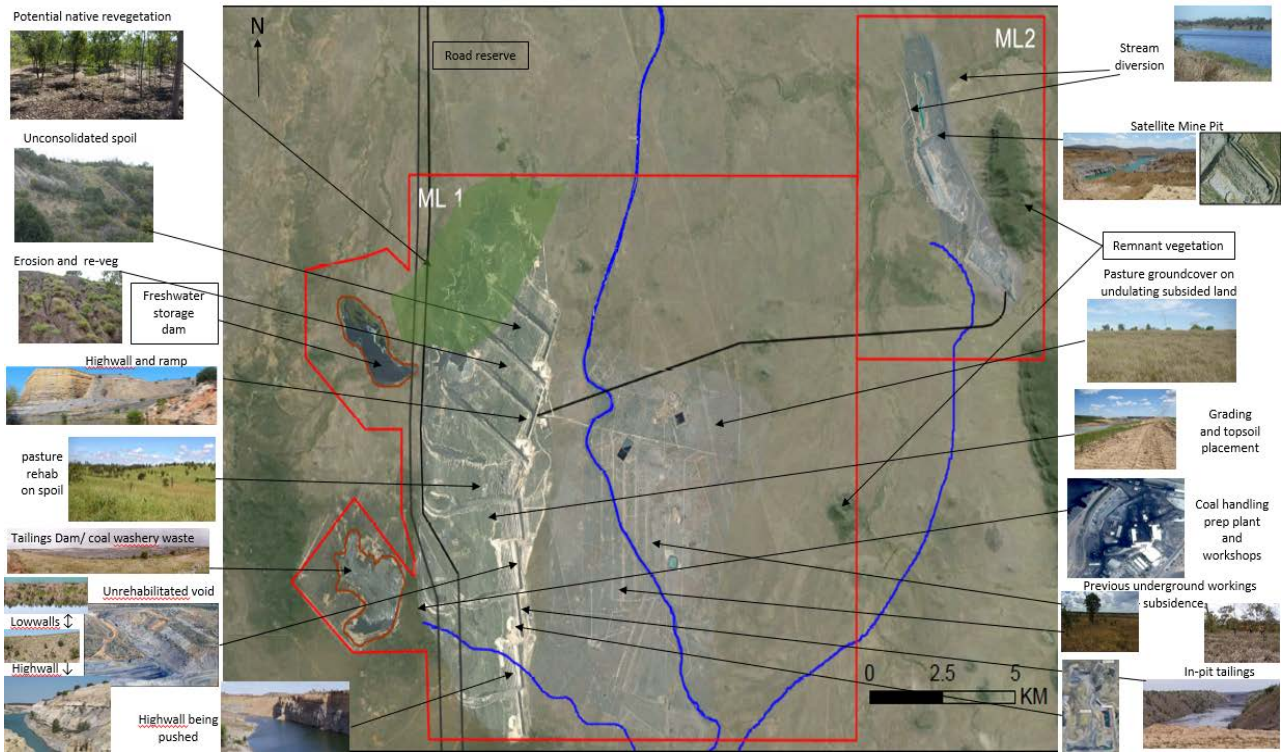
Stakeholder involvement in planning to maximise the benefits and acceptance of land packages post-coal-mining in Central Queensland

ACARP Project C25032



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Research Ethics

This study was approved by the CQUniversity Human Research Ethics Committee (Approval H16/11-305) according to the National Statement on Ethical Conduct in Human Research.

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Abbreviations

ACARPAustralian Coal Association Research Program
AEValues per beast area
DEHP(Queensland) Department of Environment and Heritage Protection
DES(Queensland) Department of Environment and Science
DRNM(Queensland) Department of Natural Resources and Mines
EIAEnvironmental Impact Assessment
EISEnvironmental Impact Statement
NRMNatural resource management
QGQueensland Government
SLTOSocial Licence to Operate
ToR Terms of Reference

Findings in a Nutshell

This project sought to identify and evaluate models for stakeholder involvement in post-mining land use change issues in the Bowen Basin.

The key data collection method was four workshops with a cross section of stakeholders, held in Blackwater between February and September 2017.

Outcomes of the workshop discussions about factors relevant to post mining land use were:

- Stakeholder engagement was viewed as important for planning end-of-mine land use change,
- Grazing was viewed by stakeholders as a viable land use on post-mining lands.
- Landholders will accept 'packages' of land that have a mix of productive and non-productive country types, and do not require every hectare of the property to be productive.
- There was some support for some mining lands to be returned to native vegetation, but only as part of grazing properties.
- Options for making post-mining land suitable for grazing enterprises would need to be negotiated on a case by case basis,
- Ideally the planning and engagement would not be last-minute and the end-use landholder would be determined before mine closure, perhaps with the transition involving a lease arrangement followed by eventual purchase.
- There was some more limited interest in other options for land use, such as biofuels or farming.

Five examples of stakeholder panels suitable to assess resource management issues were identified, and guidelines developed to match the type of engagement to the relevant framework and goals:

- Community reference group
- Special issue group
- Community reference panel
- Expert reference panel
- Taskforce.

Limited differences in views were identified between stakeholder groups in the workshops, indicating potential to generate agreement about post-mining land uses and ameliorate key concerns. The limited variation in views across different sectors also provided a baseline case for engagement and planning processes to develop consensus positions understood as general agreement or acceptability.

After Stakeholder analysis and formation of panel/s, the process used across the workshops involved a sequence of five steps:

- Identify relevant issues and areas where extra information is required (Workshop 1)
- Individual priorities and interests for planning at site level (Workshop 2)
- Expert input to refine planning. (Workshop 3)
- Group planning exercises for post-mining land use change drawing on experience (Workshop 3)
- Technical input to consolidate plans. Confirmation of stakeholder agreement to the final plan (Workshop 4)

Based on their experience of this process and examination of case studies, stakeholders discussed options and models for stakeholder panels: considering who, why, how, when and what. The results of the workshop process demonstrated how diversity in individual views could be consolidated through group discussion processes and other inputs over successive workshops to generate consensus views about post-mining land use change. However, challenges still remain to ensure that outcomes are consistent over time and space, given that options are context-sensitive, the stakeholders do not always agree and that group outcomes can vary with the individuals involved.

Executive Summary

Executive Summary

This project sought to tease out models for stakeholder involvement in post-mining land use change issues and to identify issues relevant to engaging with stakeholders in reference panels or other group processes.

The project had four aims:

- To identify the key factors that are likely to be relevant to future landholders, local communities, Aboriginal traditional owners (where relevant) and other stakeholders when negotiating closure of a mining operation (see section 4.1 and attached Reports 1 and 5);
- To model the economic returns and flows from transitioning mining leases to agricultural and other land functions (see section 4.2 and attached Report 1);
- To test the use of different local expert/stakeholder panel models to select and negotiate preferred scenarios for mine closure and subsequent land use(s) (see section 4.3 and 4.4 and attached Reports 2 and 3); and
- To use the findings to assist in the development of a process for negotiating mine closures that aligns with local community and stakeholder needs and acceptance (see sections 4.5 and 4.6 attached Reports 4 and 5).

While there are Queensland Government requirements that there will be some level of community and stakeholder agreement about post-mining land uses, there is no current standard or level of understanding about:

(a) Appropriate and effective timing and mechanisms to engage stakeholders and communities in post-mining land use decisions
(b) The extent to which an engagement and consultation process with key stakeholders can lead to a convergence of views and agreement about post-mining land use.

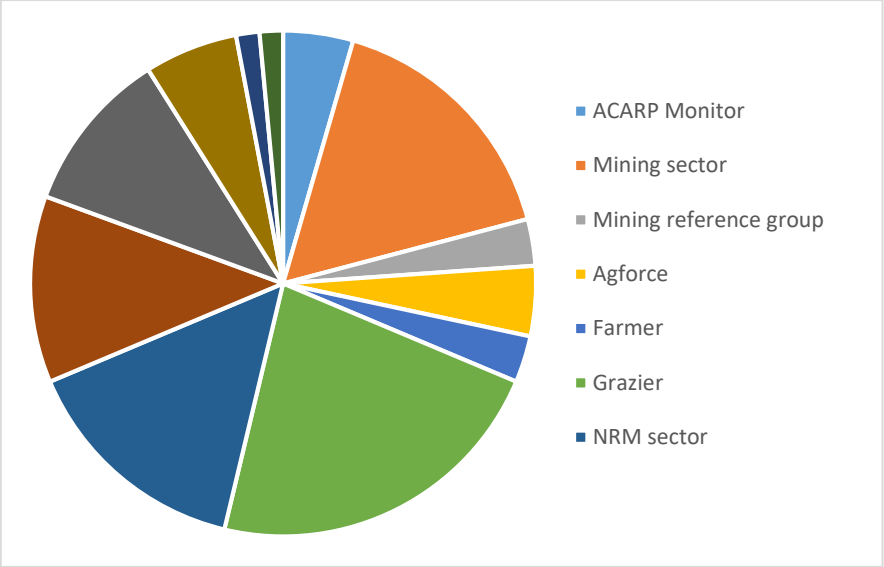
Method:

This research involved four main stages between March 2016 and February 2018:

- Review of past research and relevant guidelines
- Consultation and interviews with more than 20 stakeholders
- Conduct of four workshops with key stakeholders, using maps of a mock-up mining lease
- Analysis and reporting

The project has involved a number of stakeholders relevant to post-mining land use change in the Bowen Basin. These were mining-affected people with considerable knowledge about some aspects of Central Queensland land uses and economy; with strong connections to one or more identified stakeholder groups (e.g. local landholder, traditional owner, natural resource manager; local council or local environment groups); and with motivation and availability for the sequence of workshops. These stakeholders were especially engaged in the four workshops that used a hypothetical scenario but were designed to match, as closely as possible, with the processes that could be followed in an actual case. All participants were invited on the basis of their close involvement with relevant issues. For example, the targeted landholders were those who were mine neighbours or leasees or owners of mining land, while mining representatives had environmental and/or community engagement responsibilities. A summary of the workshop participants across sectors is provided in Figure ES1.

Figure ES1: Participation by sector across four workshops



Key results:

Outcomes of the workshop discussions about **factors relevant to post mining land use** were:

- Grazing was viewed by stakeholders as a viable land use on post-mining lands.
- Landholders will accept 'packages' of land that have a mix of productive and non-productive country types, and do not require every hectare of the property to be productive.
- There was some support for some mining lands to be returned to native vegetation, but only as part of grazing properties.
- Options for making post-mining land suitable for grazing enterprises would need to be negotiated on a case by case basis,
- Ideally the planning and engagement would not be last-minute and the end-use landholder would be determined before mine closure, perhaps with the transition involving a lease arrangement followed by eventual purchase.
- There was some more limited interest in other options for land use, such as biofuels or farming.

Common issues of concern that were identified included:

- Risks of future environmental or financial liabilities being transferred to grazing operators.
- The management of sensitive or contaminated areas, and requirements on landholders or titles to achieve this
- Clarity about responsibility for major legacy issues and residual risk
- Water, access, layout, remaining infrastructure and the mix of vegetation and pasture were considered important site characteristics.

More details about these aspects are provided in section 4.1 and attached Reports 1 and 5.

Expected economic returns from grazing rehabilitated mine lands have been modelled to vary between 44% and -5% of returns from undisturbed grazing lands, assuming some base line level of additional maintenance costs and impacts of conditions and covenants. This modelling is based on the assumption that productivity of rehabilitated mining relative to grazing lands varies from 75% to 25%. A sub-set of workshop participants estimated that the productivity of rehabilitated spoil areas, underground mined

areas and rehabilitated tailings dams and pits could have productivity of 68%, 80% and 20% respectively of that of undisturbed grazing lands.

For more details see section 4.2 and attached Report 1.

Key benefits of involving community and stakeholders in consensus approaches include:

- more diversity of knowledge and values
- ability to adjust to dynamic situations
- greater transparency of decision processes
- improved quality of decision processes
- improved negotiation of political solutions between competing interest groups.

As well, exchanges in groups can add value to post-mining land use planning by:

- enhancing mutual understanding
- generating new options
- decreasing hostility and conflict between sectors
- enlightening policy makers
- producing competent, fair and optimised solutions
- facilitating consensus, tolerated consensus and compromise

More details of the evidence about stakeholder engagement are provided in Section 4.3 and attached Report 2.

Forms of stakeholder consultation and engagement need to be tailored to the specific purposes and contexts, by identifying the relevant level of function and involvement, as in Table ES1.

Table ES1: Types of engagement suitable for post-mining land use planning

Option	Type of engagement (stakeholder empowerment	Description
A	**Inform** *[Can be passive e.g. leaflets, press reports or websites; or active e.g hotline, public briefing, open day)*	Company uses in-house information and existing routines to formulate a rehabilitation and closure plan and informs stakeholders of it and the rationale
B	**Consult** *[Can be individually or in groups e.g. interviews, surveys, expert panel, field trip]*	Company consults with experts and selected stakeholders to internally formulate a rehab and closure plan and informs stakeholders of how their input influenced the plan
C	**Involve** *[E.g. focus groups, advisory committee, options taskforce]*	Company dialogues with stakeholders to learn their values, preferences, concerns and constraints and reports the ideas and suggestions they incorporate into the plan
D	**Collaborate** *[E.g. Interactive workshops maybe with presentations and exhibits; Appreciative enquiry; Delphi iterations]*	Company dialogues with stakeholders to learn their values, preferences, concerns and constraints, incorporates as much as possible into the rehab and closure plan and then collaborates and takes stakeholder advice in implementing
E	**Empower** *[E.g. Consensus Conference, Delegated decision, Referendum]*	Jointly plan rehab and closure on the basis of mutually understood values, preferences, constraints and concerns and work to implement it sharing authority, responsibility and resources

After identifying the most suitable type of engagement, to suit the purpose, a next step is to choose a model of operation aligned with the purpose and scope.

Five examples of stakeholder panels relevant to resource management issues were reviewed, roughly in increasing order of complexity, engagement and responsibility:

- Community reference group (e.g. Rolleston Mine Community Reference Group)
- Special issue group (e.g. Glencore Groundwater and Environment Reference Group)
- Community consultative panel (e.g. Gladstone LNG Regional Community Consultative Committee)
- Expert reference panel (e.g. Fitzroy Partnership for River Health Expert Scientific Panel)
- Taskforce (e.g. Fitzroy River Water Quality Technical Working Group)

Participation in the various workshops aligned with one or other of these models. . One area of interest was to establish the extent of agreement about post-mining land use achieved through deliberative workshops of various models.

