



Australia's National  
Science Agency

**GISERA** | Gas Industry Social and Environmental Research Alliance

# Progress report

Exposure assessment of identified chemicals used in the coal seam gas activities at a study site in the southern Surat Basin, Queensland.



# 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	Prescreening of ~50 chemicals for further assessment	Feb-23	Feb-23	Completed
2	Screening assessment of high-risk chemicals	Mar-23	Apr-23	Completed
3	Microbial degradation trial of screened high-risk chemicals	May-23	Feb-24	This task will be completed in March 2024.
4	Communication product	Sep-23	Mar-24	
5	Desktop exposure assessment	Sep-23	Nov-23	Completed
6	Sampling logistics	Oct-23	Mar-24	
7	Sampling campaign – exposure assessment	Nov-23	Apr-24	
8	Chemical analyses	Mar-24	Mid-May-24	
9	Project reporting	Feb-23	Jul-24	
10	Communicate findings to stakeholders	Feb-23	Jul-24	

## Project schedule report

### TASK 1: Prescreening of ~50 chemicals for further assessment

#### BACKGROUND

Prescreening of chemicals to determine potentially hazardous chemicals to take forward.

#### TASK OBJECTIVES

Critical appraisal of the H.2 chemicals list (~50) by the project team through chemical toxicity reviews, evaluation of exposure potential, evaluation of persistence and bioaccumulation in soil environments, and known CSG usage (concentration of chemical used, recent usage, widespread usage) and other industrial usage. The chemicals will be triaged, and high-risk chemicals will be identified for further investigation.

## **TASK OUTPUTS AND SPECIFIC DELIVERABLES:**

Brief technical report providing the list of high-risk chemicals to be taken forward in this project and methods of evaluation.

### **PROGRESS REPORT**

This task is complete with the two reports provided by the external contractor. Review of these reports by the project team is complete. An outcome of this review identified some additional information regarding chemical toxicity and bioaccumulation should be sort. This falls outside of the scope of this task and will be reported on in the final report.

## **TASK 2: Screening appraisal of potentially hazardous chemicals**

### **BACKGROUND**

This task will be carried out by an external contractor following the Health Study Framework and will identify any additional chemicals for further investigation.

### **TASK OBJECTIVES**

- Desktop appraisal of potentially hazardous chemicals identified from Task 1.
- This appraisal will follow the GISERA Health Study Framework.

## **TASK OUTPUTS AND SPECIFIC DELIVERABLES:**

Report providing screening appraisal of high-risk chemicals through the Health Study Framework

### **PROGRESS REPORT**

This task is complete.

The external contractor has completed and finalised the screening appraisal report. The assessment from the report found that two chemicals were estimated to pose a potential risk based on available industry information on their use, and that these two chemicals required further assessment. These two chemicals were naphthalene and Dazomet, and these chemicals will be taken forward in Task 3 for microbial degradation trials.

The external contractor has carried out an appraisal, following the Health Study Framework, of the eighteen chemicals identified in Task 1. A draft report has been provided for comment and is currently being reviewed.

## **TASK 3: Microbial degradation trial of screened potentially hazardous chemicals**

### **BACKGROUND**

Chemicals identified to be potentially hazardous through the Screening Assessment (Task 2) will be used in microbial degradation trials to determine persistence in soil and groundwater samples from the Queensland study area.

### **TASK OBJECTIVES**

- Field sampling to obtain two bore water and two soil samples.

- Sufficient samples for chemical testing and measurement of degradation of chemicals
- Detailed chemistry of two water and two soil samples to be done.
- Replicated microcosm biodegradation trials in soil and water samples for potentially hazardous chemicals. Water microcosms will be incubated for 3 months and soil microcosms will be incubated for 1 month.
- Chemical analyses will be undertaken at the start and end of the biodegradation experiments to determine the extent of biodegradation of the chemical by microbes present in water and soil samples.

#### **TASK OUTPUTS AND SPECIFIC DELIVERABLES:**

Brief technical report detailing microbial biodegradation trials of high-risk chemicals in soil and water samples collected from the Queensland study area. Potentially hazardous chemicals that are persistent in soil and water samples will be taken forward.

#### **PROGRESS REPORT**

This milestone is partially complete.

The soil microcosm experiments for this task have been completed and stored at -80°C. The aquifer microcosm experiments are due for completion late January 2024 (due to the 3 month incubation period). Analysis of chemical degradation will be carried out on both soil and aquifer microcosms in March 2024.

#### **TASK 4: Communicate H.2 and H.3 Part A project progress and findings to stakeholders**

##### **BACKGROUND**

Communications of GISERA research are an important component of outreach and dissemination of findings to diverse audiences.

##### **TASK OBJECTIVES**

- Communicate H.2 and H.3 Part A project progress and findings to stakeholders through fact sheets, interviews, meetings, infographics and/or animations. This task will be done in collaboration with GISERA Communications officers.

