



K. Scott Keim

Current Position

Chief Executive Officer & Partner

Profession

Geologist

Years' Experience

35+

Education

BS - Geosciences, The Pennsylvania State University, University Park, PA (1981)

Professional Registrations

CPG - AIPG

PG - KS, KY, VA

Affiliations

American Institute of Professional Geologists

Society of Mining Engineers, AIME

Former Board of Directors – The Penn State Research Foundation

Advisory Board – VA Center for Coal and Energy Research (Associated with VA Tech)

Summary of Experience

Mr. Keim is CEO and Partner of Marshall Miller & Associates, Inc. (MM&A). He directs energy and mineral resources activities including reserve evaluations, predictive geological mapping, merger and acquisition evaluations, geological and engineering applications, feasibility studies, coal quality assessments, and wire-line geophysical applications.

Significant Projects

- > Managed mining feasibility studies in China, Australia, Venezuela, and the United States
- > Coordinated a multitude of major merger and acquisition studies involving the largest transactions in the coal industry.
- > Conducted a variety of evaluations related to the prediction and impact of underground mining conditions and definition of surface reserve potential.
- > Responsible for managing multiple U.S. Securities and Exchange Commission independent reserve filings for publicly traded companies.
- > Coordinated filings in compliance with Australasian Joint Ore Reserve Committee (JORC) and Canadian 43-101 Standards.

Specific International Projects

- > **Australia:** Coordinated a definitive feasibility study for a combined surface and underground coal mine. This included the management of multiple engineering, geological, and environmental firms located in both Australia and the U.S.
- > **Turkey:** Evaluated lignite deposits in the Elbistan District located in southern Turkey.
- > **Colombia:** Prepared reserve assessments for multiple mining concessions and participated in merger and acquisition evaluations of coal mining operations.
- > **China:** Coordinated the evaluation of a billion-tonne reserve base. The evaluation included a geological reserve study, engineering assessment, financial modeling, environmental study, coalbed methane degas and development, and production scheduling. Total project investment was approximately \$500 million (U.S.).
- > **Venezuela:** Evaluated coal reserves located within the Guasare coal basin. This included implementation of an exploration program and the development of a multi-million-dollar exploration budget. Also served as technical advisor to joint venture participants and supervised contract geophysical logging.

Specific United States Projects

- > **Central Appalachian Basin:** Managed multiple due-diligence evaluations associated with merger and acquisition activities. Project parameters included reserve evaluation, Phase 1 environmental site assessment, asset appraisal, mine planning, and financial modeling. Performed work for most of the major energy and land companies with operations and properties located in the Appalachian Basin.
- > **Securities and Exchange Commission (SEC):** Supervised multiple projects associated with SEC filings.



Specific United States Projects (Continued)

- > **United States:** Evaluated coalbed methane reserves in every coal basin within the U.S. for a major U.S. coal producer. This report was used to develop a production strategy for the company and to prioritize properties for development.
- > **West Virginia, Pennsylvania and Kentucky:** Evaluation of numerous deep mineable reserve blocks for longwall development. Projects included seam, roof and floor mapping, geotechnical analysis, hazards/productivity mapping, in-situ stress studies and coal quality processing.
- > **West Virginia:** Investigation and reserve delineation for a multiple million ton per year mining operation. The evaluation was used to confirm reserve tonnage and coal quality for utility contract procurement.
- > **Illinois:** Evaluation of surface mineable reserve base for a multiple million ton per year operation.
- > **Illinois:** Evaluation of deep mineable reserve base for continued longwall development.
- > **Western Kentucky:** Investigation and reserve delineation of both surface and deep mineable reserves involving multiple coal seams throughout a three-county area.
- > **Northern and Central West Virginia:** Regional investigation and exploration of deep and surface mineable coals. Supervised multiple drill rig exploration program, reserve mapping, and hazards/productivity predictive mapping.
- > **Southern West Virginia:** Investigation and reserve delineation of extensive reserves including a detailed study of geological factors influencing seam mineability.
- > **Southwestern Virginia:** Evaluation, including computer application to define potential large-scale multiple seam stripping operations. Involved in the development of specialized computerized mapping to generate multiple strip ratio reserve scenario.
- > **Eastern Kentucky:** Investigation and reserve delineation of surface and underground reserves, including computer modeling reserves and mineability parameters.
- > **Western Maryland:** Supervised exploration and evaluation program of substantial underground and surface mineable reserves.
- > **Eastern Kentucky:** Coordinated computerized database management of active oil and gas leaseholds.
- > **Eastern Kentucky:** Geological mapping of oil and gas reserves.
- > **Northern West Virginia:** Evaluation of coalbed methane reserve potential from both longwall degas wells and gob areas.
- > **Tennessee:** Evaluation of seam mineability and reserve characteristics. Implementation of an exploration program to confirm seam mapping.
- > **Utah:** Evaluated reserve for potential acquisition. Report included map projection of mining conditions controlled by geological parameters.

Publications

- > "The Future of Coal – A USA Perspective," presented to 2008 World Mining Congress, Krakow, Poland, September 2008.
- > "China Coal Overview and Summary of AACI Project," presented to West Virginia Coal Mining Institute, Stonewall Jackson Resort, West Virginia, May 2006.
- > "Digital Processing and Presentation of Complex Geological Data and Industry Trends," Keynote Speaker 2005 American Institute of Professional Geologists Annual Meeting, Lexington, Kentucky, October 2005.
- > "Energy Venture in China," presented to the Virginia Economic Development Seminar, Virginia Beach, Virginia, September 2002.



***Publications
(Continued)***

- > "Energy Venture in China," presented to the Virginia Chamber of Commerce, Williamsburg, Virginia, October 2001.
- > "CBM Review: China's Coalbed Methane Reserves," March 2002, World Coal, co-authors J.C. Tien and Marshall S. Miller.
- > "Due Diligence: Reserve Assessment and Engineering Considerations," March 1999, St. Petersburg, Florida, presented at the Financial Times Energy/Coal Outlook Conference, co-authors Marshall S. Miller and John E. Feddock.
- > "Case Study Evaluation of Geological Influences Impacting Mining Conditions at a West Virginia Longwall Mine," 1999 Geological Society of America and International Journal of Coal Geology, co-author Marshall S. Miller.
- > "Modern Geological Applications and Predictive Techniques Applied to Coal Mining," June 1998, Abingdon, Virginia, presented at the spring meeting of the Central Appalachian Section of SME.
- > "Evaluation of Geological Influences Impacting Longwall Mining," April 1998, presented at the spring meeting of the Geological Society of America, Charleston, West Virginia.
- > "Geological and Geotechnical Methods for Evaluation of Longwall Mining Conditions," West Virginia Coal Mining Institute, May 1989, Morgantown, West Virginia, co-authors: J. Scott Nelson, Claudio Faria Santos.