

Water Chemistry of Coalbed Methane Reservoirs

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Abstract

Gas resources such as coalbed methane (CBM) are becoming more important in Alberta as conventional natural gas supplies in the Western Canada Sedimentary Basin decline. With this in mind, the Alberta Geological Survey initiated a sampling program to collect water samples from CBM-producing wells and adjacent water wells. The goal was to enable: 1) the development of a better understanding of coalbed methane generation and its resource potential in Alberta; 2) the development of potentially new exploration strategies based on water chemistry and geomicrobiology; 3) the assessment of the connection between gas-producing and domestic or agricultural water use zones of coalbeds; 4) the development of water handling and disposal strategies consistent with the goals of regulators, stakeholders and developers; and 5) the compilation of baseline datasets useful in assessing potential changes in water resources.

Results of the analyses indicate that: 1) certain potentially naturally occurring elements and compounds exceed established environmental water quality guidelines; 2) a complex geochemical system exists within these potential CBM-bearing units, where both inorganic and biological processes are affecting water and gas chemistry; 3) groundwater ages of the sampled waters indicate that a wide range of ages could be present, and that some rock-units could have been recharged relatively recently; and 4) microbiological communities exist within these rock units that may be responsible for the generation of methane.

The information obtained through this study should help meet the goals set out for the project and hopefully assist in the responsible and informed development of the resource.