

Coal Seam Methane Gas

Fact Sheet NSW

What is Coal Seam Gas?

Often referred to as Unconventional Gas, CSM (Coal Seam Methane) or CBM (Coal Bed Methane) and not to be confused with Natural Gas, it is methane gas found in coal seams. The coal seam normally acts as a water aquifer. The methane gas is trapped in the coal by the water. Methane gas has no smell, it will asphyxiate and is highly explosive, which is why coal miners are fearful of it. Methane gas is a greenhouse gas more than 20 times worse than CO₂. When burnt, methane produces 40% less greenhouse gas than coal, however the process of removing it from the coal seam sees a large amount of fugitive methane escaping into the atmosphere, so any perceived benefit is nullified.

How is Methane Gas extracted from a Coal Seam?

A mining company will first apply and pay to the State Government for a Petroleum Exploration Licence issued under the NSW Onshore Petroleum Act, they will then conduct geological studies to determine which areas offer potential for coal seam methane extraction. They will then seek to identify land where they can get permission from the owner to drill. The company will apply for a permit and drill exploratory holes to take core geological samples.

The next stage is to drill test wells into the coal seam. The initial wells drilled are unlikely to produce sufficient gas until the coal seam has been fracture stimulated (fracking). It is necessary to create fractures in the coal seam and create pathways through which the methane can flow. This fracturing is usually achieved by pumping a fracturing fluid into the coal seam at pressures sufficient to crack open the rock. When the pressure is high enough, the coal seam will fracture in one direction (wherever the seam is structurally the weakest), enabling the gas to more easily flow to the well. Fracturing fluids are primarily water-based, but they contain many other chemicals, which may include acids, benzene, toluene, ethylbenzene, xylenes and hydrocarbons. Mining companies are very reluctant to reveal what they use in the fracking process. Fracturing may also be carried out using an inert gas, such as nitrogen or CO₂, or foams, which use both water and the inert gases together with a foaming agent. Sand is often added to the fluid as a propping agent. The sand particles penetrate into the seam and become wedged in place, keeping the induced hydraulic fracture propped open, so the gas may flow more easily through the spaces between the particles to the well bore.

The next stage in the development of a CSM well is to pump out all the water from the coal seam. This “produced” water is toxic, being extremely saline and containing a very broad range of carcinogens, heavy metals and radionuclides as well as man-made chemicals used in the drilling and fracking processes. The water produced from the well has to be transported from the site by road tanker for proper disposal. The volume of water produced is normally greatest at first then, with pumping, it will gradually decline and the volume of gas will increase. CSM wells may produce from 5 to 100 cubic metres of water a day for several months or more. It is difficult to predict the volume of water that a well will produce without proper testing. After the water has been removed and the gas begins to flow, the test well will be left to run for several months during which time the methane is flared at the well head. During this time the mining company will be testing the flow rate and quality of gas produced.

The next stage is to apply for a Petroleum Production Lease (PPL). Compared to Natural Gas, which exists in a high pressure environment, CSM is under low pressure; this means that the

Coal Seam Methane Gas Fact Sheet NSW

mining company has to plan for a high density of wellheads in order for the CSM mine to be economically viable. The mining company will plan for the drilling of multiple wells and the installation of associated equipment at each well head, interconnecting pipelines and compressor stations. This will entail the same process as described for the test wells, being repeated for as many wells as deemed necessary by the mining company. In time, as the gas mine is depleted so the miner will drill more wells to ensure maximum extraction of the resource.

How could this affect me?

In a number of ways. You will discover that your legal rights are very limited, that the fossil fuel industry is determined to extract as much of the resource as there is under the ground and that our governments actively encourage the industry giving no regard for community welfare nor the health of the environment.

Property rights - Always say NO. If you allow a mining company access to your property then you are opening your door to a sequence of events that you could regret for the rest of your life. Make sure you and your neighbours act with one voice. The industry will charm you and try to minimise their activities with weasel words, twisted logic and downright lies. A typical line of theirs is “We have no plan to” just remember that plans always change. If they approach you make sure you record every moment, preferably with a video camera and try to have a witness. Remember, tell them to go away and they must go. The situation changes once they are in production because they then have a legal right to enter your property with or without your permission, but they must first go through the exploration phase and that is when you still retain a right to say NO. Gas mines make lots of noise, involve lots of infrastructure, are a serious health and safety hazard and will seriously devalue your property if in the same vicinity.

Noise and infrastructure - Lots of heavy machinery is needed to drill gas wells. The cost of hiring drilling rigs makes it necessary for them to operate 24/7 where they can. Lots of trucks will come and go carrying equipment, delivering supplies and carting away toxic water. Pumps will operate. A large cement pad will be laid and a security fence installed at each well head. Lights will be on continuously. Pipelines will be laid down connecting each well head to a main gas pipeline which will flow to compressor stations. A compressor station is very large and noisy; apart from maintaining pressure in the gas pipeline it also separates out unwanted hydrocarbons from the gas which are then vented into the atmosphere. Many hydro-carbons cause cancer.

Your health and safety - There are many hazards involved with CSM extraction. The water taken from the coal seam is toxic and must be handled with extreme care. After the water has been removed from the coal seam, the dynamics of the coal seam have been changed causing the methane to be freed up and migrate; the hope is that all the methane will find its way up to the well head, however rocks can and do have fault lines by which the methane can find alternate avenues to the surface. There are many instances of methane coming out of peoples taps. CSM wells and pipelines are fire hazards; over 50% of wells tested in Queensland leak methane. CSM wells do sometimes catch fire and explode. Once the methane has been freed up from the coal, nothing will stop it flowing.

Water tables - CSM mining poses a serious risk to fresh water aquifers. The huge volumes extracted from the coal seam can then lead to a major depletion of connected aquifers which would be used for drinking water, agriculture and fire fighting. The large assortment of

Coal Seam Methane Gas Fact Sheet NSW

chemicals used for drilling and fracking cause serious contamination to fresh water aquifers and running groundwater streams and rivers.

Environment - The pollution of water tables and rivers leads to the mass death of all types of living creatures and plants. The installation of full scale industrial machinery scares away wildlife. The uncontrolled venting of fugitive methane emissions poisons the atmosphere.

How am I protected?

There are very few laws that have any affect on the CSM industry in NSW. The principle legislation is the NSW Petroleum (Onshore) Act 1991, which does not even mention coal seam methane gas. Environmental regulation is minimal and government generally relies on information supplied by the industry. There is no independent review of the potential impacts of developing a CSM mine on community, health and environment. Local council has no power in the process. Communities are kept in the dark and complaints are swept aside; there is no independent mechanism for dealing with community concerns. Communities have to form their own action groups, quickly learn as much as they can then bring together the expertise and money required to combat the world's largest industry which has dispro-portionate influence over our governments. When you see that Exploration Licences cover most of NSW, you then understand that this will affect everyone unless we stop, think, demand change and restore balance.

Where can I find help?

Communities around Australia are similarly affected and have been gathering information about the fossil fuel industry, working out ways to combat the destruction of their country and their health. It is too hard to do on your own. So these communities have now formed the **Lock The Gate Alliance**. The Alliance presents force through numbers, focusing on the key issues that impact us all **Bad Law Bad Government Bad Attitude** sharing information, supporting each other, making our politicians understand the problem and mobilising broad community support through education and media, we will bring about the change necessary to save Australia from this devastation.

Visit www.lockthegate.org.au and join the **Lock The Gate Alliance**