

WATER AND COAL SEAM GAS | FACT SHEET 4

Managing coal seam gas produced water

April 2013

What is produced water?

Pumping groundwater from a coal seam reduces the pressure that keeps the coal seam gas (CSG) in place. This allows the gas and produced groundwater to flow into the CSG well and up to the surface.

On the small number of occasions when the process of hydraulic fracturing is used (5-10%) this involves the injection of water, sand and additives under pressure to help the movement of water and gas through the coal. After hydraulic fracturing is complete, the injected fluid (minus the sand) is pumped back to the surface via the CSG well. This fluid is stored, handled and disposed of separately from the ongoing produced water.

Both types of water recovered from a CSG production well are termed 'produced water'.

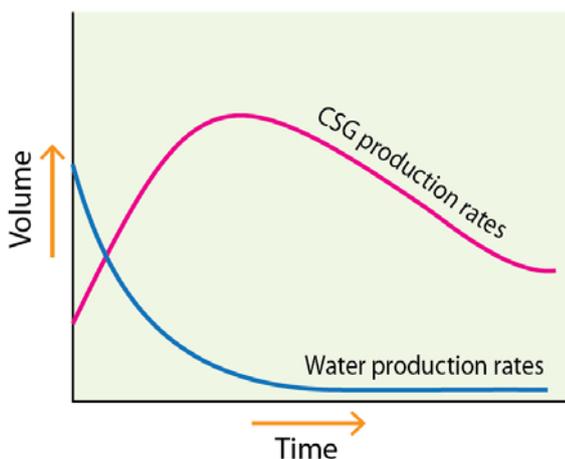
How much water is produced during CSG production?

The amount of water produced by a CSG well is highly variable and depends on the permeability of the coal and surrounding geologic formations. The yield of gas (and water) can be increased by drilling several horizontal wells from the vertical well into the coal seam, or by artificially enhancing the permeability of the coal through hydraulic fracturing.

CSG extraction from the Sydney Basin at Camden produces a maximum of 30 megalitres (ML) of water per year from all gas wells and in 2012 produced only 4.8 ML in total, while in the Surat Basin in Queensland production is around 7 to 300 ML of water per year for each gas well. To put these volumes in perspective, an Olympic swimming pool contains about 2.5 ML of water.

Initially the production of water from a CSG well is higher (volume measured in megalitres), but over time (measured in months to years) this declines as the volume of produced gas increases.

Figure 1 - Schematic production profile for a typical CSG well



What is the quality of produced water?

The quality of CSG produced water, like all groundwater, can be highly variable depending on the age and depth of the water and the geological nature of the host rocks. In many instances the water is brackish (3000 to 7000 mg/L) and may contain traces of other naturally occurring substances associated with coal.

If hydraulic fracturing has been conducted, the early produced water will contain the fracking fluid used in the well. This fluid must be handled carefully and disposed of appropriately in accordance with the [NSW Code of Practice for Coal Seam Gas Fracture Stimulation](#).

The long term pumping of a gas well that has been fracked ensures that any remaining fracking fluid is pulled into the well and can not migrate into surrounding geological formations.

The use of BTEX chemicals in fracking fluids was banned by the NSW Government in 2011.

How is the water managed?

The reuse, recycling or disposal of CSG produced water is managed by an approval issued under the *Petroleum (Onshore) Act 1991* by the Division of Resources and Energy in NSW Trade & Investment.

As part of this approval process, CSG activities are assessed under the *Environmental Planning and Assessment Act 1979*. CSG activities classed as State Significant Development also require approval under the *Environmental Planning and Assessment Act 1979*.

The reuse, recycling or disposal of returned fracking fluids is required to be done in accordance with a fracture stimulation management plan approved under the *Petroleum (Onshore) Act 1991* by the Division of Resources and Energy in NSW Trade & Investment.

The use of evaporation basins for the disposal of CSG produced water has been prohibited by the NSW Government.

Approved methods for disposal of CSG produced water may include beneficial reuse (for example for dust suppression at a coal mine), reinjection into an aquifer or treatment (for example by reverse osmosis), and reuse.

Who monitors the produced water?

The NSW Aquifer Interference Policy sets out minimal impact considerations for assessing the impacts of aquifer interference activities on water resources, and this includes the disposal of CSG produced water.

Under the *Protection of the Environment Operations Act 1997*, any premises that have the capacity to produce more than five petajoules of gas per annum must hold a licence. These licences are administered by the NSW Environment Protection Authority (EPA). The licence may include conditions relating to waste management and water quality.

More information

www.water.nsw.gov.au

www.resources.nsw.gov.au

www.environment.nsw.gov.au

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