Agreement about post-mining land uses

The extent of convergence of views about a range of issues associated with mine closure and conversion back to other land uses was assessed from survey responses from 26 participants in the workshops. Graphical summaries of the variation in views between stakeholder groups are summarised in Figures ES2 and ES3 for production and rehabilitation issues respectively. The results identified limited systematic differences between six types of respondents in the reference panel workshops. There was little difference in average scores between the representatives of the business, mining, pastoral and NRM sectors, and slightly more different views held by representatives of the conservation and State Government sectors. Importantly, no statistical differences in views could be identified between representatives of the mining sector and the pastoral sector, indicating potential to generate agreement about post-mining land uses. The limited variation in views across different sectors also provided a baseline case for engagement and planning processes to develop consensus positions with deliberation resulting in generally acceptable solutions. Section 4.5 and attached Report 4 give more details.

Figure ES2: Average rating of productivity questions by stakeholder groups

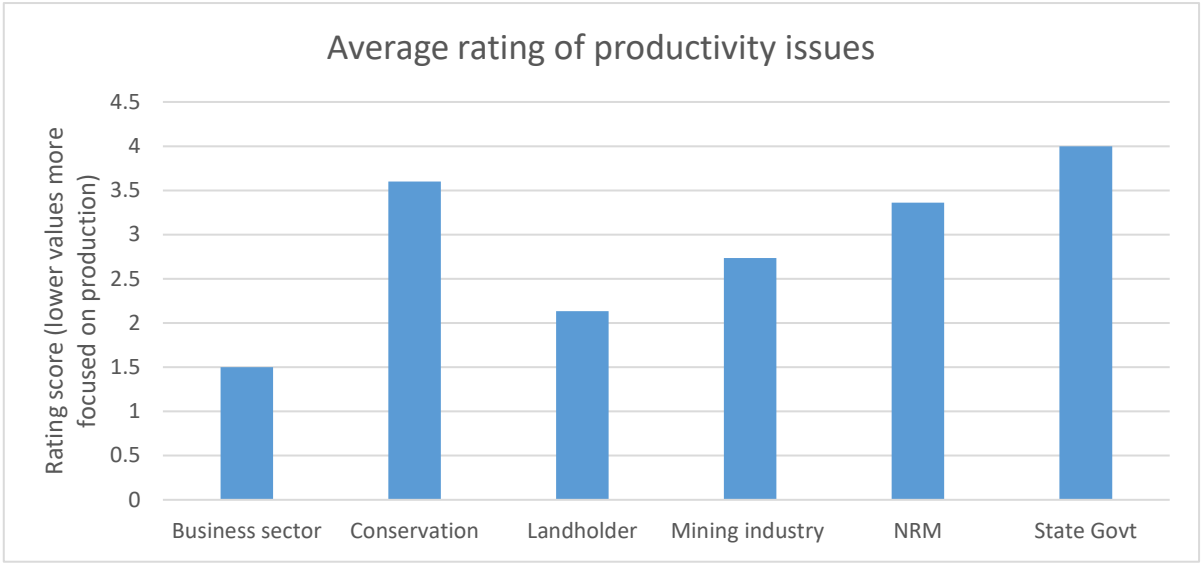
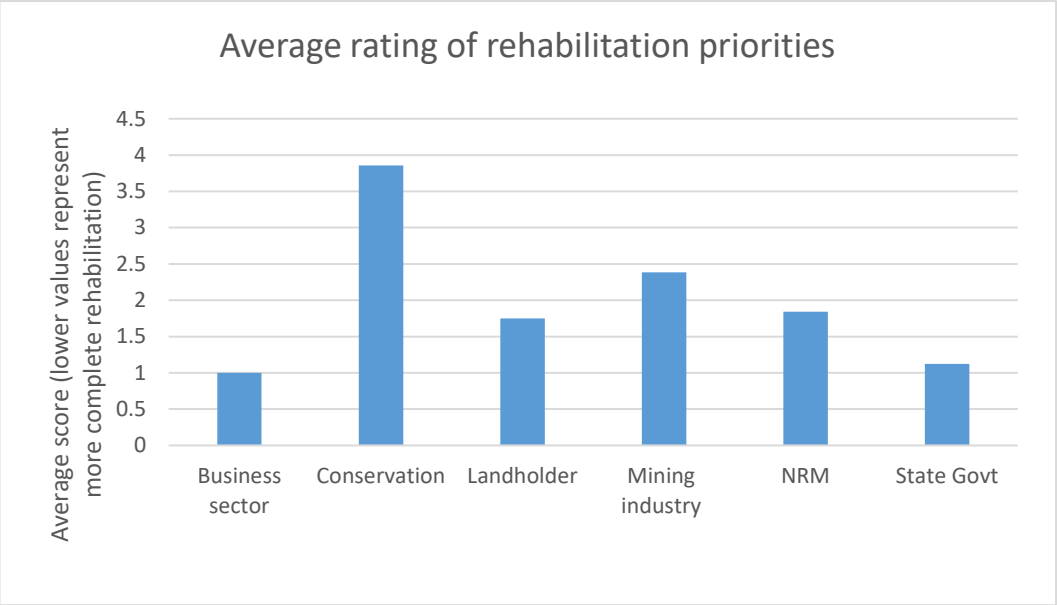


Figure ES3: Average rating of rehabilitation priorities by stakeholder groups



Demonstrating a deliberative workshop process

The process of deliberation used across the workshops involved a sequence of five steps each of which requires specific decisions and requires particular considerations:

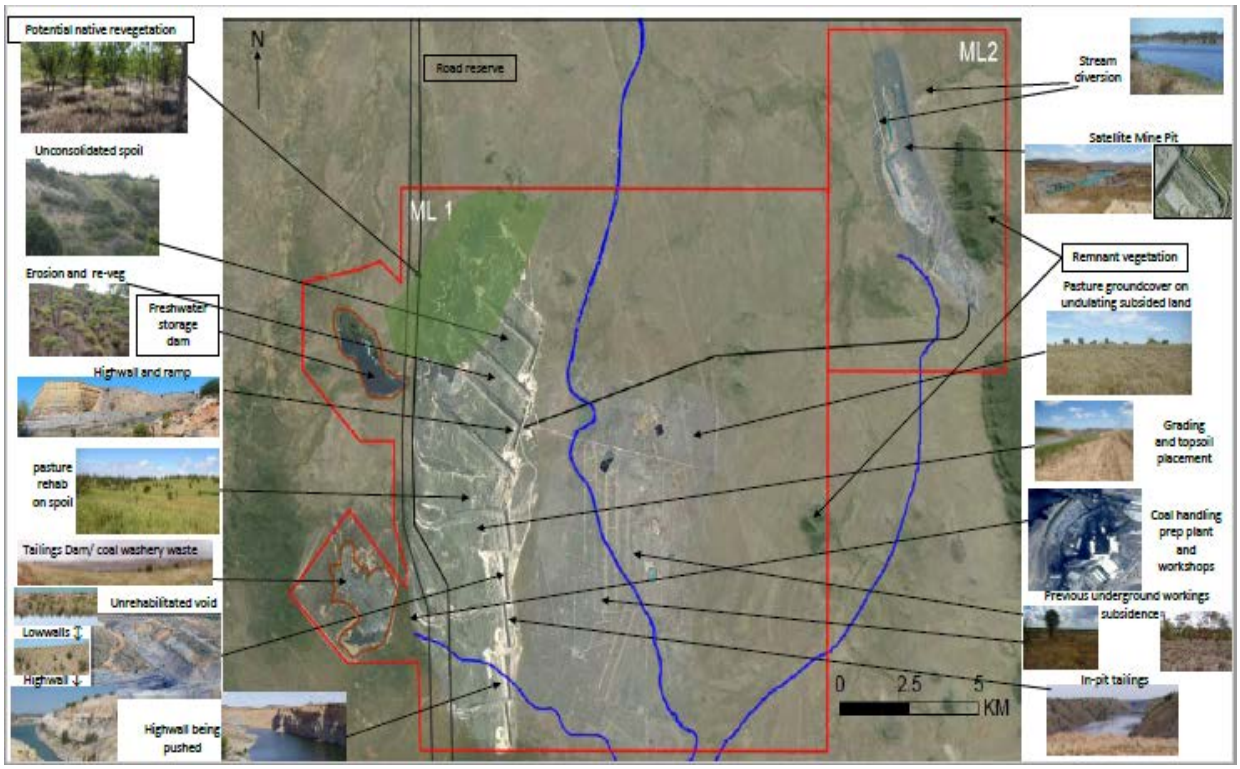
- Identify relevant issues and areas where extra information is required (Workshop 1)
- Individual priorities and interests for planning at site level (Workshop 2)
- Expert input to refine planning. (Workshop 3)
- Group planning exercises for post-mining land use change drawing on experience (Workshop 3)
- Technical input to consolidate plans. Confirmation of stakeholder agreement to the final plan (Workshop 4)

Based on their experience of this process and examination of case studies, stakeholders discussed models for stakeholder panels. To this end, in workshop 4, they also considered: who, why, how, when and what options for stakeholder input.

The use of a sample mock-up mine with successive workshops demonstrated how iterative processes in group settings can generate shared agreement about final mine land uses. Figure ES4 shows the mock mine that was used as a case study for the workshops.

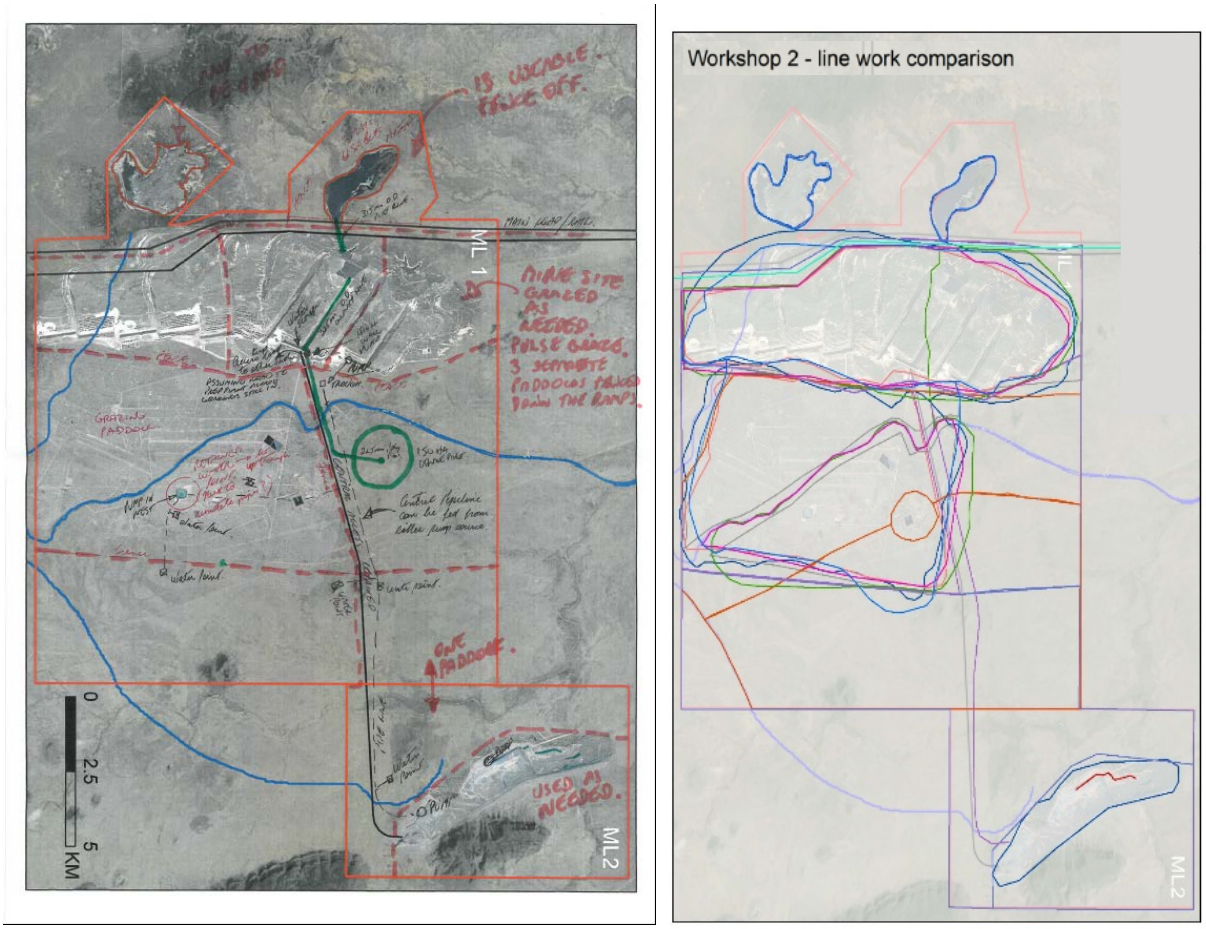
More details of the workshop process for negotiating transfer of post-mine land to grazing in a state acceptable to stakeholders are provided in section 4.6 and attached Report 5.

Figure ES4: Hypothetical mine with typical domains identified used in the second landholder workshop



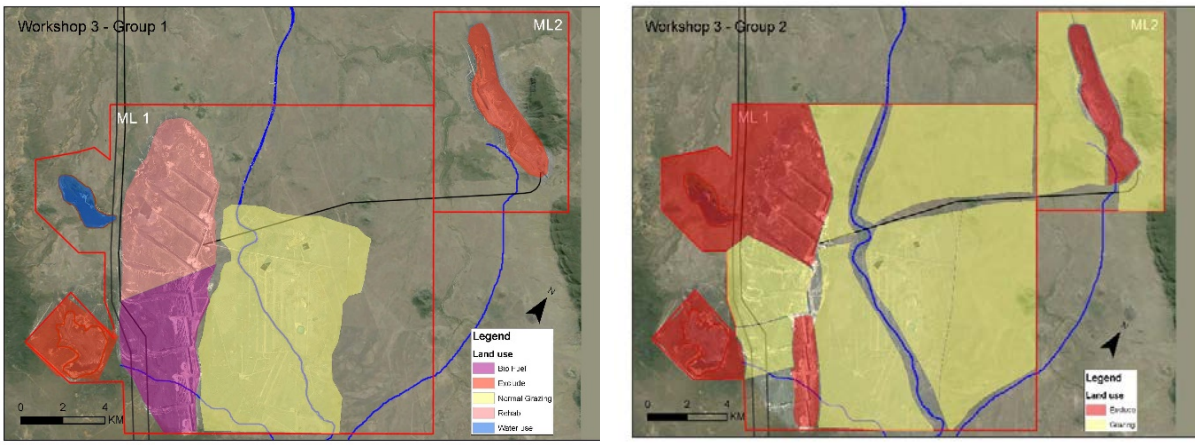
In workshop 2, each individual participant was asked to identify how they would plan the post-mining land use on the exercise provided. These individual exercises generated very different responses, although there was some consistency in the identification of domains that would need to be separately managed (Figure ES5).

