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## **Managing Coal Bed Methane Produced Waters to Minimize Present Costs and Environmental Liabilities**

Coal Bed Methane (CBM) often involves producing 1000 bbls of water per day per well or more. Water management costs must be kept low or the project could be affected. Water handling must also be environmentally protective or the operator could face regulatory action or significant future liabilities. And CBM waters vary widely in quality. Water management needs to be evaluated from four points of view -- beneficial use, impacts to water resources, pre-release treatment, and regulatory burden.

Beneficial uses account for some CBM produced water. Depending upon water quality, these include drinking water, livestock watering, irrigation, and industrial uses. Local residents and nearby industries may need water and may even defray transportation costs but the CBM operator could be liable for environmental impacts.

Surface management of CBM water can result in impacts to groundwater and surface water resources in the producing area. Discharge to permanent streams is a low cost option but it can change water quality or cause changes to the sensitive riparian environment. In addition, water discharged to the surface can make its way into groundwater aquifers.

Pre-release treatments can include aeration, artificial wetland filtration, and reverse osmosis. Treatment costs vary widely and possible hidden costs of treatment residues must be considered.

Regulatory requirements may prevent some water management options. State agency approval may be needed but federal agency approval through the National Environmental Policy Act (NEPA) may also be required. Approval may hinge upon chemical-physical criteria and environmental justice issues as well.