



Optimising wastewater management for onshore gas in the Northern Territory

This project will develop a water management framework that identifies sustainable options for managing onshore gas wastewater in the Northern Territory should gas resource development proposals proceed.

Water management is one of the main concerns expressed by communities about impacts of potential shale gas development in the Northern Territory.

The Northern Territory Government prohibits wastewater produced as a result of gas resource production to be re-injected into aquifers or discharge to surface waterways. Therefore, more sustainable options for treatment, reuse, or disposal of wastewater must be explored.

This project involves consultation with industry and government to incorporate a range of key social, environmental and economic assessment criteria into a wastewater management framework.

The framework will guide industry and regulators in making optimal wastewater management decisions, benefitting local communities, broader society and the environment.

Beetaloo Sub-basin

The Beetaloo Sub-basin is situated southeast of Katherine in the Northern Territory and spans approximately 30,000 square kilometres. One of the most promising areas for shale gas production in Australia, it contains an estimated gas resource of 178,200 petajoules (PJ).

The project will develop and demonstrate the applicability of the holistic water management framework by conducting two site-specific case studies in the Beetaloo Sub-basin.

Addressing community concerns

The Scientific Inquiry into Hydraulic Fracturing in the Northern Territory found that shale gas production remains controversial in the Northern Territory due to concerns over impacts associated with the storage, transport and disposal of water and fluids that return to the surface during hydraulic fracturing.

Optimal planning and management of Northern Territory shale gas water based on agreed objectives will decrease potential management challenges and environmental impacts, and will help alleviate community concerns.

KEY POINTS

- This work directly addresses Recommendation 5.5 of the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory, which states: “Government should develop a wastewater management framework for any onshore shale gas industry”.
- The project will develop an options framework and decision criteria for water and wastewater management that explores options to protect the environment while remaining cost effective.
- The project will engage with industry, government and community stakeholders throughout – inviting a regular ‘stop and review’ function to identify and resolve issues before moving to the next stage.

MORE INFORMATION

- More about [the project](#)
- Scientific inquiry [final report](#)
- About the [Beetaloo Sub-basin](#)



Water is a precious resource in the Beetaloo Sub-basin.

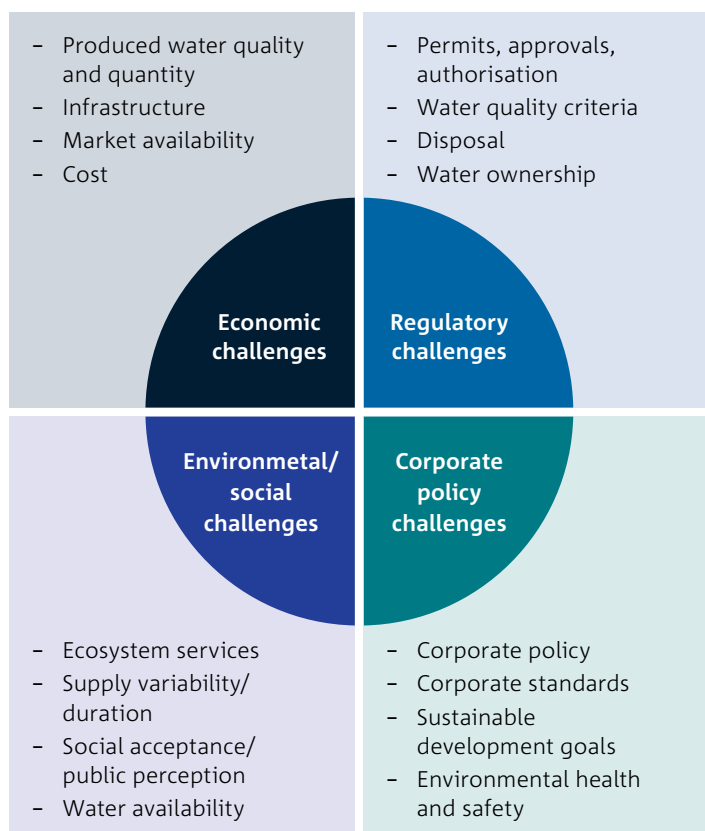
Challenges in shale gas water management

Wastewater produced from petroleum wells includes flowback fluid (hydraulic fracturing fluid that has been injected into the well and then returned to the surface), and produced water (formation water that is released during the fracture stimulation at depth and returns to the surface through the gas extraction process).

Flowback water contains chemical additives from the hydraulic fracturing fluid as well geogenic chemical that occur naturally in the shale formations. This water can be very saline, and may include traces of barium, strontium and bromine, low concentrations of heavy metals, organic matter, and naturally occurring radioactive materials.

In other countries, flowback water is often reinjected at depth as a disposal method. In the Northern Territory, this method is prohibited, along with discharge of wastewaters to surface waters. Therefore, more sustainable options for treatment, reuse, or disposal of the water must be explored.

Produced water reflects the chemistry of target formations. The chemical composition of produced water from shale gas wells is likely to require higher levels of water treatment.



Challenges for reuse of produced water. Credit: www.ipieca.org.

Developing a framework specific to the Northern Territory

The exact quantities and qualities of flowback water and produced water likely to be generated for shale gas development in the Northern Territory are dependent on local geologies and methods employed in extraction.

This project will identify the water quantities and qualities likely at each stage of the production process. Once the wastewaters have been characterised, it will be possible to identify approaches to guide industry and regulators to optimise the most appropriate options for re-use, recycling, treatment and disposal of wastewater, based on a fit-for-purpose approach specific to the Northern Territory.

The project team will develop a framework tool that focuses on identifying and maximising beneficial use and reuse opportunities; reducing costs; and minimising the potential risk of negative environmental legacy from wastewater.

Assisting industry and regulators

This project will not seek to prescribe particular technology choices, but rather provide a range of possibilities informed by key environmental, social, and economic indicators.

No single technology is likely to provide the answer to wastewater management in the Northern Territory. More likely, a combination of pre-treatment techniques, existing use of evaporation ponds for saline waste waters and new desalination technologies will need to be optimised.

The project will develop and consider a range of criteria that will be synthesised into a final guide to allow industry and government to optimise choices of water management processes, water treatment technologies, and wastewater disposal options.

FREQUENTLY ASKED QUESTIONS

What is the timeline for the project?

August 2020 to February 2022.

When will the results be available?

A final report will be available in February 2022.

Who is funding the project?

This project is co-funded by the Australian Government and the Northern Territory Government (72%); CSIRO (25%); and by Origin Energy, Santos and Panagea (3%).

ABOUT GISERA

The Gas Industry Social and Environmental Research Alliance (GISERA) is a collaboration between CSIRO, Commonwealth and state governments and industry established to undertake publicly-reported independent research. The purpose of GISERA is to provide quality assured scientific research and information to communities living in gas development regions focusing on social and environmental topics including: groundwater and surface water, biodiversity, land management, the marine environment, and socio-economic impacts. The governance structure for GISERA is designed to provide for and protect research independence and transparency of research. Visit gisera.csiro.au for more information about GISERA's governance structure, projects and research findings.

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