Australia's National
Science Agency

GISERA | Gas Industry Social and Environmental Research Alliance

Progress report

Beneficial reuse and disposal options for brine from the Surat and Bowen basins

Progress against project milestones

Progress against milestones/tasks are approved by the GISERA Director, acting with authority in accordance with the GISERA Alliance Agreement.

Progress against project milestones/tasks is indicated by two methods: Traffic light reports and descriptive Project schedule reports.

1. Traffic light reports in the Project Schedule Table below show progress using a simple colour code:

- **Green**:
  - Milestone fully met according to schedule.
  - Project is expected to continue to deliver according to plan.
  - Milestone payment is approved.
- **Amber**:
  - Milestone largely met according to schedule.
  - Project has experienced delays or difficulties that will be overcome by next milestone, enabling project to return to delivery according to plan by next milestone.
  - Milestone payment is withheld.
  - Milestone payment withheld for second of two successive amber lights; project review initiated and undertaken by GISERA Director.
- **Red**:
  - Milestone not met according to schedule.
  - Problems in meeting milestone are likely to impact subsequent project delivery, such that revisions to project timing, scope or budget must be considered.
  - Milestone payment is withheld.
  - Project review initiated by GISERA Director.

2. Progress Schedule Reports outline task objectives and outputs and describe, in the 'progress report' section, the means and extent to which progress towards tasks has been made.

Project schedule table

TASK NUMBER	TASK DESCRIPTION	SCHEDULED START	SCHEDULED FINISH	COMMENT
1	Review of literature and existing and emerging innovative technologies and solutions for beneficial reuse or end-use options for brine	1 Jul 2024	31 Mar 2025	Completed
2	Brine characterisation	1 Jul 2024	31 Mar 2025	Completed
3	Techno-economic analysis	1 Feb 2025	30 Sept 2025	
4	Communication and engagement with industry and key stakeholders (up to 3 workshops)	1 Jul 2024	30 Jun 2026	
5	Communication and reporting of project progress and findings	1 Jul 2024	30 Jun 2026	

Project schedule report

TASK 1: Review of literature and existing and emerging innovative technologies and solutions for beneficial reuse options for brine and collation of existing data

BACKGROUND

Task 1 will involve two components. The first a detailed review of the literature and existing and emerging approaches to beneficial reuse and end-use of brine, which could apply to the Surat and Bowen basins. This will build on the work already conducted for the NSW CSG project in Narrabri (Srivastava et al, 2024). A wide range of recent literature including publicly accessible reports and web-based resources related to CSG extraction in Surat and Bowen basins and other sites in Australia or globally will be reviewed. Scientific journals will also be reviewed to find potential options for brine reuse that may not have been previously considered. The second component is the collation and review of existing data on CSG derived brine generated and stored in Queensland. This will allow key characteristics of the brine to be determined and any data gaps to be identified.

TASK OBJECTIVES

1) Review previous work as published in reports, journals, and web-based resources;
2) Collate and review existing data on the characteristics of brine in ponds in Queensland; and
3) Use this information to inform Tasks 3, 4 and 5.

TASK OUTPUTS AND SPECIFIC DELIVERABLES:

A draft report that comprehensively reviews previous work will be prepared. This information will feed into later tasks and the results will be discussed in detail in the final report.

PROGRESS REPORT

A review of recent developments in the beneficial use and disposal options for brine in Australia and overseas has been completed. These include journal articles, industry reports, and websites.

TASK 2: Brine characterisation

BACKGROUND

Task 2 will focus on the characterisation of brine samples from different sites to address data gaps identified in Task 1. CSIRO will collect brine samples from Bowen and Surat basins and analyse them for various characteristics of brine as prescribed in the (to be) developed Sampling and Analytical Plan. To facilitate brine sampling and accessing any existing characterisation data for brine, CSIRO will liaise with the three industry partners and any other relevant stakeholders. Any data collected or sourced will be deidentified for their location and sample IDs. This task will also review the

geochemical processes that occur in brine ponds as they dehydrate, either through laboratory experiments or speciation modelling.

