

Coal seam gas mining in Australia

Coal seam gas has rapidly become a major industry in Australia during the last decade. The multi-billion dollar industry has also become a controversial and divisive one between property owners and mining companies. It is still unclear whether the impact of the coal seam gas mining industry on the environment is as serious as some critics predict. However, established environmental impacts from coal seam gas mining are an ongoing issue, and can be minimised and/or managed through environmental research.

What is coal seam gas, and how is it beneficial?

Coal seam gas (CSG) is a form of natural gas (predominantly consisting of methane) which is extracted from underground coal beds. Australia has large reserves of CSG in its eastern and north-eastern states, and this resource is utilised to provide a large percentage of national gas needs. CSG is considered beneficial as it provides an alternative to traditional energy sources.

How coal seam gas is mined

Gas extraction well networks are installed with rigs that pass through aquifers to reach coal seams. A mixture of water and chemicals is forced into the seam to crack it open; this process is called fracturing or 'fracking'. During the extraction of the gas, the water/chemical mix is also brought back to the surface. This water, also called formation water, has a high level of salinity due to chemicals added to extract the gas. The extracted gas is later chilled and becomes liquefied natural gas (LNG) for use in electricity production.

Environmental implications of coal seam gas mining

Although CSG mining can appear relatively minimal in its environmental impact, several aspects of the mining process have the potential to create environmentally harmful outcomes. The removal of water during CSG extraction also lowers the natural water table at the mining site, which can affect not only the local property owners, but also communities in the surrounding areas. While saline water can be treated, the water in brine ponds that result after desalination still needs to be judiciously disposed of. In addition, the formation water also contains several heavy metals and organic and inorganic contaminants, which are toxic to aquatic and terrestrial organisms.

Another serious environmental issue caused by CSG mining is the potential for methane leakages during the mining and storage processes. Methane that is burnt (when used as a fuel) produces about 40% less greenhouse gas than burnt coal, but the impact of any unburnt (leaked) methane on the atmosphere is 20 times that of carbon dioxide – adding significantly to greenhouse pollution.

How environmental consequences can be managed

CRC CARE technologies can remediate and manage sites affected by a range of environmental issues including heavy metal and hydrocarbon contamination, water salinity, or problematic soils such as salt-affected or acid sulfate soils.

CRC CARE works with leading international researchers, environmental practitioners and regulators to develop cost-effective and legally acceptable solutions to environmental issues, and also puts emphasis on community engagement regarding contamination remediation and management issues.

Many communities and community groups are extremely sensitive about potentially being affected by environmental issues caused by CSG mining, and CRC CARE is able to address those concerns. Due to the independent nature of CRC CARE and its international reputation, the solutions provided by CRC CARE are likely to gain wider acceptance by all stakeholders.