Figure ES5: (Left) An individual stakeholder's post-mining land use options; (Right) Summary of individuals' post-mining land use options (each colour represents a different person)



When the same exercise was repeated as a group exercise in workshop 3, with each group made up of members from different sectors, the planning became more detailed. However, there were some large differences between groups, indicating that the results of a consultative process depend on the individuals involved (Figure ES6).

Figure ES6: Post-mining land use options identified by two separate groups

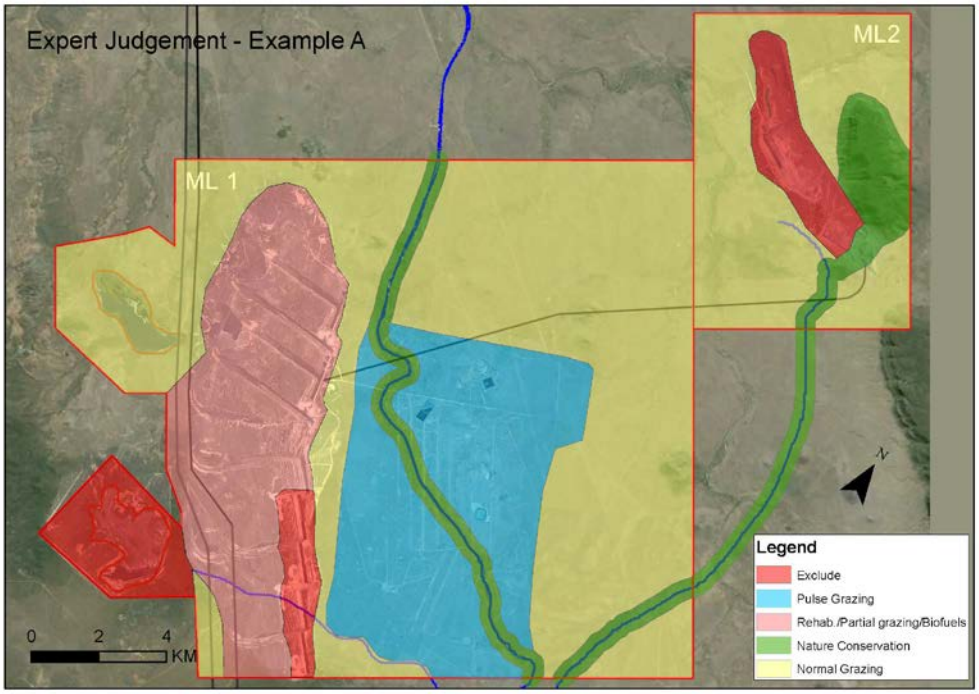


A technical planning process was used to reconcile the maps from the group exercises, selecting the most cautious outcome from among the groups for each domain, assuming that if the groups had to negotiate a combined outcome that they might be more inclined to agree about exclusion rather than use.

Under this approach there were some general features as illustrated in Figure ES7:

- the un-mined (or buffer) land would continue to be grazed as normal,
- some areas would be re-established to biodiversity,
- there would be controlled/pulse grazing on underground mined areas,
- some spoil and pits and the tailings dam would be excluded from grazing, and
- some spoil areas would be rehabilitated for limited grazing or alternative agricultural use.

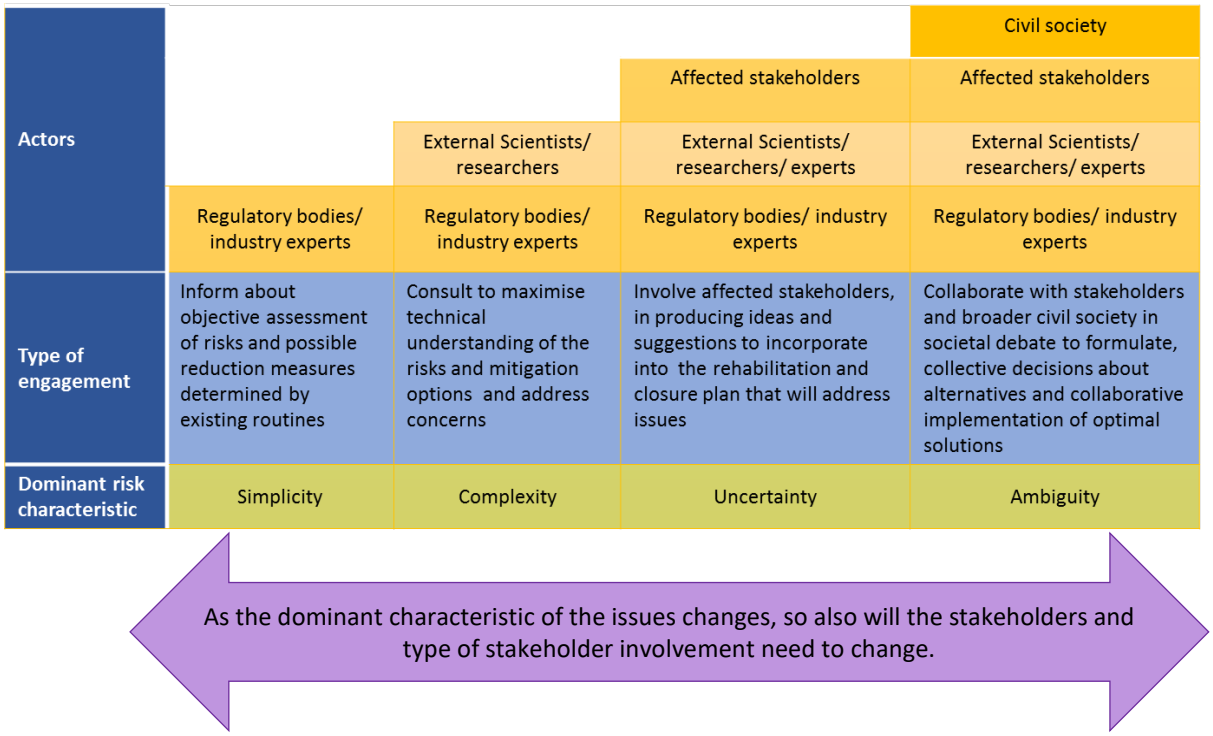
Figure ES7: Technical judgment for post-mining land use based on the groups' exercises



Processes for stakeholder engagement

There are a number of different types of processes that can be used to engage with stakeholders and, more broadly, with communities. These vary by factors such as the participants who are targeted, the complexity of issues addressed, and the types of engagement processes (Figure ES8).

Figure ES8: Types of engagement processes aligned with risk characteristics and actors



Source: Adapted from IRGC (2012:18) and IAP2 (2006).

Five well-documented models of stakeholder engagements currently being used in the mining/NRM sectors in Queensland have been identified in the study:

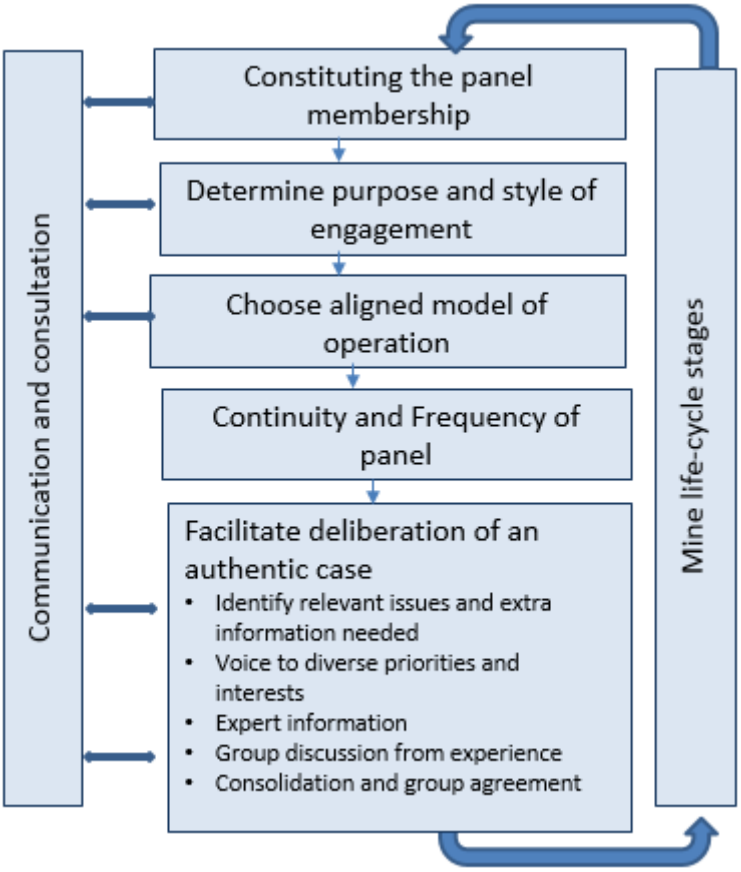
- Community reference group (e.g. Rolleston Mine Community Reference Group)
- Special issue group (e.g. Glencore Groundwater and Environment Reference Group)
- Community consultative forum (e.g. Gladstone LNG Regional Community Consultative Committee)
- Expert reference panel (e.g. Fitzroy Partnership for River Health Expert Scientific Panel)
- Taskforce (e.g. Fitzroy River Water Quality Technical Working Group)

A series of five design questions are recommended as a means of identifying the type of panel and engagement process that is required, as well as the way in which a panel should operate:

- WHO is involved: the number and sorts of people, and how they are appointed.
- WHY the panel functions: its purpose, brief or Terms of Reference.
- HOW the panel operates: resourcing, meeting structure and governance, chairing, agenda-setting and use of outputs.
- WHEN the panel operates: At what stage of mine life (or issue relevance), how often it meets, how long it operates.
- WHAT sequence should the panel follow in deliberating about the issues and options it identifies.

These various components of the process of establishing and engaging a stakeholder panel are summarised in figure ES9.

Figure ES9: Summary process of establishing and engaging a stakeholder panel



Section 4.4 and attached Report 3 provide more details of models for stakeholder engagement.

In summary, the results of the project can be highlighted as:

1. The key factors relevant to transferring mining land back to grazing are identified.
2. The economics of transferring mining lands back to grazing uses are quantified.
3. The underlying drivers and benefits of engagement and consultation processes are identified.
4. Different stakeholder groups are shown to have similar views in regards to post-mining land use issues (and the processes by which these may be dealt with)
5. Key features of different models that can be used for stakeholder engagement are identified and aligned with different purposes.
6. The strengths of a workshop-based process to develop an agreed view about post-mining land use is demonstrated.
7. Guidance is provided about steps in a process of engaging a stakeholder panel.

Further detail about these findings is available in sections of the main report and in the attached reports.


Weather station
East South Void
Main Report

1. Introduction - About the Research

As decades-old coal mines in Queensland approach the end of production, miners seek clarity about expectations with respect to rehabilitation and closure so that they can be certified as meeting completion criteria including being able to support an agreed land use (DEHP, 2014). With that, companies can relinquish their mining leases, clear site liabilities and handover to a subsequent land user. Current mining and environmental policies and processes in Queensland outline roles for the mining company and the regulator at various stages of mine closure planning, and also specify that there should be continual stakeholder involvement. However, there is no elaboration on that stakeholder involvement and the perspectives of stakeholders are frequently overlooked as 'scientific experts' in government, mining companies and academia determine performance standards. The project sought to tease out models for stakeholder involvement and identify issues relevant to implementing them.

> *Today, the term "stakeholder engagement" is emerging as a means of describing a broader, more inclusive, and continuous process between a company and those potentially impacted that encompasses a range of activities and approaches, and spans the entire life of a project* (IFC, 2007, p.2).

Mine closure is a standard part of the mining cycle, yet has received much less attention in Australia than approval and development of new mines. In the coal-mining industry, the reasons for this include:

- to date, many more mines have been developed than have closed;
- the key debates about incurring and managing the benefits and the costs of mines typically occur prior to approval; and
- rehabilitation and closure are assumed to be incorporated into mine planning, under the extended life-cycle planning that underpins Environmental Impact Statement (EIS) processes.

However, specific attention to mine rehabilitation and closure is now emerging in Queensland (Queensland Government 2017). It appears that there is growing focus on mine closure policy as a separate topic because:

- more mines are reaching end-of-mine life;
- community standards and expectations about what constitutes appropriate rehabilitation, closure and land use transition practices have changed since the time of original mine approval;
- regulations specifying the conditions for rehabilitation and closure are not as specific for older mines compared with younger mines e.g. the EPA Guideline on rehabilitation requirements was only introduced in 2012 (DEHP 2014); and
- rates of progressive rehabilitation of mined areas have been slower than desired by government regulators.

A notable trend in the regulatory requirements for end-of-mine planning is an increase in requirements for community and stakeholder consultation to ensure that the processes for mine closure and the post-mining land use change meet community expectations. For example, the Queensland Government (2017) proposes increased requirements that the community will be consulted on life-of-mine plans, and that existing mines will transition to life-of-mine plans through the involvement of a community consultation process. This 2017 discussion paper proposes that stakeholders and community will be involved in all key stages of life-of-mine planning, including closure.

While the expectations of increased consultation are explicit, there is little guidance offered around the relevant stakeholders and communities to involve, the process for consultation, and indicators that the

goals of consultation have been achieved. For mine closure issues, the generic requirements from the Queensland Government are that there will be some level of community and stakeholder agreement about post-mining land uses, however there is no current standard or level or understanding about:

(a) Appropriate and effective timing and mechanisms to engage stakeholders and communities in post-mining land use decisions
(b) The extent to which an engagement and consultation process with key stakeholders can lead to a convergence of views and agreements about post-mining land use.

These are the key research gaps addressed in this report. The primary research question was, ''How can input from stakeholders influence goals and outcomes of mine rehabilitation and closure?"