TASK OBJECTIVES

The objectives of the project report will be to:

1) Collect brine samples from existing reverse osmosis plants from Bowen and Surat basins
2) Collect brine samples from existing evaporation ponds from Bowen and Surat basins
3) Analyse brine samples for various parameters
4) Review geochemical processes that occur in brine ponds

TASK OUTPUTS AND SPECIFIC DELIVERABLES:

A draft report detailing the brine composition and variability across sites that will feed into the final report. This report will combine the newly-acquired data with existing data obtained in Task 1.

PROGRESS REPORT

Brine samples from different locations were analysed and characterised for various water quality parameters. In addition, data on brine composition was received from the gas companies. These data have been evaluated to comprehend the options for beneficial use and disposal of brine.

TASK 3: Techno-economic analysis

BACKGROUND

A techno-economic analysis (pros and cons) of identified technology/management interventions/options for the beneficial reuse or end-use options for brine from the Surat and Bowen basins will be conducted. This will involve an assessment of the technical merits and demerits of each identified option. In addition, the economic impact, including broad economic analysis of each option will be evaluated. The physical and chemical properties of brine and their variability will be an input into this analysis, allowing a high level assessment of how the brine characteristics may impact the performance of the reuse and disposal technologies identified.

TASK OBJECTIVES

The objectives of the project report will be to:

1) Provide an overview of the technical merits and demerits of current and emerging technologies and their sensitivities to the characteristics of the brine
2) Conduct a techno-economic assessment (pros and cons) of identified technology/management interventions/options

TASK OUTPUTS AND SPECIFIC DELIVERABLES

A draft report detailing the techno-economic assessment of identified technology/management interventions/options; that will feed into the final report.

PROGRESS REPORT

This task will be delivered in September 2025.

TASK 4: Communication and engagement with industry and key stakeholders

BACKGROUND

Up to three workshops will be organised to engage with industry and key stakeholders to elicit existing knowledge and to understand priorities in relation to produced water and brine about CSG brine. The workshops will also be used to develop and refine a sampling and analytical quality program for brine sampling and characterisation.

TASK OBJECTIVES

- The first workshop aims at engagement with selected industry and key stakeholders and discussing the project aim, scope, methods, timing and expected outcomes, and engaging with stakeholders around their perceived information and communication needs. A discussion on brine characterisation and sampling and analytical quality plan will also be held at the workshop.
- The second workshop will discuss and refine the proposed technical and economic frameworks that will be used to evaluate each of the potential beneficial reuse options for brine.
- The third engagement will communicate project outcomes and key messages.

TASK OUTPUTS AND SPECIFIC DELIVERABLES

The feedback from the workshops will be considered and incorporated into the final report. Ethics approval for seeking feedback from stakeholders will be obtained prior to engagement.

PROGRESS REPORT

This task will be delivered in June 2026.

TASK 5: Communication and reporting of project progress and findings

BACKGROUND: Communication of GISERA research is an important component of outreach and dissemination of findings to diverse audiences.

TASK OBJECTIVES: Communicate project objectives, progress and findings via factsheet(s), reports, presentations and journal article(s), in consultation with GISERA Communications officers. A knowledge transfer session will be organised with key stakeholders at the completion of the project.

TASK OUTPUTS AND SPECIFIC DELIVERABLES: Communicate project objectives, progress and results to GISERA stakeholders according to standard GISERA project procedures which may include, but not limited to:

1) Knowledge Transfer session with Government/Gas Industry.

2) Two project factsheets: A factsheet developed at the commencement of the project, and a second that will include peer-reviewed results and implications developed at the completion of the project, both to be published to the GISERA website.
3) A quarterly report.
4) A consolidated report (from tasks 1, 2, 3 and 4) outlining the scope, methods, findings and any suggestions/options for future research.
5) Following the CSIRO ePublish review, the consolidated report will be submitted to the GISERA Director for final approval.
6) Following the CSIRO ePublish review, a manuscript/abstract based on the report will be submitted to an appropriate journal/conference.

PROGRESS REPORT

This task will be delivered in June 2026.

Variations to Project Order

Changes to research Project Orders are approved by the GISERA Director, acting with authority, in accordance with the GISERA Alliance Agreement. Any variations above the GISERA Director's delegation require the approval of the relevant GISERA Research Advisory Committee.

The table below details variations to research Project Order.

Register of changes to Research Project Order

DATE	ISSUE	ACTION	AUTHORISATION
25/02/25	Delay in receiving data from industry.	Milestone 1 has been extended from December 2024 to 31 March 2025	

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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.