

Using Geospatial techniques to develop best management practices and produced water beneficial use options relative to the development of coal bed methane

Jason Patton¹, ALL Consulting, 1305 E. 15th Street, Suite 205, Tulsa, Oklahoma 74120
Phone: 918=382-7581 ext. 18; Email: darthur@all-llc.com; Web Site: <http://www.all-llc.com>

Jim Halvorson², Montana Board of Oil & Gas Conservation 2535 St. Johns Avenue, Billings, Montana
Phone: 406-656-0040; Email: jhalvorson@state.mt.us; Web Site: <http://www.bogc.dnrc.state.mt.us>

J. Daniel Arthur, P.E.³, ALL Consulting, 1305 E. 15th Street, Suite 205, Tulsa, Oklahoma 74120
Phone: 918=382-7581 ext. 14; Email: darthur@all-llc.com; Web Site: <http://www.all-llc.com>

Biographical Sketch of Author

Mr. Jason Patton earned a Bachelor of Science Degree in Geology from Arkansas Tech University and a Master of Science Degree in Geography from Murray State University. Mr. Patton currently serves as the GIS Services Manager for ALL. Mr. Patton is now the GIS Services Manager in ALL Consulting's Tulsa, Oklahoma office. He has served as the GIS technical lead on a variety of natural resource assessment, resource management, permitting, and water quality-related projects. Mr. Patton has extensive experience through all phases of GIS development including concept development, planning, design, data creation and acquisition, GIS database development, integration of historical data, and spatial analysis. Many of the projects that Mr. Patton is involved in are at the federal level, with clients including the Department of Energy (DOE), Bureau of Land Management (BLM), U.S. Army Corps of Engineers (USACE), and the United States Geological Survey (USGS).

Jim Halvorson received his B.S. and M.S. degrees in geological engineering from the Montana College of Mineral Science and Technology, Butte, Montana. In 1982 he joined Gulf Oil Corporation and worked in various exploration and development assignments with both Gulf and Chevron. Since 1990 he has served as Petroleum Geologist for the Montana Board of Oil and Gas Conservation in Billings, Montana.

Dan Arthur is a founding member and the Managing Partner of ALL Consulting (www.all-llc.com). Mr. Arthur earned his bachelors degree in Petroleum Engineering from the University of Missouri-Rolla. He is a recognized authority on environmental issues pertaining to coal bed methane development and production. Currently he serves as the lead researcher on several significant projects involving coal bed methane. Mr. Arthur has published many articles and reports and has made numerous presentations on environmental, energy, and technology issues.

Abstract

During the second half of the 1990's, Coalbed Methane (CBM) production increased dramatically nationwide to represent a significant new source of income and natural gas for many independent and established producers. Matching these soaring production rates during this period were the advancements in Geographical Information Systems (GIS) technologies generating terra-bytes of new data for the oil & gas industry. Coupled to these accelerating initiatives are many environmental concerns relating to production wastes and water table depletion of fresh water resources. It is these concerns that have prompted the conceptualization of this project for the development of Best Management Practices (BMP) and mitigation strategies utilizing GIS technologies for efficient environmental protection in conjunction with effective production of CBM. This has been accomplished by developing a framework to take advantage of a combination of investigative field research joined with leading edge GIS technologies for the creation of environmentally characterized regions of study. This paper will provide a summary of CBM BMPs as well as the use of an Internet-Based GIS application for geospatial analysis relative to CBM development and evaluation of various mitigation techniques and best management practices.