



Australia's National
Science Agency

GISERA | Gas Industry Social and Environmental Research Alliance

Progress report

Decision support framework for future groundwater
development scenarios in the southeast South Australia



Australian Government
Department of Industry, Science,
Energy and Resources



Supported by
Government of
South Australia



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	Stakeholder workshop	Jul-20	Sept-20	
2	WAVES modelling	Oct-20	Apr-21	
3	Integrated analysis of groundwater with water-energy-carbon balance	Apr-21	Aug-21	
4	Propagation of uncertainty through the model chain	Jun-21	Dec-21	
5	Scenario analysis and optimisation	Oct-21	Feb-22	
6	Multi Criteria Analysis	Jan-22	Jun-22	
7	Final Report, Knowledge transfer, Journal paper	Mar-22	Aug-22	

Project schedule report

TASK 1: Stakeholder workshop and scenario elicitation

BACKGROUND

A stakeholder workshop will be conducted at the start of the project with key stakeholders identified from the Government, Industry and other relevant stakeholders to discuss the overarching goals of the project and intended outcomes. The stakeholder workshop will facilitate an initial elicitation of scenarios, including climate and other developmental scenarios of future groundwater use for agriculture and other industrial purposes in the southeast including those that the stakeholders consider as potential responses to climate change

TASK OBJECTIVES

Establish the project commencement and elicit the scenarios

TASK OUTPUTS AND SPECIFIC DELIVERABLES:

List of scenarios to be modelled

PROGRESS REPORT

The stakeholder workshop was held on 6th November 2020. Stakeholders and CSIRO SA staff attended the workshop in person at Chardonnay Lodge in Penola and interstate participants joined through videoconferencing facility. A total of 15 people including stakeholders from the community, academia, Government, and relevant industries attended the workshop. Project team

presentations provided overview of the objectives and scope of the project as a research exercise that integrates biophysical scenario analysis with participatory multi-criteria analysis to provide a valuable tool that can be used for exploring and informing stakeholder perspectives for groundwater management and decision making. Stakeholder presentations provided an overview of the industry insights about groundwater management in the region. Discussions focussed on opportunities for scenarios of groundwater development and management and potential criteria that could be used for the MCA. Notes from the workshop were collated and shared with all participants. This milestone is now complete

TASK 2: Simulation of water-energy-carbon balances for future climate scenarios using WAVES model

BACKGROUND

The WAVES model (Zhang et al, 1996) will be used for the simulation of the vertical movement of water in the soil column under the influence of energy-water balance and dynamic plant growth resulting in groundwater recharge. An important advantage of the WAVES model is the ability to couple the energy-water-carbon balances. This enables the model to simulate Carbon assimilation and respiration from roots, stems and leaves using an empirical representation of the vegetation response allowing the leaf area to change dynamically with environmental conditions like soil moisture, solar radiation, and atmospheric temperature.

TASK OBJECTIVES

Simulation of water-energy-carbon balance for the southeast SA using Waves model

TASK OUTPUTS AND SPECIFIC DELIVERABLES

WAVES model outputs

PROGRESS REPORT

The WAVES modelling for the southeast was completed. The WAVES model developed can simulate the water, energy and carbon dynamics above the land surface and is a critical component for assessing the water balance for current and future climatic conditions. In the following tasks, this model will be used in conjunction with a groundwater model for investigating the land surface and groundwater balance in the southeast region. The model set up can be used for investigating changes in recharge and consumptive use and its impacts on groundwater balance. The scenarios for simulation of these water balances have been shortlisted based on the stakeholder discussions undertaken as part of the initial project workshop.

This milestone is now complete.

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

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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.