Project Aims:

- To identify the key factors that are likely to be relevant to future landholders, local communities, Aboriginal traditional owners (where relevant) and other stakeholders when negotiating closure of a mining operation (*See section 4.1 and attached Reports 1 and 5*);
- To model the economic returns and flows from transitioning mining leases to agricultural and other land functions (*See section 4.2 and attached Report 1*);
- To test the use of different local expert/stakeholder panel models to select and negotiate preferred scenarios for mine closure and subsequent land use(s) (*See sections 4.3 and 4.4 and attached Reports 2 and 3*); and
- To use the findings to assist in the development of a process for negotiating mine closures that aligns with local community and stakeholder needs and acceptance (*See sections 4.5 and 4.6 and attached Reports 4 and 5*).

2. Background

The Queensland government's requirements for greater consultation in the mining industry, follow a noticeable trend for increased community involvement in public decision-making. Stakeholder involvement in decisions about environmental management and planning have become very closely embedded into policies at local, national and international levels (Raymond et al. 2010; Reed 2008). Approaches to stakeholder involvement have taken different forms, including awareness-raising in the late 1960s, incorporating local knowledge in the 1970s, participation as a 'norm' in the sustainable development agenda of the 1990s, and a 'post-participation' consensus in more recent decades (Reed 2008). Key reasons for involving community and stakeholders in consensus-building approaches include:

- more diversity of knowledge and values;
- the ability to adjust to dynamic situations;
- greater transparency of decision-making processes;
- improved quality of decision-making processes; and
- improved negotiation of political solutions between competing interest groups.

There are some variations in how participation can occur, driven by heterogeneity of stakeholder groups and values, and the complexity of decision-making processes (Luyet et al. 2012). Given this, no single approach to participation appears optimal. Instead, Raymond et al. (2010) argue that successful participation focuses on the processes of engaging participants around problems and the integration of knowledge to solve them.

There are a number of challenges to increasing the use of stakeholder and community consultation around life-of-mine planning, particularly with respect to rehabilitation and mine closure issues.

Currently, there are requirements for community consultation in the planning and approval stages for larger mines through the EIS process. Whilst many mining companies have processes to engage with local communities and neighbouring landholders to foster and maintain good relationships, there are very limited examples of how these groups could be more formally involved in ongoing decisions about rehabilitation standards and closure plans.

Examples of a consultative approach in relation to rehabilitation standards have been the focus of earlier ACARP projects such as Henderson (2007) and related projects such as Owen and Middlin (2010). Both of these projects involved the use of a community stakeholder panel to develop criteria for evaluation and then visual assessment of rehabilitated land on a mine site.

One challenge in moving to a more consultative model for mine closure planning is that the current process is framed around regulatory relationships between the mining companies and the State Government departments that are the regulators. Mining activities in Queensland are regulated by the State Government through the Department of Natural Resources and Mines (DNRM) which issues mining leases, together with the Department of Environment and Science (DES, formerly DEHP) which issues the environmental authority specifying conditions under which a mine must operate. A financial assurance system also exists, where companies provide an environmental bond to the Government as security to cover any remaining rehabilitation obligations on a mine site, after closure. Companies wishing to close a mine must first receive certification from DES that the environmental conditions linked to the environmental authority have been met, and then apply for relinquishment of the mining lease from DNRM. The four goals to be achieved for relinquishment can be briefly expressed as: 'safe, stable, non-polluting and sustains an agreed land use' (DEHP, 2014, p. 13-16). There are annual reporting and compliance mechanisms within this framework, which means that the current process is highly focused on meeting regulatory requirements, with very limited engagement with external parties.

A second challenge in moving towards a more consultative model and empowerment of stakeholders is that it may diminish companies' control of mine rehabilitation and subsequent land use. Currently, the mining companies nominate the types and standards of rehabilitation activities as well as the final land use(s), and then submit them through the annual Plan of Operations in the environmental authority for regulatory approval (or amendment). While the goals of mine planning may change over time, and these can be reflected in changes to the Plans of Operations submitted during the years of production, the system is generally consistent with a life-of-mine planning framework that provides some certainty to companies and regulators about what will be achieved. However, if some of the power over decisions is transferred to communities and stakeholders, as is implied with a consultative model, then this may result in a corresponding diminution of the authority of companies and the regulator, balanced by increasing acceptance of and support for post-mining land uses by local communities.

This background gives rise to two questions: (i) what role can input from stakeholders and potential future land-users play in considering the opportunities and barriers to incorporating ex-mine land into grazing properties; and (ii) what are the characteristics of an appropriate model for engaging and empowering a stakeholder panel to play that role? This research identifies a potential role for stakeholders in adaptive management in collaboration with regulators and mining companies, and a process of long-term engagement of a cross-section of predominantly local people using visual models of an authentic case as the basis for reaching agreements about the land use challenge and reconciling ecosystem, social and economic functions and values.

The focus of the research in this project was to identify appropriate models of collaboration that could be used with regional stakeholders and communities, to identify the key issues around transferring post-

mining lands in the Bowen Basin back to grazing and other purposes, and to test the use of a participatory process with the aid of a simulated ('mock up') mine closure scenario.

The results of the project can be highlighted as:

1. The key factors relevant to transferring mining land back to grazing are identified.
2. The economics of transferring mining lands back to grazing uses are quantified.
3. The underlying drivers and benefits of engagement and consultation processes are identified.
4. Different stakeholder groups are shown to have similar views in regards to post-mining land use issues (and the processes by which these may be dealt with)
5. Key features of different models that can be used for stakeholder engagement are identified and aligned with different purposes.
6. The strengths of a workshop-based process to develop shared views is demonstrated.
7. Guidance is provided about steps in a process of engaging a stakeholder panel.

3. Method

The study focussed on the Bowen Basin where there are 50-60 coal mines at various stages of development, operation or in care and maintenance. It defines stakeholders as those who affect or are affected by a decision or action (Reed et al., 2009). Our list of potential participants from the focus region had diverse stakeholders across multiple sectors. The stakeholders were all groups or individuals deemed to have an interest in the issues, (because of their legitimacy or stake in the outcome); influence (because of their power or ability to affect the outcome) and/or an imperative (in terms of needing the matter to be given immediate attention) (Mitchell et al., 1997; Reed et al., 2009). Recruitment for the workshops used a combination of approaches including telephone and email invitations, and snowballing and resulted in participants from multiple sectors (Figure 3.1).

Data collection involved four main phases of qualitative research: Review, Interviews, Workshops and a final phase to do the analysis, prepare reports and papers, and disseminate results. The analysis included parallel calculations of the likely economic value of post-mining leases and synthesis of responses to a survey of workshop participants on post-mining land use issues.

Stage 1: Review

An initial review identified previous work in this field both in the academic literature and in reports such as previous ACARP projects on related topics. Relevant reports included:

- ACARP Project C14053, which assessed the risks of grazing as a final end use of mining lands in the Bowen Basin. This project identified that grazing is expected to be the preferred end land use in the Bowen Basin, and identified a number of the factors and risks relevant to transferring land back to grazing enterprises (2007, 2008).
- ACARP Project C15035, which tested the appraisal by stakeholders as a method of evaluating land rehabilitation and demonstrating that it has achieved the rehabilitation objectives (2007)
- ACARP Project C9038, which assessed sustainable grazing on rehabilitated lands in the Bowen Basin (2007).
- ACARP Project C23030, which developed a framework for stakeholder and scientific assessment of diversion condition as part of the relinquishment process (2015).
- As well, an industry report of note was: Owen and Middlin (2010), which documented the formation of a reference panel for a future mining operation, inviting members from traditional owners, landholders/neighbours, interest groups, and local government.

Stage 2: Interviews

Individual and group interviews were conducted during 2016 with about 20 stakeholders in Central Queensland and Brisbane, including

- the mining sector;
- government agencies; and
- regional stakeholders, including environmental groups and landholders.

These served to identify issues relating to post-mining land use, the process to close mining operations and transfer ownership to other industries, and opportunities for a consultation process with relevant stakeholder and community representatives to generate shared agreement about future land uses and the processes to achieve them.

Stage 3: Workshops

During 2017, we held a series of four three-hour workshops at the Blackwater International Coal Centre involving 39 Central Queenslanders with a stake in safe and productive use of mining leases once mining is completed. The workshops' goal was to identify, collaboratively with multiple stakeholders, a process whereby stakeholders could be effectively engaged in identifying the issues, opportunities and risks involved and responsibilities, processes, barriers and enablers to:

- Establishing productive end land uses post mining
- Enabling miners to successfully relinquish their responsibility for their mine lease
- Assisting the transition of mining tenements to a subsequent landholder/ land user (presumed to most likely be a grazier)

Each workshop was attended by invited participants. The participants represented a different mix of stakeholder interests including representatives of the pastoral industry, regional natural resource management groups and environmental groups, local and state government officials, and the mining industry. In a group setting, each workshop explored and threw some light on a variety of issues that are often contested with respect to engaging stakeholders. Each workshop was configured with different participants and a different process to allow some comparisons of the outputs and insights (see Table 3.1). The agenda for each workshop is included at appendix 1.

Workshop 1 focused on the broader regional-level and planning issues around converting post-mining lands back to agriculture, including grazing. There were 14 participants, almost all attending as representatives of relevant community sectors in Central Queensland.

Workshop 2 focused on the issues more relevant to landholders for taking on post-mining land, and involved an exercise with a 'mock-up' of a mine-site being closed. This workshop had 13 participants, largely selected on the basis of individuals who were interested in the issues, including eight landholders.

Workshop 3 focused on how small panels of stakeholders might make planning decisions about post-mining land use change, as well as the provision of more technical information back to participants. There were 20 participants at the workshop, drawn largely from attendees in the first and second workshops, who were split into four mixed groups of five people for a second mock-mine planning exercise.

Workshop 4 shifted focus to broader contextual issues around post-mining land conversion and the preferred design of a stakeholder working group and process to engage stakeholders, so that specific recommendations could be developed from the project results. It also involved some presentation of

mapping results from the previous workshops back to participants to gauge their acceptance of consolidated results. There were 14 participants, who had all attended one or more of the previous workshops.

Table 3.1: Workshop Details

Date	Participants	Process	Purpose/ Focus
23rd February 2017	14 participants. Representatives of key sectors in Central Queensland eg. State Government (planning and regulatory functions), mining industry, consultants, peak conservation and agricultural groups plus representative graziers.	Two rounds of an attitudes survey with 23 questions. First individually and then with group discussion to observe the influence of deliberation	Broad regional level and planning issues around converting previous mining leases to agriculture.
27th April 2017	13 participants. Predominantly graziers and landholders with a small mining company, and government presence.	Individual and group activity and discussion focussed on a hypothetical mine closure scenario.	Identifying the perceptions of landholders about the opportunities, risks and relevant considerations about using formerly mining land for grazing.
1st June 2017	20 Participants – drawn from first and second workshop participants. Split into four 'panels' of five people.	Provision of technical information and group designs for post-mining on the hypothetical site.	Noting how small panels might make planning decisions and degree of consistency and variation after dialogue
10th August 2017	14 Participants – all had participated in at least one previous workshop	Endorsement of previous mapping results and discussion of design options for stakeholder panel. Included a site visit.	Group discussion of broader context issues around post-mining land conversion; and pros and cons of various models of stakeholder panels and application to the mock-up

The workshops were designed to match as closely as possible with the types of processes that might apply for a stakeholder or community reference panel, where participants might be invited because of particular interests (e.g. graziers or farmers neighbouring mining operations) or because they represent a relevant sector. The sectors identified as relevant for a stakeholder reference panel included:

- Landholders (graziers and farmers)
- Mining sector (e.g. environment and community managers)
- Primary industry sector (e.g. Agforce)
- NRM sector (e.g. Fitzroy Basin Association or similar)
- Landcare sector
- Environment sector (e.g. Capricorn Conservation Council)
- Local Government
- Business sector (e.g. local Chamber of Commerce)
- Indigenous sector

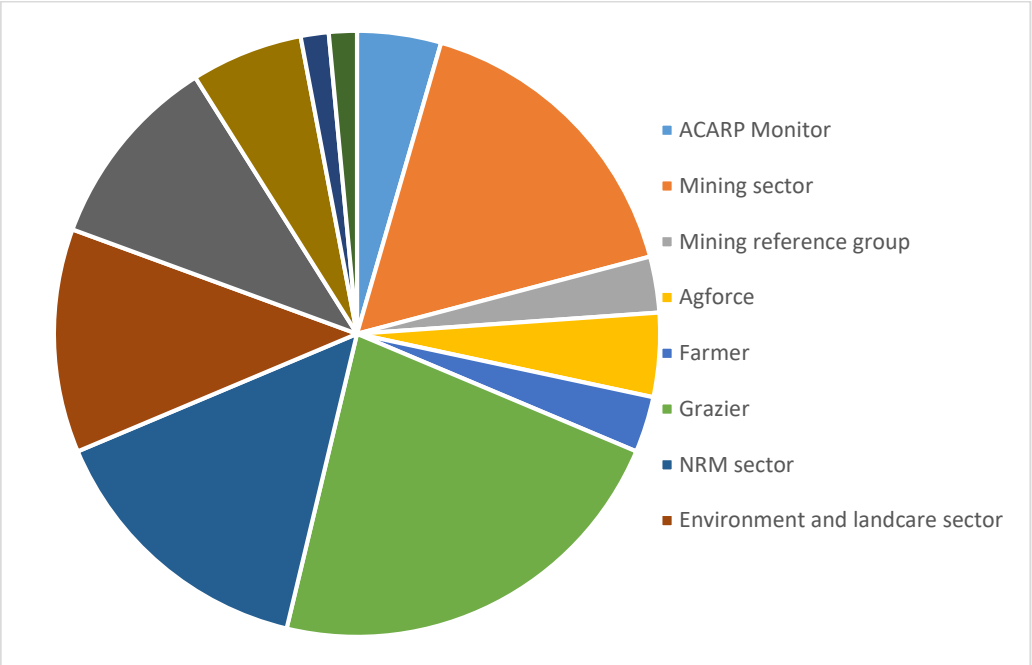
The participation by sector that was achieved across the four workshops is shown in Figure 3.1 (this incorporates some dual roles of participants such as Agforce + grazier).

