



Australia's National
Science Agency

ONSHORE GAS RESEARCH IN THE NORTHERN TERRITORY

GISERA | Gas Industry Social and Environmental Research Alliance

Investigating the environmental, social and economic impacts of onshore gas development in the Northern Territory

CSIRO is conducting a multi-year research program in the Northern Territory to better understand the environmental, social and economic impacts of unconventional gas development in the Beetaloo Sub-basin.

In September 2018, CSIRO's Gas Industry Social and Environmental Research Alliance (GISERA), partnered with the Northern Territory Government to deliver independent and transparent advice on gas development. To date, GISERA has undertaken a total of 21 projects, of which 16 are now complete.

The Beetaloo Sub-basin lies south-east of Katherine in the NT and spans an area of about 30,000 square kilometres.

The estimated gas resources for the Beetaloo Sub-basin are of similar size to other major gas producing basins in Australia, such as the Surat Basin in Queensland and the Bonaparte/Browse basins in Western Australia.

To help identify Northern Territory research priorities, GISERA's NT Research Advisory Committee (NT RAC) reviews and approves research proposals on a range of science questions to which the community, government and local industry seek answers.

NT RAC membership comprises of 57 per cent community, 29 per cent industry and 14 per cent government stakeholders.

What is CSIRO's GISERA?

GISERA is a national collaboration between CSIRO, State and Territory Governments, and industry. CSIRO established GISERA in 2011 to undertake publicly-reported independent research into onshore gas regions, to better inform communities, industry, governments and policy makers. GISERA aims to ensure research conducted by CSIRO is informed by, and of benefit to, the broader community and industry.

Is it independent?

CSIRO has built its reputation on providing impartial, integrated research to industry, regulators and the wider community. GISERA's governance model is central to ensuring independence and transparency in the research undertaken by CSIRO.

How much funding has been committed to this region?

Total funding to date is over \$9.3 million, with contributions from the Australian Government (\$4.2 million), NT Government (\$1.4 million), gas industry (\$1.7 million) and CSIRO (\$2 million).

Will this research be available to the NT public?

All GISERA research is publicly available at gisera.csiro.au along with explanatory fact sheets and videos.

GISERA shares its research through local, regional and national workshops, seminars, conferences and technical briefings.



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Research projects in the Northern Territory

Subject	Project	Outcomes
Ground and surface waters	<u>Baseline monitoring of groundwater properties in the Beetaloo Sub-basin</u>	COMPLETE: Sampled and analysed groundwater to establish baseline data on geochemistry and flow.
	<u>Monitoring and microbial degradation of gas activity chemicals, NT</u>	COMPLETE: Improved understanding of how chemicals used in onshore gas development degrade in aquifers and soils.
	<u>Characterisation of stygofauna and microbial assemblages in the NT</u>	COMPLETE: Pilot program to improve knowledge of stygofauna and subterranean groundwater-dependent ecosystems.
	<u>Improved approaches to long-term monitoring of decommissioned wells</u>	COMPLETE: Investigated and assessed options for long-term monitoring of well integrity in decommissioned onshore gas wells.
	<u>Onshore gas water lifecycle management options framework</u>	COMPLETE: Developed a water management framework with a focus on identifying sustainable options for managing onshore gas wastewater.
	<u>Fate of hydraulic fracturing fluids and geogenic hydrocarbons</u>	COMPLETE: Improved understanding of chemicals and their lifecycle in flow-back water and storage facilities.
	<u>Examination of stygofauna ecosystems of the Beetaloo Sub-basin</u>	COMPLETE: Developed an understanding of the extent to which stygofauna present in bores reflect their presence more widely within aquifers.
	<u>Environmental baseline characterisation of the springs in Hot Springs Valley, NT</u>	UNDERWAY: Conduct a field campaign to collect detailed data on the geology, hydrogeology and ecology of the Hot Springs Valley to augment data collected in previous surveys.
Greenhouse gases and air quality	<u>Groundwater connectivity in the eastern extension of the Beetaloo Sub-basin</u>	UNDERWAY: Investigate potential connectivity of groundwater systems between the Cambrian Limestone Aquifer and the surface in the eastern extension of the Beetaloo Sub-basin.
	<u>Review of potential environmental impacts of shale gas related wastewater disposal options</u>	UNDERWAY: Assess wastewater management and treatment options, including associated waste disposal requirements, and their potential for environmental harm.
	<u>Baseline monitoring of methane emissions in the Beetaloo Sub-basin</u>	COMPLETE: Measured baseline methane emissions from natural and human-derived sources to understand variations across seasons.
	<u>Mitigating fugitive gas emissions from well casings</u>	COMPLETE: Reviewed and evaluated techniques and materials for minimising fugitive methane emissions.
Biodiversity	<u>Offsets for life cycle greenhouse gas emissions of onshore gas in the NT</u>	COMPLETE: Used scenario analysis to seek feasible options for offsetting GHG emissions over the lifetime of onshore gas production.
	<u>Methane emissions from well drilling to completion in the Beetaloo</u>	UNDERWAY: Use monitoring stations to quantify fugitive methane emissions from well construction and completion activities.
Agriculture	<u>Managing impacts to biodiversity from roads and pipelines in the Beetaloo</u>	COMPLETE: Investigated how roads, pipelines and other transport infrastructure from onshore gas development may impact biodiversity.
Social and economic	<u>Putting land management knowledge into practice</u>	COMPLETE: Developed high quality spatial data to help stakeholders evaluate the design and placement of gas infrastructure, protect surface water and vegetation, and reduce erosion.
	<u>Mapping future transport for improved planning and operation</u>	COMPLETE: Analysed the likely impacts of onshore gas development on regional road and rail networks.
Land and infrastructure	<u>Pathways for Indigenous socio-economic development in the Beetaloo region of the NT</u>	UNDERWAY: Explore how economic opportunities from shale gas and other projects (agriculture, renewables, etc) can support the aspirations, values, and priorities of Aboriginal communities.
	<u>Background seismicity and estimating seismic hazards in the Beetaloo Sub-basin</u>	COMPLETE: Established baseline data on current natural seismic activity which can be used to identify any future increases.
	<u>Beetaloo basin shale long-term competency after decommissioning</u>	COMPLETE: Improved our understanding of how decommissioned wells maintain their integrity over the long-term.

Further information | 1300 363 400 | gisera@csiro.au | gisera.csiro.au

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, greenhouse gas emissions, 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.