



GROUNDWATER PROTECTION AND COALBED METHANE DEVELOPMENT

Alberta

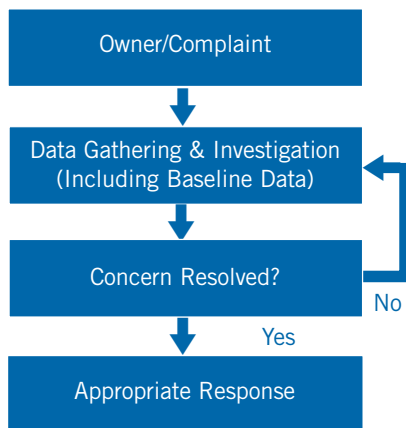
PROTECTING GROUNDWATER RESOURCES

legislation and addressing concerns

- Alberta Environment, the Energy and Utilities Board, Regional Health Authorities along with other government departments and agencies have legislation and policies to protect groundwater and human health.
- Coalbed methane companies must get Alberta Environment approval to de-water any coal bed zone if it is above the base of groundwater protection. To receive approval, companies must demonstrate no impact to other water users.
- Coalbed methane wells must be constructed and operated to protect the aquifers, domestic water supplies and prevent mixing between groundwater zones of different water quality.

Responding to Concerns

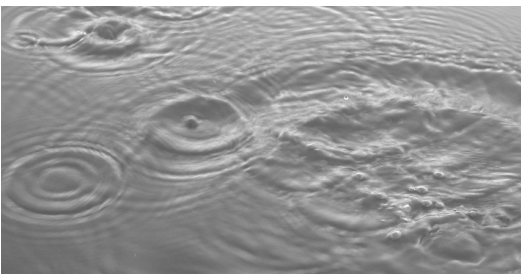
- Alberta Environment responds to all public concerns placed through our 24-hour environmental hotline: **1-800-222-6514**.
- Alberta Environment may also work with other departments and agencies to resolve water-well complaints.



alberta's water for life strategy

- *Water for Life: Alberta's Strategy for Sustainability* is the Government of Alberta's water management approach that addresses our province's water issues. The Alberta government is committed to the three water strategy goals of:
 - > Safe, secure drinking water supply
 - > Healthy aquatic ecosystems
 - > Reliable water supplies for a sustainable economy
- A key action under the water strategy is to increase our understanding of the quality and quantity of Alberta's groundwater in order to meet our human needs and support a growing economy.
- The *Water for Life* strategy is the Alberta government's framework for all water issues, including those water issues related to conventional oil and gas and coalbed methane development.

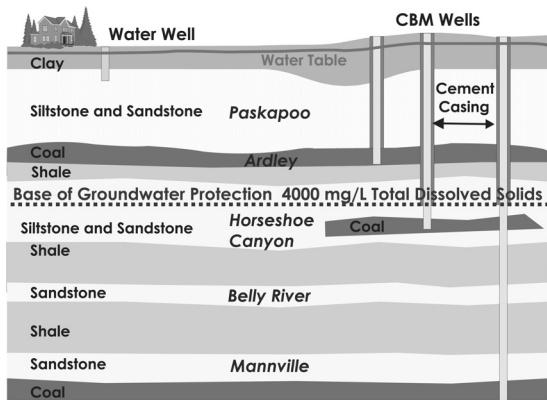
water for life



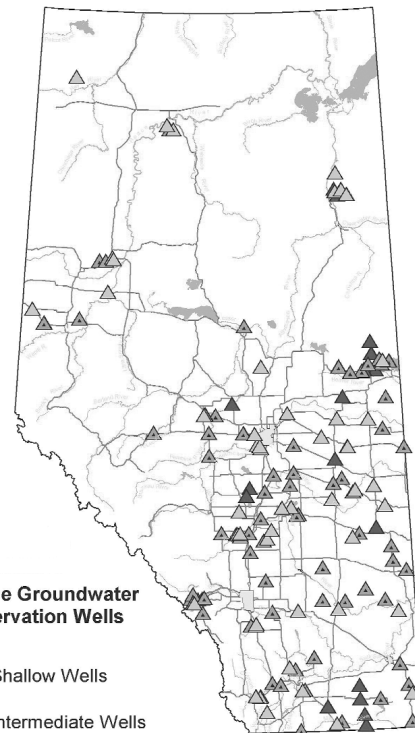
PROTECTING GROUNDWATER RESOURCES (continued)

groundwater mapping and monitoring

- Groundwater is water below the surface that fills and slowly moves through the openings and pore spaces in soil and rock layers. Aquifers are water-bearing layers that yield useable amounts of water.