It proved difficult to generate repeat participation, particularly from landholders. While one landholder attended four workshops, and another landholder attended three workshops, almost all other landholders (graziers and farmers) attended only one workshop. Most had intentions of attending more often, but other factors such as travel distance and work commitments prevented this. There were higher levels of repeat participation from other sectors, particularly the mining sector and the government sector. This reflects a common challenge with stakeholder processes whereby the voluntary commitment of affected local people contrasts with those who participate as part of their work role.

It also proved challenging to achieve participation from the Local Government, Business and Indigenous sectors. The workshop content appeared to have less immediate relevance to these sectors, particularly the Indigenous sector. Perhaps the workshop format needs readjustment to be more attractive and appropriate to these groups. Some interest was expressed by people in the Local Government and Business sectors, but due to other commitments, only one attendee from each sector became involved in a meeting.

At a summary level, 24% of participation was drawn from the mining sector (ACARP monitors, mining sector and/or mining reference group), 30% from agriculture (Agforce, grazing, farming), 27% from the NRM, environment and Landcare sectors, 16% from the Government sector, and 3% from Local Government and Business. In addition, the four researchers (John Rolfe, Jo-Anne Everingham, Susan Kinnear and Delwar Akbar) attended the workshops.

Figure 3.1: Participation by sector across four workshops (n=39)



Stage 4: Analysis

Stage 4 involved analysis of the research. This included the outcomes of the workshops, plus data collected from an online survey of workshop participants, analysis and development of summary maps, and conduct of economic and other analyses of key issues associated with post-mining land use change.

4. Key Results

4.1: Identifying the key factors relevant to transferring post-mining land back to grazing

Relevant considerations to rural landholders

Previous research, including Maczkowiack et al. (2007) has illustrated that the relevant factors that graziers in the Bowen Basin have identified for post-mining land use transfer are:

- The form of caveats or ongoing controls and monitoring over management post-mining (most landholders thought that some form of ongoing monitoring should occur)
- The length of a trial period that might occur before full conversion to permanent grazing tenure (landholders suggested up to five years would be appropriate)
- Who the land is transferred to, with key options including (a) original owners (b) owners of adjoining properties (c) nearby property owners and (d) open tender.
- Alternative land uses of post-mining land where grazing was not appropriate included native vegetation (bushland), recreational uses, forestry or feedlots.
- Extent of the available land holding (larger sizes are more financially attractive)
- Layout and facilities (paddocks should be of an appropriate size and have dedicated watering facilities, plus other considerations such as fencing and access roads).

The results of the current study, drawing largely from the results of workshop 2, confirm that these issues remain relevant to rural landholders who may be interested in using post-mining lands for production purposes.

An important outcome of this project was that grazing was viewed by stakeholders as a viable land use on post-mining lands. Most participants agreed that grazing (probably under ownership of a neighbouring landholder) was most likely to be the primary feasible option for much of the Bowen Basin's mining country, but that a critical factor would be whether a financial return could be gained.

Landholders indicated that they will accept 'packages' of land that have a mix of productive and non-productive country types. There was widespread agreement that the options for making post-mining land suitable for grazing enterprises would need to be negotiated on a case-by-case basis, and that early planning is important. Early negotiation with the future landholder was viewed as essential to ensure the post-mine landscape was suitable for grazing. Ideally, the end-use landholder should be confirmed before mine closure, perhaps through a lease arrangement followed by eventual purchase.

There was some interest in other land use options, such as biofuels or crop farming, but the common view of graziers and other stakeholders was that there would not be commercial returns from non-grazing options.

The workshops revealed that land users do not require every hectare of the property to be productive; nor that it be uniformly used (though opinions varied about the extent to which marginal areas should be fenced out). Landholders indicated that they would consider management of different domains

separately and there was variation in management propositions about specific issues such as where fences might be located; whether to use continuous, rotational or cell grazing and specific timings for management actions and stocking strategies. Most participants indicated these matters would all be subject to a flexible management approach with continual monitoring (of varying degrees of formality) as the basis for adjustments. However, some participants felt that simply fencing an area off was 'walking away from the problem' and that all areas should be available for grazing even if not all were expected to be productive.

Common issues of concern that emerged

Despite individual differences in management styles and proposals, and differing degrees of risk aversion, some issues emerged as prominent considerations for most participants. Those that were particularly relevant to post-mining leases in contrast to a regular property acquisition included:

- Risk is an issue: graziers and other stakeholders were reluctant to see any risk of future environmental or financial liabilities being transferred to grazing operators.
- Due diligence is required before transferring the land use and land ownership with scientific assessment required on tailings dams, water quality, soil quality, slope and vegetation.
- The management of sensitive or contaminated areas, and requirements on landholders such as exclusion, fencing, or monitoring, were identified as important issues to understand.
- Clarity about responsibility for major legacy issues and residual risk (which the new land-user was loathe to assume) was very important. This particularly related to the tailings dam as a domain perceived as high risk. Key examples of responsibilities that should not be transferred to graziers included:
    - Contamination and leakage
    - Extensive infrastructure damage by subsidence
    - Weed and pest infestation
- Legal issues around ownership change were identified, including the form of title and any conditions attached.
- Water resources were seen as crucial – especially secure access to water of satisfactory quality.
- Access throughout the property – getting to and between use-able sections – especially for stock and machinery, needs to be efficient. There may also be broader issues of access and maintenance to be considered, if public roads are involved.
- The vegetation cover is relevant. While pasture is important for grazing production, some (native) bush can be attractive (for shelter, conservation and various functions). However, vegetation that might encourage feral animals or noxious species was seen as problematic.
- Removal of rubbish is preferred, but not necessarily removal of infrastructure – compacted areas and roads, fences, power, bores, and water pipes would often be useful for grazing properties.
- Identifying slope and form of remaining spoil areas and pits is important. Some landholders had reservations about using rehabilitated spoil areas for grazing purposes.

Attached Reports 1 and 5 deal with key factors from different perspectives.

4.2: The economic returns and flows from transitioning mining leases to grazing lands.

The outcomes of the workshops and other research data indicated that, before taking on post-mining land for grazing purposes, a grazier would first consider economic issues across three categories:

- Expected returns from production;
- Direct costs of site maintenance and monitoring; and
- Indirect costs of impacts on title, responsibilities and shared access to site.

Expected returns from production

Expected returns from production of beef cattle grazing can be estimated from either a herd modelling approach, gross margin analysis, or an asset valuation approach. The asset valuation approach is selected here as the simplest to present because it essentially represents the returns after all variable costs of cattle management have been accounted for. This approach involves two steps:

- Convert sale prices for grazing land in the Bowen Basin into livestock equivalents (value per beast area)
- Convert the values per beast area into annual equivalents.

The annualised beast area values provide an indication of what buyers of agricultural land consider to be the annual return after operating costs have been accounted for. For this study the values per beast area (AE) for grazing properties on better quality land in Central Queensland have been identified from Herron Todd White (2015) (Table 4.1), where there are normally 3-5 hectares per beast area.

Table 4.1: Land and Beast Values for Central Queensland

District and land type	**Land value ($/ha)**	**Annualised land value (5% discount rate)**	**Beast value ($/AE)**	**Annualised beast value (5% discount rate)**
Moura/Rolleston Scrub	$1,600 - $1,850	$128 - $148	$3,250 - $4,000	$261 - $321
Central Highlands Scrub	$1,250 - $1,600	$100 - $128	$3,000 - $3,500	$241 - $281
Central Highlands Downs	$750 - $1,100	$60 - $88	$2,500 - $3,000	$201 - $241
Alpha Scrub	$675 - $875	$54 - $70	$2,750 - $3,250	$221 - 261
Average	$1,213/ha	$97/ha	$3,156/AE	$253/AE

Data sourced from Herron Todd White (2015).

The results demonstrate that the expected return per beast on grazing lands in the Bowen Basin region are approximately $3,156 or $253 per annum. In area terms, the expected return is $1213/ha, or $97/ha/year. This is the net return, broadly equivalent to average revenues less average operating costs. The implications of these estimates are that if post mining land could be perfectly returned to grazing capability with no additional management requirements or caveats on the title, the expected demand would be approximately $3,156 per beast area or $1,213 per hectare. As the rural property market increases (or decreases) in the Bowen Basin region from those 2015 values, then the values will change accordingly.

There are three important adjustments to these preliminary estimates that may be relevant.

(i) Lower productivity of post-mining lands

Discussions with landholders in the workshops revealed that the productivity of lands rehabilitated to grazing was expected to be lower than standard grazing country. Four reasons were identified for this:

- Not all land in a mined area may be returned to grazing (e.g. voids may be fenced off),
- The water holding capacity of rehabilitated soils may not be as high as intact lands,
- There may be management conditions that limit grazing pressures and activities, particularly in very wet and dry conditions, and
- Pastures on rehabilitated lands may decline over time as the benefits of initial fertilisation wear off.

It proved difficult to identify a ratio of grazing productivity between post-mining pasture lands and un-mined pasture lands. There are few assessments of the results of cattle grazing on mine rehabilitation pastures, although Grigg et al. (2002) (ACARP Project C9038) are a notable exception. In that study the research identified sustainable stocking rates at sites on the Blackwater and Norwich Park mines of 2.7 and 2.2 ha/head respectively, which were comparable with improved pastures on unmined land in the region. However predicted sustainable stocking rates for a site at the Goonyella Riverside mine of 5.9 ha/head were lower than on unmined land.

However some indication of expected productivity was generated from the workshops. Data was collected from workshop participants on their assessment of the productivity of rehabilitated lands compared to undisturbed grazing land. Using the mid-points of the categories that were offered (e.g. 0-20%, 20-40% and so on), the average productivity of post-mining relative to undisturbed land was identified as:

- Land that has been open-cut mined, then rehabilitated: 65% as productive
- Land that has been underground mined, then rehabilitated: 80% as productive
- Highly disturbed land, e.g. spoil piles, mining pits, washdown areas: 20% as productive

For the purpose of this exercise it is assumed that productivity will be between 25% - 75% of normal grazing lands:

- 25% means that a lower proportion of the mine site is available for grazing, pastures are not as productive, and there are more restrictions over the grazing of sites.
- 50% means that a moderate proportion of the mine site is available for grazing, pastures are reasonably productive, and there are some restrictions over the grazing of sites.
- 75% means that a higher proportion of the mine site is available for grazing, pastures are close to being fully productive, and there are limited restrictions over the grazing of sites.

(ii) Direct costs of site management and monitoring

There may be additional requirements for management associated with a post-mining land use, particularly for items such as:

- Monitoring
- Weed control
- Firebreaks
- Maintaining fences around exclusion zones
- Water infrastructure (watering points/pipes) monitoring and repair
- Minor repairs (e.g. washouts from cattle pads).

(iii) Implicit costs of owning a post-mining property

Landholders on a post-mining site will not have the same unencumbered title and use of the land that would be expected of a normal grazing property. This is because there may be:

- Conditions on the title
- Contractual obligations to manage the land in particular ways
- Requirements to allow access to 3rd parties for monitoring and management
- Risks of rehabilitation failure (particularly in extreme conditions)

One example is available of the expected impact of a mining vegetation offset on the value of a grazing property in the Bowen Basin. The vegetation offset has been contracted by a mining company on a separate grazing property with a total area of 9,000 hectares. This offset is for approximately 200 hectares with annual inspections and monitoring over a 15 to 20 year period. The landholder will not

have any direct costs. A Central Queensland valuer has estimated the negative impact of the vegetation offset on market value of the property because of the 'blot on the title' at $50,000 for the 200 ha[1].

Market apprehension about taking on the title over a post-mining land parcel is likely to exist because:

- Banks are reluctant to lend against encumbered titles
- Banks and landholders are reluctant to fund/purchase land with potential risks
- Landholders are reluctant to have conditions or requirements on land

The extent of impact on land values can also be expected to vary according to the area of the land affected and the severity of the conditions involved.

Bowen Basin Case study exercise

Assume 1,000 hectares of rehabilitated land is returned from mining to grazing use. The land will require some level of ongoing monitoring and management to ensure that rehabilitation is successful, and this is associated with covenants on the title to ensure that the management conditions are complied with. The additional costs are assumed as follows:

- Maintenance costs = 10 additional days for weed control and maintenance of fences and firebreaks, with machinery and equipment included = $10,000
- Impacts on title = $50,000 x 5 (1,000 ha of land) amortised at 5% = $20,000 per annum

Table 4.2: Valuation of post-mining land under three productivity scenarios

Factor	Grazing Land	Post mining land		
		75% productive	50% productive	25% productive
Annual net return (1000 ha x $97)	$97,000	72,750	48,500	24,250
Maintenance costs	$0	$10,000	$10,000	$10,000
Impacts on title	$0	$20,000	$20,000	$20,000
Total annual return	$97,000	$42,750	$18,500	-$5,750

The results of this illustrative example show that expected economic returns from grazing rehabilitated mine lands could vary between 44% and -5% of the returns from undisturbed grazing lands. Values for post mining land will be higher with:

- Increased productivity
- Lower additional maintenance costs
- Lower impacts on title

This material on economic considerations is also covered in attached Report 1.

4.3: The drivers, benefits and challenges of stakeholder engagement

Drivers

Many regulatory and planning processes of government require public and stakeholder consultation, particularly around planning and approval processes. Consultation and engagement are regarded as democratic and empowering and also as having instrumental value in assisting policy makers to deal with areas of public concern, such as environmental management (Howard 2018). Consequently,

[1] A copy of the valuation has been provided to the research team on a confidential basis.

greater community engagement is endorsed in current Queensland Government requirements. However there appears to be little information available about how to integrate the community into decision making processes around the mining and resources sectors, and the format and standard of consultation that would be appropriate.

There is currently recognition of the inadequacies of scientific and technical data and a more holistic appreciation of the uncertainties and issues involved, as well as the surfacing of conflicting views and values and an associated ambiguity about the public interest. Consequently, there is an emerging imperative to engage more segments of society in meaningful ways in dialogue about post-mining land use options, opportunities and risks.

There is a very broad literature on consultation, collaboration and engagement processes, and how these can improve resource management. For example, Renn et al. (1993) identified a three-step process to include the public in decision making processes, while Rowe and Frewer (2004) and Hassenforder et al. (2015) identify more closely the processes under which successful participation can occur. There is considerable literature supporting the value of active knowledge exchange and stakeholder engagement in environmental management (Raymond et al, 2010; Reed et al, 2009; Reed 2008; Luyet et al 2012). This evidence counters concerns about the capacity or responsibility of stakeholders in deliberations about complex and uncertain situations such as satisfactory use of mined land. One survey of more than 200 cases of stakeholder participation in making environmental and natural resource decisions demonstrated the quality of such decisions and that the stakeholder groups have access to adequate scientific and technical knowledge (Beierle, 2002).