#### **TASK OUTPUTS AND SPECIFIC DELIVERABLES:**

Communicate H.2 and H.3 Part A project progress and results to GISERA stakeholders.

#### **PROGRESS REPORT**

This milestone will be completed in March 2024

#### **TASK 5: Desktop exposure assessment**

##### **BACKGROUND**

The desktop exposure assessment will include industry and government reports/data, and an analysis of relevant information for the COPCs identified in Tasks 1-3. This assessment will focus

on data from the most recent use of these chemicals in the study area and will determine timing and location of recent COPC usage.

#### **TASK OBJECTIVES**

- Provide information about the timing and location of recent COPC usage in the Queensland study area. This information will guide Tasks 6 and 7.

#### **TASK OUTPUTS AND SPECIFIC DELIVERABLES:**

Brief technical report detailing the timing and location of recent COPC usage in the Queensland study area.

#### **PROGRESS REPORT**

This task is complete.

The desktop exposure assessment has examined the geographic distribution of CSG industry use of various chemical factors of potential concern (COPCs) in the study area around Chinchilla, Miles and Condamine.

Chemicals examined include: methylisothiazolinones (MIT/CMIT), dazomet, fluorobenzoic acid tracers, glutaraldehyde, naphthalene, nonylphenols, polyacrylamide (principally its monomer, acrylamide), tetrakis (hydroxymethyl) phosphonium sulfate (THPS) and tributyl tetradecyl phosphonium chloride (TTPC). These COPCs vary in their use patterns within the study area. Some, for example, dazomet, have been only used in a very small number of wells in a geographically narrow area, while others, like glutaraldehyde have been used more widely across the study area. Similarly, the biocide THPS has been comparatively widely used, while MIT/CMIT have only been used in a very restricted number of wells in a limited area. These data have been collated and will be used for determining sampling sites for the field campaign (tasks 6 and 7).

This data will be presented in the final report.

### **TASK 6: Sampling logistics**

#### **BACKGROUND**

Results from the desktop exposure assessment (Task 5) will be used, along with consultation with this project's TRG and other industry contacts, to guide the sampling campaign to ensure that appropriate and representative water and soil samples are collected for the exposure assessment.

#### **TASK OBJECTIVES**

- Identification of sites for water and soil sampling to ensure adequate representative samples for COPC exposure assessment.

#### **TASK OUTPUTS AND SPECIFIC DELIVERABLES:**

This task will yield a series of documents describing the contacts, sampling sites, relevant permissions, sampling equipment and OH&S considerations for the exposure assessment (Task 7).

#### **PROGRESS REPORT**

For the purposes of the field campaign, the study area has been subdivided into ~12 grids from which ~70 ground and surface water samples will be obtained from subsurface aquifers (for

domestic or agricultural use) or water features on the surface. ~30 samples (3 per grid) will be obtained from the study area.

Data from the exposure assessment has informed the field campaign, though it is important to note that all collected samples will be examined for all COPCs, regardless of whether their use was restricted or widespread.

Various stakeholders (including landowners, local government and industry partners) have been contacted regarding conducting the sampling campaign in early to mid-April 2024.

This milestone will be completed end of March 2024.

## **TASK 7: Sampling campaign- exposure assessment**

### **BACKGROUND**

Task 7 will involve two staff traveling to the Queensland study area with the purpose of collecting representative water and soil samples across the region for exposure assessment of COPCs.

### **TASK OBJECTIVES**

- To collect groundwater and soil samples from sites identified in Task 5 and 6, for the purpose of analysing COPC presence and concentration within the Queensland study site (Task 8).

### **TASK OUTPUTS AND SPECIFIC DELIVERABLES:**

Collection of water and soil samples for analyses for the presence and concentration of COPCs within the Queensland study area.

### **PROGRESS REPORT**


This task will be completed by end of April; field work is planned for week 2 or 3 in April.




## **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

<b>DATE</b>	<b>ISSUE</b>	<b>ACTION</b>	<b>AUTHORISATION</b>
<b>20/10/23</b>	This task was delayed due to scheduling of sample collection and due to risk assessments for safe handling of the chemical dazomet.	Milestone 3 extended from August 2023 to February 2024  Milestone 4 extended from October 2023 to March 2024	

		<p>Milestone 5 extended from September 2023 to November 23</p> <p>Milestone 6 pushed back from October 23 to November 23</p>	
<b>03/04/24</b>	This task was delayed due to the field campaign now being conducted in April 2024.	Milestone 6 extended from November 2023 to March 2024	
<b>03/04/24</b>	This task was delayed as field work is now planned for week 2 or 3 in April.	Milestone 7 extended from February 2024 to April 2024	
<b>03/04/24</b>	This task is delayed due to knock on effects of Task 5 and 6. It is estimated that the chemical analyses will be completed by mid-May.	Milestone 8 extended from March 2024 to Mid-May 2024	



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