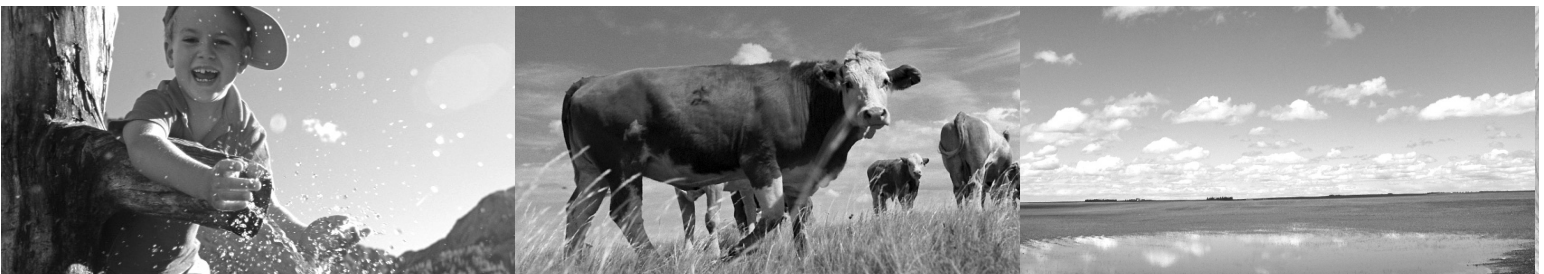
> Approximately 90% of rural water supply comes from groundwater sources.



Active Groundwater Observation Wells

- ▲ Shallow Wells
- ▲ Intermediate Wells
- ▲ Deep Wells

- Alberta Environment protects all water that is above the base of groundwater protection (fresh water). The fresh water mapping is complete for most of our province.
- Alberta Environment has one of the most comprehensive groundwater monitoring network in Canada with over 200 monitoring sites, and plans for immediate expansion.



PROTECTING GROUNDWATER RESOURCES (continued)

landowner well maintenance

- Aquifer quality and quantity is dependent upon the awareness and practices of all water users including industry and private water well owners.
- Landowners are encouraged to co-operate when contacted by a coalbed methane company regarding water well testing. Water protection is a shared responsibility.
- Well owners are responsible for ensuring their water quality is safe, and should have a routine chemical and bacteriological analysis completed regularly.
- For general information on wells and their maintenance, call 1-800-292-5697 for a free copy of *Water Wells That Last For Generations* or visit www.environment.gov.ab.ca



- To drill new water wells and protect aquifers, landowners must follow water well drilling regulations and hire certified water well drillers.

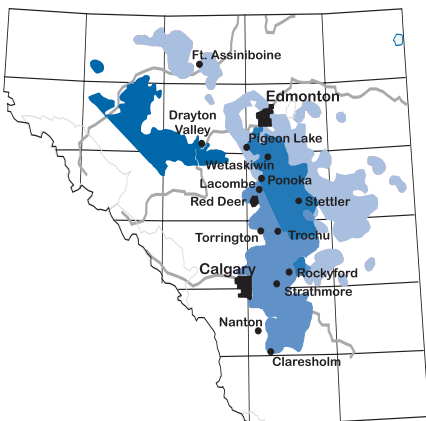
notes



COALBED METHANE DEVELOPMENT

explanation of coalbed methane

- Coalbed methane refers to methane, the main component of natural gas, which comes from coal deposits. It is formed through a natural process that converts organic matter into coal over thousands of years. Pressure from overlying rock keeps the methane attached or 'adsorbed' to the coal.
- Coalbed methane is considered unconventional natural gas since it is attached to the coal in coal seams instead of being contained in the normal porous and permeable rock formations that host conventional natural gas.
- Naturally occurring methane has been found in water wells prior to coalbed methane development in Alberta.
- As of March 2006, the Energy and Utilities Board indicates there are more than 6,000 CBM wells drilled so far in Alberta.



Currently Prospective Areas for CBM Development

- Ardley Coal Zone
- Drumheller/Horseshoe Canyon Coal Zone
- Mannville Coal Zone

baseline water-well testing

- The government's new standard ensures well water quality and quantity is accurately and consistently measured before any shallow drilling for coalbed methane.
- The testing applies to shallow coalbed methane wells, with perforations above the base of groundwater protection.
- Effective May 1, 2006, the Alberta Energy and Utilities Board requires all coalbed methane companies to offer and conduct baseline testing prior to drilling or re-completing CBM wells that involve fresh water.
- Baseline testing gathers information on the water well's:
 - > production capability
 - > water quality, including bacteria
 - > presence or absence of gas, including methane.
- The testing supports the Alberta government's *Water For Life* strategy by improving our knowledge of the province's water resources and ensuring safe, secure drinking water.
- Baseline testing results also provide information to assist an investigation should complaints occur.