Potential Benefits

Key benefits of involving community and stakeholders in consensus approaches include:

- more diversity of knowledge and values,
- ability to adjust to dynamic situations,
- greater transparency of decision processes,
- improved quality of decision processes, and
- improved negotiation of political solutions between competing interest groups.

Of course, stakeholder engagement will not always involve groups. However there is potential for open dialogue in groups to add value to post-mining land use planning in ways that have proved beneficial in other systems of planning, and environmental and natural resource management (Renn 2006: 35):

- Enhancing mutual understanding
- Generating new options
- Decreasing hostility and conflict between sectors
- Enlightening policy makers particularly by mobilising local expertise
- Producing competent, fair and optimised solutions
- Facilitating agreement, consensus, tolerated consensus and compromise

Generating agreement

As a key rationale for involving stakeholders is to generate greater levels of stakeholder and community agreement, it is important to identify what agreement entails. At one level, this is a diffusion process, where generating agreement with stakeholders is likely to lead to increased acceptance and endorsement by communities. This is because stakeholders represent key sectors that may be affected, and because the process identifies key issues to be addressed. So while the process involves stakeholders, the aim is to better align outcomes with community aspirations and goals.

A second aspect is that the level to which agreement can be reached can vary, from unanimous support through to negotiated outcomes with dissenting opinions. There are various possible outcomes of deliberation that imply a degree of convergence on a solution all can 'live with' even if it is not their ideal solution (Renn 2006). Many stakeholder processes aim to achieve some level of consensus agreement, even it is about the process to be adopted to deal with different trade-offs. Definitions of what constitutes consensus varies, but **it is often taken to be** a measure of the general agreement among the members of a certain group or community, with varying approaches to measure consensus, such as percent agreement (Diamond et al. 2014). The concept of consensus also represents the process to find areas of shared agreement, such as "the point at which all can agree" (Zurita 2006, p. 21). Alternatively, consensus "has been reached when everyone agrees they can live with whatever is proposed after every effort has been made to meet the interests of all stakeholder parties" (Susskind 1999 p.6).

However, some argue that a consensus-building approach leads to a focus on the most tractable differences and imprecise general principles, and produces lowest common denominator results in the quest for agreeable solutions rather than quality ones. Therefore, a dialogue that focuses on problem definition, surfaces argumentation and seeks to build mutual understanding of divergent values – or a deliberative approach – is suggested as a preferable alternative (van de Kerkhof 2006). For this project, a deliberative process of discussing the diversity of views as well as uncertainties and information needs preceded an exploration of the extent of and means for convergence of different positions (van de Kerkhof 2006).

The role of a stakeholder panel

The requisites of empowering a stakeholder panel to play a role in agreeing the utility of post-mining land packages include:

a. Ideally meaningful engagement of stakeholders would begin early and continue at intervals throughout operations and the rehabilitation and closure processes. This would allow for adaptive management and community preferences and considerations of utility to be built in alongside consideration of more technical and scientific constraints and objectives and fit with leading practice of planning for closure from the outset (Warhurst and Noronha 2000).
b. The stakeholders involved should be a cross-section of predominantly local people who are potentially affected in some way by closure and by decisions about future land use notably graziers as potential future land-users as well as other 'experts'.
c. The question, challenge or task set for this group should be very open so as not to constrain innovation and the synergies of harnessing multiple resources and diverse experience and perspectives.
d. Group deliberations focused on an authentic case and with the ability to draw upon a range of expertise should play a major part in the process.

The challenges of running an engagement process.

The key challenges and issues of applying engagement processes that were raised in the workshops are summarised below.

Key challenges for stakeholder engagement around post-mining agreed productive use of land:

1. Getting agreement. There is a diversity of views and probably "no single right answer". No individual land-user will want to be constrained by a group decision. Maps generated from the landholder workshops illustrate diversity of approaches to post-mining land use, but also suggest that there is a broad range of 'acceptability' that all can live with, which can be distilled

by group deliberation. This would include issues such as which domains are stable enough and non-polluting enough for a grazier to use and the desirability of having riparian corridors etc.

2. Consultation processes. When to involve people, and which people to involve, are the two important questions raised by most participants. A legalistic view is that the EIS provides the public consultation opportunity on end use and fulfils requirements and thereafter the environmental authority (EA) sets the conditions that no further considerations will influence. However a pragmatic view is that the regulator takes 'safe ground' and makes 'political' decisions even if the science points to it being 'safe, stable and non-polluting' so showing there's community agreement and unlikely to be community backlash will be 'another arrow for the bow' of the mining companies. There remains a question about whether closure and subsequent land use is a special issue at a certain time or a more general issue at multiple times over the life of the mine.
3. Risks of conflict of interest and opportunistic manipulation of the committee by, for example the company or a potential future user (or category of users) being involved in setting conditions for transfer.
4. Consistency may also be an issue. There may be different outcomes with different mines and different panels (which relates to the breadth of the committee's brief – mine-by-mine or broader?).
5. Extended process. Closure planning occurs right from the EIS stage, and there is considerable evolution of all mine plans. For example, there have been moves away from planting exotic grasses to native grass species. Identifying the point/s at which stakeholders should be consulted and maintaining motivation is difficult.

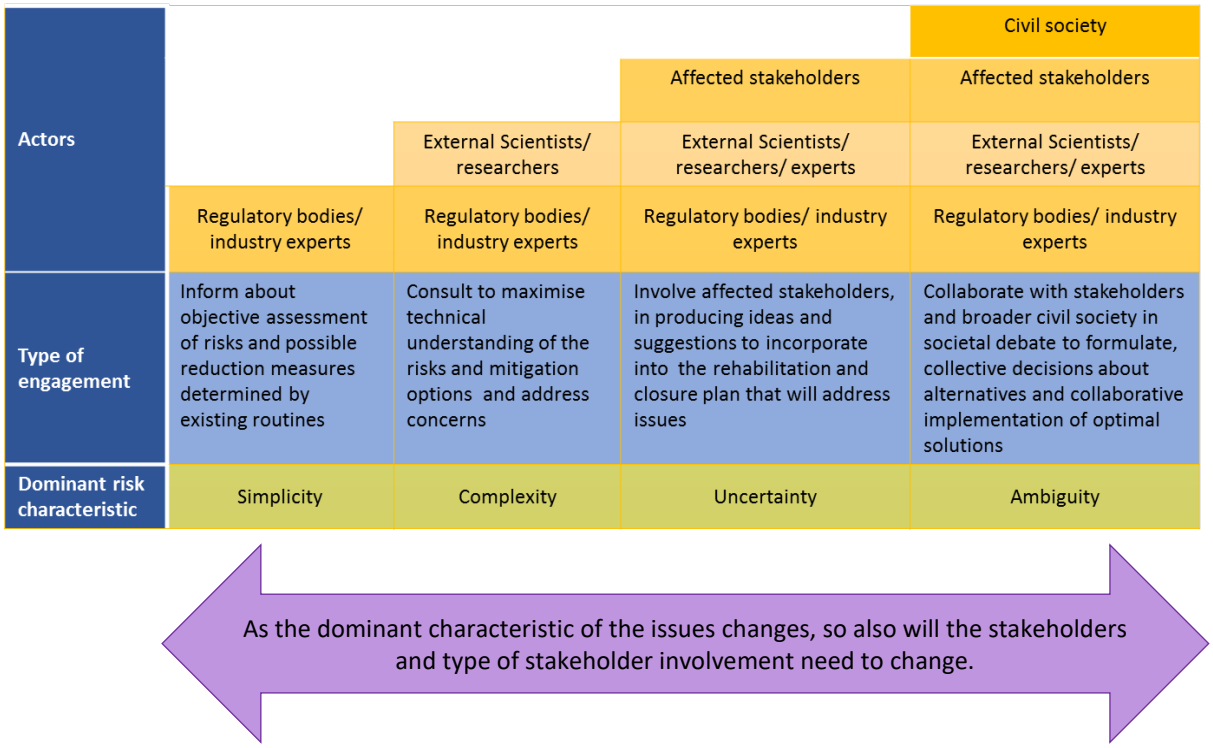
Extra information on evidence about stakeholder involvement in environmental and land use decisions is available in attached Report 2.

4.4: Different models of community and stakeholder engagement

Types of engagement

Given the limited published literature on suitable processes for engagement and consultation with the mining sector in Australia, around post-mining land use planning this project examined models and categorisations of engagement being used for different resource management issues. The variety illustrates that different types of involvement and engagement processes are appropriate for different purposes and tasks (Figure 4.1).

Figure 4.1: Types of engagement processes aligned with risk characteristics and actors



Source: Adapted from IRGC (2012:18) and IAP2 (2006).

In Figure 4.1, the level of engagement around rehabilitation and mine closure issues is shown in four key groups, with increasing levels of involvement but also increasing risk and complexity of issues:

- Simplicity (linear, cause and effect of discrete issues)
- Complexity (multiple, interconnected issues)
- Uncertainty (issues that are difficult to predict with many unknowns)
- Ambiguity (many different values and interests to trade-off and balance)

The stakeholders involved and type of engagement will vary depending on the challenge confronting stakeholders with rehabilitation and closure of large coal mines likely to be complex, uncertain and ambiguous. As mentioned earlier stakeholders include those affected by an activity or decision. Stakeholders can be self-selected or selected based on a stakeholder analysis of various kinds (See Mitchell et al 1997). For example stakeholders may be identified by their proximity to a project, as representatives of demographic, socio-economic or special interest groups or through professional roles. A common approach to analysing stakeholders is a matrix system of differentiating potential stakeholders based on criteria such as interests, influence, networks, and experience (Reed et al 2009). For this project, participants in the workshops had deep knowledge about some aspects of the land uses and socio-economic context of Central Queensland, and were connected to identifiable stakeholder groups (as listed in section 3)[2].

Besides a matrix method, another example of a stakeholder analysis is provided in Figure 4.2, where those with a right to decide may include the regulator, the land owner and the mining proponent (often the last two categories overlap), with other categories including larger groups of participants. As an

[2] Some writers focus on the dimension of problem definition (or the task confronting stakeholders) to determine who to involve and the type of engagement. This is particularly evident in the risk governance literature and distinguishes the types of engagement suitable for tackling simple challenges from those involving more complex trade-offs (IRGC, 2012) (see Figure 4.1).

earlier ACARP project has noted, "…the mine operator and regulators are stakeholders, but of a special order, in that they are also, respectively, applicant and arbiter. Thus, … in order to avoid conflict of interest both have the right to input on the process by which the evidence is obtained but should not take a position of influencing the outcomes of the process" (Minserve and CQU 2007, p. 9). Similarly, the broader public will be affected by some issues, and can be considered as a stakeholder in those cases, but most decisions about post-mining land use will have mainly local and regional consequences.

Figure 4.2: Hierarchy from information groups to decision groups

As Figure 4.2 suggests, there is a strong link between the level of stakeholder interest and the level of engagement of stakeholders and its purpose:

- Inform
- Consult
- Involve
- Collaborate
- Empower

These five categories are described in Table 4.3 showing that they differ in the degrees of 'voice' and empowerment of stakeholders. This follows the seminal work of Arnstein (1969) (see also Webler 1999). As Rowe and Frewer argue (2005), other typologies of engagement concentrate on other dimensions. These include the objectives of engagement (including decision-making, representation or information exchange); or the function they perform (ensuring more informed stakeholders, resolving conflicts or increasing confidence in decision-makers); and the structures they adopt (in terms of matters such as who is involved, how they interact and how often they meet). Devising stakeholder engagement in rehabilitation and closure so that mining leases will subsequently support productive activities such as grazing enterprises, requires consideration of all of these dimensions to choose between the plethora of forms of stakeholder engagement.

Multiple elements – objectives, functions, structures, problem definition and stakeholder empowerment – will influence the most effective model of stakeholder panel in given situations to

achieve the potential benefits of multi-stakeholder groups. Most of these are themselves multi-dimensional and have different implications for information management, legitimacy, and social dynamics as well as for costs and convenience. Key questions about panel dimensions that should be posed:

A. WHO to engage with: how representative to be and whether to seek the participation of affected local residents, technical experts, regulators, local authorities, industry and civil society;
B. WHY the group will operate – what its purpose, and brief should be in terms of objectives, issues, scale, scope and focus of their collective deliberations;
C. HOW to resource, structure and operate the group and reach and use decisions;
D. WHEN in the expected life of the mine (which can be decades) it is appropriate to involve stakeholders and what the timing of interactions might be; and
E. WHAT sequence of activities should the panel follow in working through the issues and options it identifies.

Table 4.3: Purpose and level of stakeholder participation in agreeing post-mining land use options

Option	Type of engagement	Description
A	**Inform** *[Can be passive e.g. leaflets, websites or press reports; or more active e.g hotline, public briefing, open day)*	Company uses in-house information and existing routines to formulate a rehabilitation and closure plan and informs stakeholders of it and the rationale
B	**Consult** *[Can be individually or in groups e.g. interviews, surveys, expert panel, field trip]*	Company consults with experts and selected stakeholders to internally formulate a rehab and closure plan and demonstrates to stakeholders how the input influenced the plan
C	**Involve** *[E.g. focus groups, advisory committee, options taskforce]*	Company dialogues with stakeholders to learn their values, preferences, concerns and constraints and demonstrates the ideas and suggestions they incorporate into the plan
D	**Collaborate** *[E.g. Interactive workshops maybe with presentations and exhibits; Appreciative enquiry; Delphi iterations; site inspections]*	Company dialogues with stakeholders to learn their values, preferences, concerns and constraints, incorporates as much as possible into the rehab and closure plan and then collaborates with stakeholders and takes their advice in implementing
E	**Empower** *[E.g. Consensus Conference, Delegated decision, Referendum]*	Company and stakeholders jointly plan rehab and closure on the basis of mutually understood values, preferences, constraints and concerns and work together to implement it sharing authority, responsibility and resources

(Adapted from Lawrence & Deagan, 2001)

A further series of questions, could feed a decision tree to guide formation of stakeholder groups to engage as per the options above. It is illustrated in Figure 4.3 with the rationale for the questions provided in Table 4.4.

