Methane

Residents of both the coal and natural gas producing regions of Wyoming need to be aware of the potential dangers from the accumulation of microbial gas, coal bed methane, or natural gas, in their water wells. High concentrations of methane in water wells, water well enclosures and other confined spaces could cause an explosion.

What Is Methane?

Methane (CH_4) is a naturally occurring hydrocarbon gas found underground. It is present in shallow and deep coal beds as well as other rock units, and is the main hydrocarbon found in natural gas, or coal bed gas. Methane can occur dissolved in the groundwater or as a gas in the soil and rock zones below the surface.

Methane migrates from areas of high pressure to areas of low pressure. Mining and well drilling operations can affect the pressure in the subsurface and cause the migration of methane to areas of lower pressure such as shallow aquifers, and water wells used as water supplies. Gas migration in the subsurface can also be influenced by an increase or decrease in the water level of an aquifer.

Active water well pumping, cessation of irrigation or underground mining operations can lower groundwater levels, reducing pressure in aquifers occurring above and adjacent to the area of coal extraction. This reduction in pressure can allow gases within the overlying rock layers to migrate into nearby water wells. Methane can also be released from abandoned deep mines, and from abandoned gas wells that are prone to leakage. These releases can also migrate into nearby water wells.

Methane can migrate into water wells in a gaseous phase or dissolved in the ground water. At atmospheric pressure, methane is soluble in water between 26-32 mg/I. It is sometimes recognizable as effervescent gas bubbles in water drawn from a faucet. In some cases, the release of methane in a water well may be recognized by a sound similar to that of boiling water. However, methane is a colorless and odorless gas, and may accumulate undetected in water well bores and water well enclosures that are not properly vented. Methane may also move into basements of homes and other structures through plumbing and piping containing electrical connections. These conditions could lead to an explosion.

What Can You Do?
Methane is lighter than air with a specific gravity of 0.555. As such, methane will not accumulate in the water well bore if the water well is properly vented to the atmosphere. Venting is an inexpensive and effective way to prevent methane accumulation in water wells, water well enclosures and other confined spaces, such as basements. Proper venting eliminates the potential for methane gas to seep into homes or structures from water wells.

Recommended Venting Procedures
Proper design is extremely important. Water well vents should be installed by a qualified water well driller or plumber.
The vent should extend above any possible flood level, potential ignition sources, and areas of exposure (above the roof line for water wells adjacent to buildings), and should have watertight connections to prevent surface water from entering. The well vent should be at least one (1) inch diameter or larger to facilitate gas flow. The end of the vent pipe should have a down-turned