of the Pittsburgh Association of Petroleum Geologists. Mr. Billman is a member of the Independent Oil and Gas Association of Pennsylvania, the Pittsburgh Association of Petroleum Geologists, Pittsburgh Geological Society, Ohio Geological Society, Appalachian Geological Society, Buffalo Association of Professional Geologists and Northern Alleghenies Geological Society. Mr. Billman is currently a board member of the Pennsylvania Independent Oil and Gas Association.

Meeting & Registration Details

Date: Thursday, February 18th, 2021

Location: Virtually (Google Meet)

Time: 12:00pm - 2:00pm (Speaker & Questions)

Cost: Open to PAPG members (with \$35 annual membership); \$10 for non-members

Registration/Logistics:

- ✓ Please RSVP by registering online: <https://www.papgrocks.org/meetings/upcoming-meeting>
- ✓ You will receive an email with registration confirmation and meeting login information
- ✓ Meeting participants will be muted when they join the meeting. There will be a Q&A session immediately following the speaker's presentation

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