Figure 4.3: Decision framework to align form and purpose of a stakeholder panel with operating context

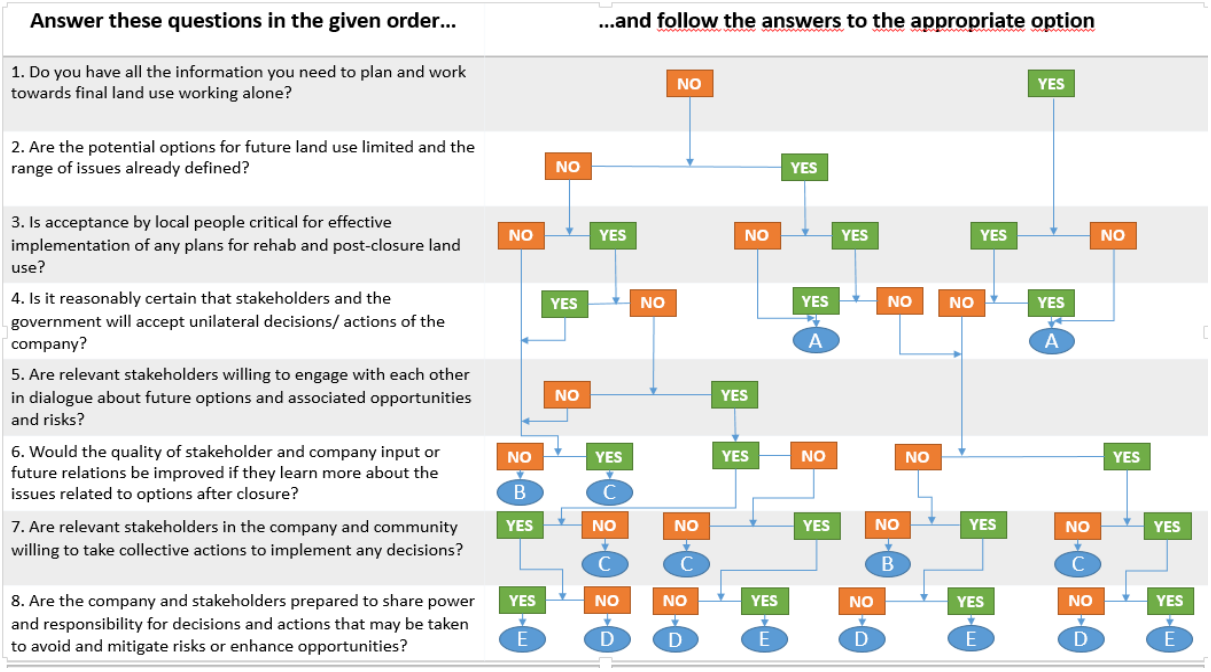


Table 4.4: Questions for stakeholder group formation

Question	Rationale/ principles (linked to theories of risk governance, SLTO and IAP2)
1. Do you have all the information you need to plan and work towards final land use working alone?	Complex or uncertain issues will benefit from an exchange of extensive and diverse information and perspectives.
2. Are the potential options for future land use limited and the range of issues already defined?	When there is uncertainty or ambiguity it is beneficial to consider multiple options
3. Is acceptance by local people critical for effective implementation of any plans for rehab and post-closure land use?	In situations of public resistance or criticism it is valuable to provide opportunities to influence
4. Is it reasonably certain that stakeholders and the government will accept unilateral decisions/ actions of the company?	Where the company has low trust, credibility and legitimacy it is important that others participate
5. Are relevant stakeholders willing to engage with each other in dialogue about future options and associated opportunities and risks?	When people / groups have divergent (or apparently incompatible) interests, values and goals a stakeholder group and social learning can facilitate the development of mutual goals and acceptable trade-offs
6. Would the quality of stakeholder and company input or future relations be improved if they learn more about the issues and options after closure?	Giving stakeholders an opportunity to be heard helps to develop 'relational capital' which has value beyond the short-term
7. Are relevant stakeholders in the company and community willing to take collective actions to implement any decisions?	Where conflict with or between stakeholder groups is not great and there is a will to integrate knowledge and values, a collaborative approach is likely to be effective
8. Are the company and stakeholders prepared to share power and responsibility for decisions and actions that may be taken to avoid and mitigate risks or enhance opportunities?	The risk-holder retains greater authority – to the extent risks are shared and mutual trust and respect prevails, authority is equalised.

Source: Adapted from Lawrence & Deagan, 2011

Sample models of engagement processes.

Various types of stakeholder panels have been used in Queensland for different resource management issues. Five well-documented models of stakeholder engagements currently being used in the mining/NRM sectors in Queensland are reviewed here with case studies provided:

- Community reference group (e.g. Rolleston Mine Community Reference Group)
- Special issue group (e.g. Glencore Groundwater and Environment Reference Group)
- Community consultative forum (e.g. Gladstone LNG Regional Community Consultative Committee)
- Expert reference panel (e.g. Fitzroy Partnership for River Health Expert Scientific Panel)
- Taskforce (e.g. Fitzroy River Water Quality Technical Working Group)

The questions about key dimensions and considerations in a stakeholder engagement process listed above are applied in Table 4.5 that summarises the case studies:

- WHO is involved: the number and sorts of people, and how they are appointed.
- WHY the panel functions: its purpose, brief or Terms of Reference.
- HOW the panel operates: resourcing, meeting structure and governance, chairing, agenda-setting and use of outputs.
- WHEN the panel operates: At what stage of mine life (or issue relevance), how often it meets, how long it operates etc.
- WHAT the key advantages, possible weaknesses and achievements of the model are.

Rolleston Community Reference Group (RCRG)

This example consists of an invited cross-section of community members (agriculture, business, local and State government, police, teachers), and each of the members serves a two-year term. Of note, the group membership is chosen by the mining company and not through an open invitation. There is a formal structure with minutes and meeting agendas that provide an opportunity for the group members to raise issues, hear progress reports, and inspect sites for rehabilitation progress. However, meetings are mostly an information sharing session rather than inviting opinions from the group members.

Meetings are usually held in Springsure, Rolleston, or at the mine site and attendance has tended to drop off over time. Rehabilitation issues are regularly discussed in the meeting but informed discussion of these issues required extensive reading of rehabilitation reports, which may have discouraged participation. As well, since the 2000s, the main opportunity for official community input on environmental management and long-term goals is the EIS public consultation stage (even for post-mining land use) and activities comply with the resultant environmental conditions thereafter. The group's influence on directions and behaviours is mainly in prompting company consideration of any issues that the group members raise.

Special interest group (a) Glencore Groundwater and Environment Reference Group (GGERG)

Rio Tinto's Clermont Mine was purchased by Glencore in 2014. GGERG was commenced during the Rio-Tinto operations period and has continued under the new operators. The GGERG focusses on landholders' special interests in groundwater. When the alternate water supply agreement (AWSA) was negotiated, this supported the group's focus and mandate. This is a forum for open and cooperative discussion where reports of community complaints, presentations and broad environmental issues are considered as well as specific monitoring and expert reports. The charter (ToR) was co-designed with landowners and has given stability through changes of ownership of the mine. This stakeholder engagement panel consists of an independent chair and eight members. Members of this committee

attend on a unremunerated, voluntary basis for a two year term, however the independent chair is paid by the mining company. The main purpose of the committee is to deal with underground water quality monitoring, and ensure independent results and recommendations to the industry and the regulators. They meet quarterly and their charter guides relationships with the industry (through the mine managers) as well as within themselves. The main tasks of the chair are to ensure transparency in operation, establish trust and foster a positive relationship with the community.

Special interest group (b) Ensham Mine – Voids/ Nogoa River Floodplains

Ensham mine's group was established as a community reference group in response to the regulator's requirements for a 2 year process to determine the best options for final voids. More recently it has decided to narrow the name and scope to ensure that the focus issues are prominent and that the group addresses the issue of what to do with the voids upon completion of mining. This group has about 10 members with and most of the group members are the neighbours of Ensham Mine. The group has an an independent (remunerated) chair, a formal terms of reference and a two-year technical study program for best end-use of the land (voids). The group has access to expert studies but also, the group's technical study must include engagement with stakeholders. Minutes of the stakeholder group need to go to the regulator.

Gladstone LNG Regional Community Consultative Committee (RCCC)

This group involves a cross-section of key sectors in Gladstone to manage the social and economic issues caused by new developments. It was initially required by the Coordinator-general's department as a part of EIS conditions during construction of the three LNG plants, but has been continued since as a forum by the three LNG companies. Membership is invited and representative of key sectors. Members are voluntary/ unpaid – including an independent chair. Meetings are formally managed, and minutes are publically available. Interest of members from some sectors has fluctuated as issues change, e.g. the agriculture sector was involved during construction phase when pipelines were being laid. Now, in operations phase, it is more issues like training and air quality that are the focus. The Committee has provided a forum where different sectors have been able to raise issues as well as receive updates and responses from the LNG companies. The Committee identifies the key issues for focus between meetings.

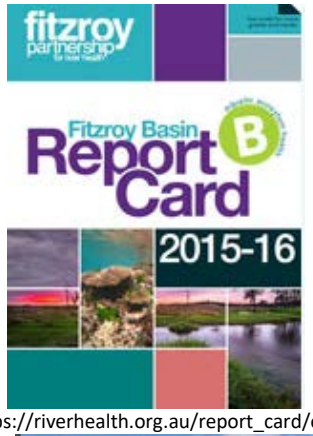
Expert Advisory Panel: Fitzroy Partnership for River Health's Expert Scientific Panel / Gladstone Healthy Harbour Partnership Independent Science Panel

Science panels or expert panels are typically used where there is need to handle technical information and provide technical advice; they are also used when there is a need to demonstrate independence and build community trust. Expert panels are usually funded by State government and industry and sometimes by local government. Typically expert panels may involve both local and outside experts, and commission and organise independent assessment and research. Consequently there is greater need for financial and technical input. The focus of an expert panel can be narrow (i.e. a single task or issue) but the scope can also be broader.

In the two cited examples, the technical panels operated in conjunction with tri-sector partnerships of industry, government and community groups, where the technical panels prepared work for and reported to the relevant partnership. While the partnerships were responsible overall for the relevant report cards, the science panels are responsible for ensuring that the report cards are accurate and underpinned by rigorous science.

Taskforce: Fitzroy River Water Quality Technical Working Group

A taskforce, inquiry or working group can be used to drive major changes in policy or resource allocation, or to investigate a particular issue. These are typically set up by government and report to government. While government may still hold the power to make decisions, a taskforce/inquiry/working group will normally be charged with conducting a body of work and developing particular recommendations for government to consider – often within a defined timeframe. A taskforce usually includes representatives from government, industry and community groups, but at regional or state levels rather than at local levels. For example the Fitzroy River Water Quality Technical Working Group involved a cross-section of representatives from government, industry and community, and was focused on managing the issue of mine water discharges and impacts on water quality in the Fitzroy. The recommendations of the group went to the Queensland Government and the relevant government agencies to help set policy in this area.



https://riverhealth.org.au/report_card/ehi/

https://www.shell.com.au/about-us/

https://www.idemitsu.com.au/projects/ensham-rv-community-reference-group/

http://www.glencore.com.au/en/publications/fact-sheets/FactsheetsGCAA/GCAA_Fact%20Sheet%20-%20Final%20Void_WEB.PDF

Table 4.5: Summary examples of select models of stakeholder panels

	Community Reference Group e.g. Rolleston Coal CRG	Special Issue Group e.g. Glencore Groundwater and Environment Ref. Group (Clermont)	Community Consultative Committee e.g. Gladstone Regional Consultative	Expert advisory panel e.g. Fitzroy partnership science panel	Taskforce e.g. Fitzroy River Water Quality Technical Working Group
WHO? Membership Type How appointed? Number and sorts of people to include	Invited reps of stakeholder groups Landholders and neighbours	Representatives of those influenced by or able to influence actions and decisions about the issue Landholders (2); Community (4); Company (2) Agforce(1) Landcare (1) Regulator (~2)	Representatives of a cross-section of sectors for two-year terms Company (3x 2) Community (12) Social service (3) Regional (3) Economic (2) Indigenous (1) Environment (1) Local Gov'nt (1) State Gov (1)	Appointed 'experts' Key fields / knowledge groups 7 – 9 independent specialists (academics, researchers, prominent people in relevant institutes / organis'ns	Appointed/ volunteer key actors – usually Senior government officers as steering committee Representatives re regional/state Regional (3) NRM (1) Industy (4) (Indigenous (1) Environment (3) Local Gov'nt (4) State Gov (Health)(1) Sunwater (1) CQUniversity (1)
WHY? The 'purpose', or brief of the panel? And the Scope of the panel: Issue specific or general? Site-specific or regional?	General issues, site-specific. Regular information exchange and discussion of issues of community concern; facilitating distribution of infor about the mine's work and plans	Specific issue and site-specific. To manage issues of specific concern, provide a forum to raise questions and provide technical information	Initially specific issues and region-wide . Two-way information sharing between the Gladstone community and 3 LNG companies. Special focus on cumulative impacts. Identification of issues and opportunities impacting the community.	Issue specific – whole harbour or catchment focus. Guides the development of the report card, reviews reports and activities of Partnership. Provides science advice and quality assurance to the Partner Network	Issue-specific; Catchment focus Specific problem solution. In this case study and make recommendations about cumulative impacts of mining activities on water quality in the Fitzroy Basin.
HOW? Resourcing; Meeting structure and governance of panel; Decisions	Convened by company	Independent Chair, formal meetings with agenda and minutes (publicly available). Expert advice and presentations	Independent Chair Minutes publicly available. Guest speakers.	Independent Chair, Resourced by tri-sector partnership. Funded for technical and expert advice	Chair from government, funded by government. Department staff provide technical support
WHEN? At what stage, how often and for how long to operate?	Several meetings per year over expected life of mine ~15 years	Standing committee with quarterly meetings	Standing Committee throughout 6 years phase of construction	Standing committee – Meets usually 3- 5 times per year.	Time limited – about 9 months. Usually with intensive period of meetings at short intervals
WHAT? sequence the panel follows to work through options	Identifies relevant issues and information needs	Identifies issues, expresses views, requests expert info and manages issues	Identifies issues, expresses views	Identifies issues, provides expert advice and technical consolidation	Identifies issues, solicits expert information and makes recommendations

Positive features endorsed in examples include:

- Groups that have a mandate (especially a legally binding requirement) are taken seriously – e.g. the mine has interrupted production on GGERG 'advice'.
- Key to longevity is giving landowners a stake and achievements to take pride in (e.g. the Alternate Water Supply Agreement for GGERG)
- Importance of company being transparent and open as a basis for mutual trust and respect
- Ability to access independent reports and build trust in scientific reports produced by company
- Purpose and focus adapting over the life of the mine as key issues shift
- Formal governance models with ToRs, minutes, agenda and clear membership criteria foster positive relationships.

Observed potential limitations of some models:

- Limited decision-making power if the mine and the regulator will not change any plans or procedures as a result of the group's deliberations and decisions.
- Lack of clarity about when consultation in such groups about future land use should happen: during operations and/or when mining is coming to an end
- If poorly run, reference groups can serve as a 'tick and flick' exercise with little influence and few opportunities to challenge and tackle key issues
- Some individuals end up over-consulted and over-referenced.

The issue of models for engaging stakeholder panels is the topic of attached Report 3.

4.5: Assessing the convergence of stakeholder views on post-mining lands uses in the Bowen Basin

It has been noted that there are challenges in moving to a more consultative model with empowered stakeholders. One of these relates to the extent to which diverse stakeholders' views will converge to present an 'agreed' view about post-mining land uses that is accepted as legitimate by the regulator and others. Therefore, an important focus of this research, as reported in this section was to determine if there was significant disagreement between stakeholders and significant differences in stakeholders' views on relevant issues associated with post-mining land use across sector groups as a precursor to understanding the potential for dialogical group processes to generate a convergence of views.

To identify attitudes of various groups that could be involved in a stakeholder consultation process and assess if there were large variations in attitudes towards mine rehabilitation and closure issues between the groups, data were collected from a sub-sample of participants in the workshops (n=26) on a range of relevant questions. The questions were generated from the initial stages of the project, drawing in particular on the results of Maczkowiack et al. (2007) and the interview outcomes to identify questions of relevance. The data were collected by direct questionnaires in Workshop 1 (14 respondents), a web-based survey after Workshop 2 (6 respondents), and another web-based survey after Workshop 4 (6 respondents). Responses were collected from six different stakeholder groups:

- Business sector (2 respondents)
- Landholders (6 respondents)
- Mining (5 respondents)
- Conservation (3 respondents)
- NRM (7 respondents)
- State Government (3 respondents)

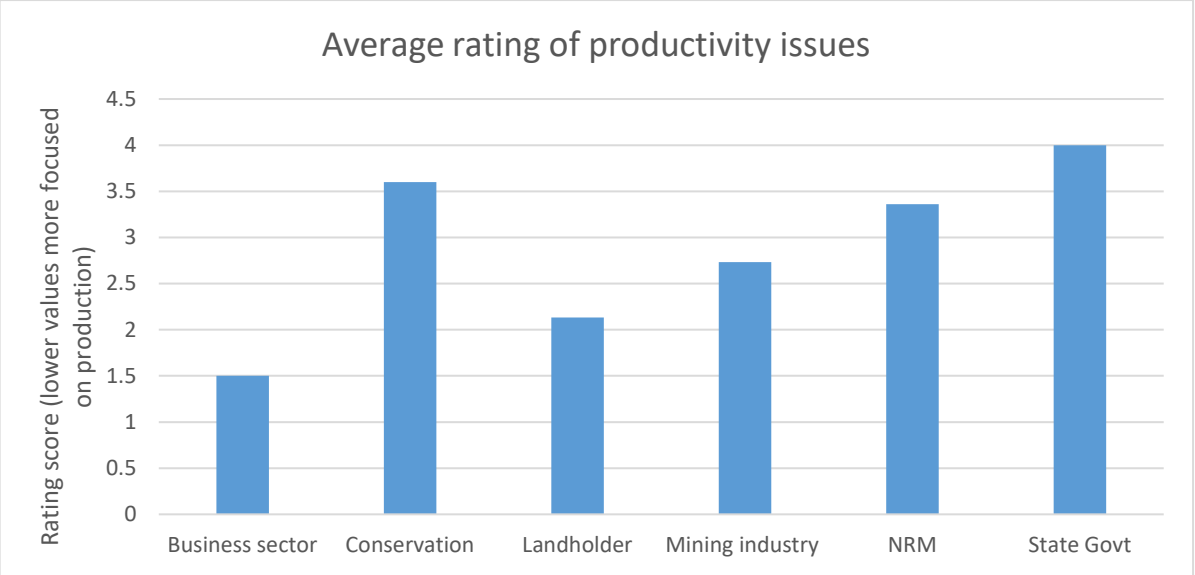
Only the most relevant summary data and statistical tests of differences are reported here; full details including summary responses to each question discussed are provided in Report 4.

The responses to individual survey questions gave little indication of major or systematic differences the extent to which stakeholders and stakeholder groups have different views about issues associated with post-mining land use. The small sample size (typical of working with a stakeholder group) limits the ability to test this across questions. However, tests can be conducted by combining results of different questions. Graphical summaries of the variation in views between stakeholder groups are summarised in Figures 4.4 and 4.5 for productivity issues and rehabilitation issues respectively.

Productivity issues

The three questions on productivity-related issues in the study have been pooled together, as responses were roughly ordered by trade-offs between increasing productivity or other factors such as native vegetation and ecosystem protection. The results in Figure 4.4 show that the differences in responses are limited, with the business sector placing most emphasis on productivity and the State Government sector placing the least emphasis.

Figure 4.4: Average rating of productivity questions by stakeholder groups



Statistical tests identified that approximately one-third of the comparisons between the sectors were significantly different (ANOVA F test = 6.122, significance = 0.000). Tukey post-hoc tests identified significant differences in the responses between:

- Business and conservation sectors
- Business and NRM sectors
- Business and State Government sectors
- Landholder and NRM sectors
- Landholder and State Government sectors.

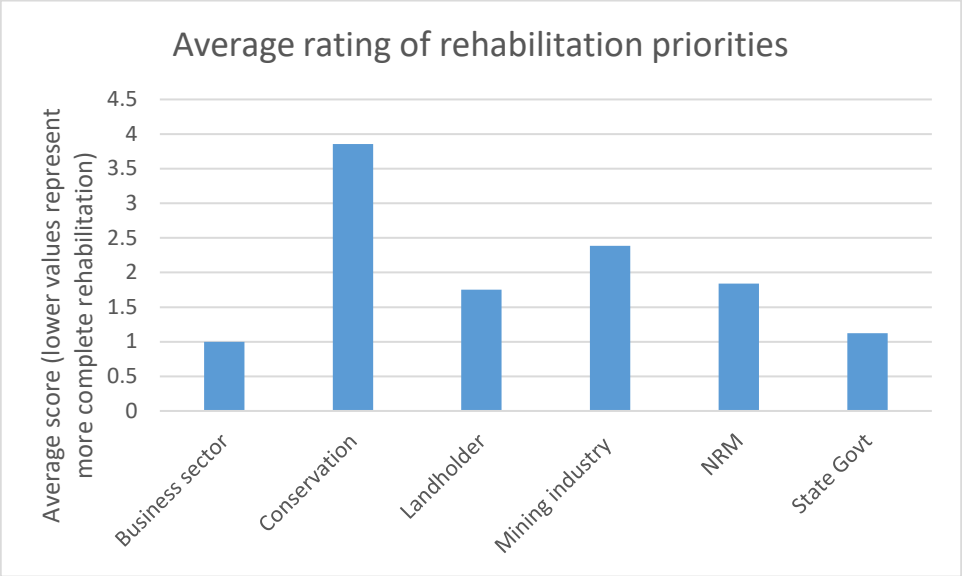
There were no significant differences in responses between the mining sector and other sectors.

Rehabilitation issues

There were also three questions on rehabilitation priorities in the study that have been pooled together, as responses were roughly ordered by trade-offs between maximum rehabilitation through to minimal rehabilitation. The results in Figure 4.5 show that the differences in responses are limited, though the

conservation sector had very different responses to other sectors (members of this sector tended to emphasise 'other options' for rehabilitation goals). Responses from the other sectors appear to have some similarity (particularly the Landholder, Mining and NRM groups). We note that participants from the mining sector tended to work in the mine rehabilitation space rather than in production, so their opinions may not have been fully representative of the mining sector.

Figure 4.5: Average rating of rehabilitation priorities by stakeholder groups



Statistical tests identified that approximately one-third of the comparisons between the sectors were significantly different (ANOVA F test = 4.475, significance = 0.002). Tukey post-hoc tests identified significant differences in the responses between:

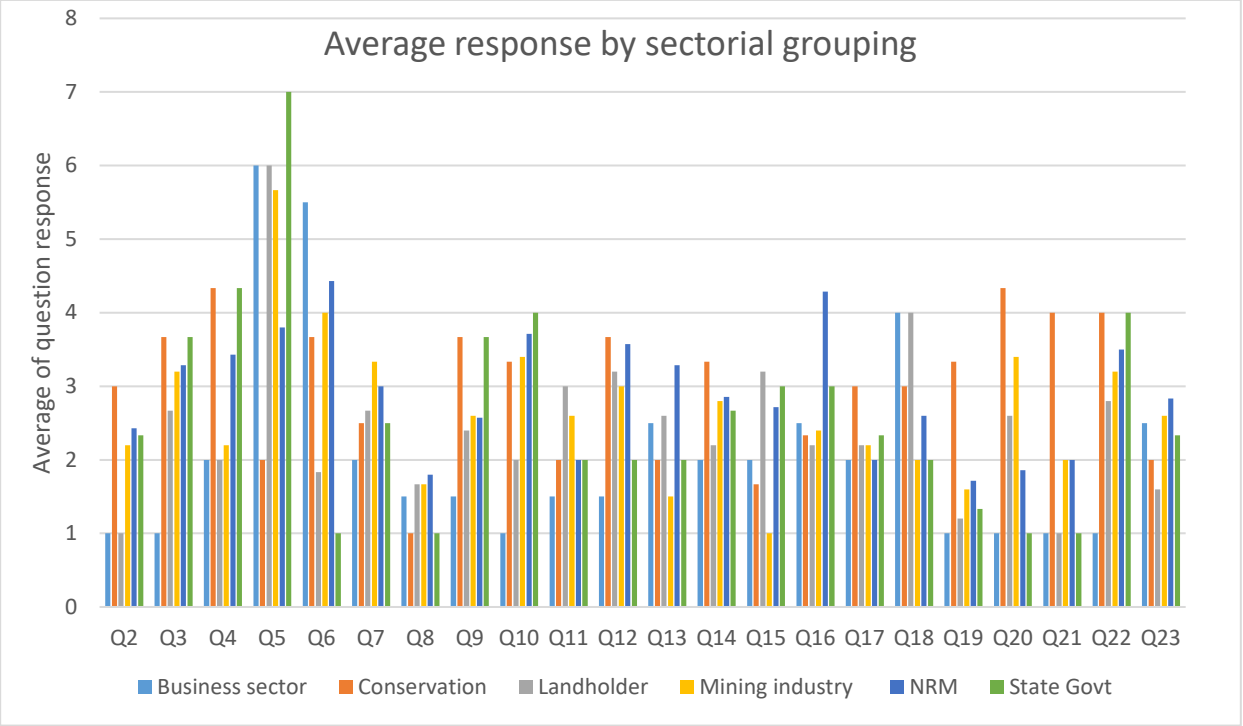
- Business and conservation sectors
- Conservation and landholder sectors
- Conservation and NRM sectors
- Conservation and State Government sectors

There were no significant differences in responses between the mining sector and other sectors.

Full survey

The same analysis can be extended to the full survey, covering both ordinal and nominal data, to identify if there are significant differences in responses across stakeholder groups. A summary of the average answer by sector is provided in Figure 4.6.

Figure 4.6: Average rating of all questions by stakeholder group



In statistical tests, approximately one-third of the comparisons between the sectors showed significant difference (ANOVA F test = 4.184, significance = 0.001). Tukey post-hoc tests identified significant differences in the responses between:

- Business and conservation sectors
- Business and NRM sectors
- Conservation and landholder sectors
- Landholder and NRM sectors

There were no significant differences in responses between the mining sector and other sectors.

Most importantly for this research, no statistical differences in views could be identified between representatives of the mining sector and the pastoral sector, indicating potential to generate agreement about post-mining land uses. The limited variation in views across different sectors also provided a baseline case for engagement and planning processes to develop consensus positions with deliberation resulting in generally acceptable solutions.

Full survey data including summary responses to each question are in the attached Report 4.

4.6: Assessing how a workshop process can create shared views of post-mining land use change.

Few of the studies of mine closure planning and post mining land use have considered landholders' engagement in ex-mine land use decisions. Factors that may influence graziers to takeover ex-mine land once it has been rehabilitated and relinquished are rarely investigated (see section 4.1). Similarly there is little questionning of how would they can engage and with what capacity (see section 4.3). The widespread endorsement of participatory approaches and stakeholder engagement in closure planning does not mean there is consensus about effective ways of doing that. Variations in who is involved, how many participants, the value of using concrete versus hypothetical examples, and other issues

characterise the many strategies that have been adopted, most of which warrant consideration under particular circumstances. These approaches include citizen's juries, reference panels, stakeholder advisory groups, focus groups, field days, surveys, action research and participatory monitoring (Carson & Gelber, 2001; Harding & Macdonald, 2001; Solomon, 1999).

Fundamental to a number of these techniques, including reference groups, participatory advisory committees and stakeholder panels, is group deliberation about shared information and a range of viewpoints. This is argued to be appropriate for decisions with wider public good implications and also to "*induce participants to assume a longer-term and more socially-oriented position*" (Bunse, Rendon, & Luque, 2015, p. 90). Group situations are also deemed to facilitate stakeholders' learning from one another and to provide the basis for understanding landscape-scale effects and intersections with policy decisions by considering the perceptions of groups of landholders in aggregate.

This part of the study adopted a qualitative methodology, involving a hypothetical post-mining land use exercise particularly in two of the four workshops with significant landholder participation. The focus of these workshop exercises was to:

- Identify the factors that participants thought were important in deciding land uses
- Test how a group decision process could be used to generate agreement
- Identify post-mining land uses that a cross-sectional group would support.

The essential features of the process implemented were:

(a) Inviting participation by a diverse group of stakeholders
(b) Utilising a hypothetical case illustrated with visual images as a stimulus or 'boundary object'[3]
(c) Facilitating an open discussion of the hypothetical case
(d) Encouraging participants to draw on their varied expertise to consider both risks and opportunities
(e) Discussing and synthesising to generate shared agreement about potential land use changes.

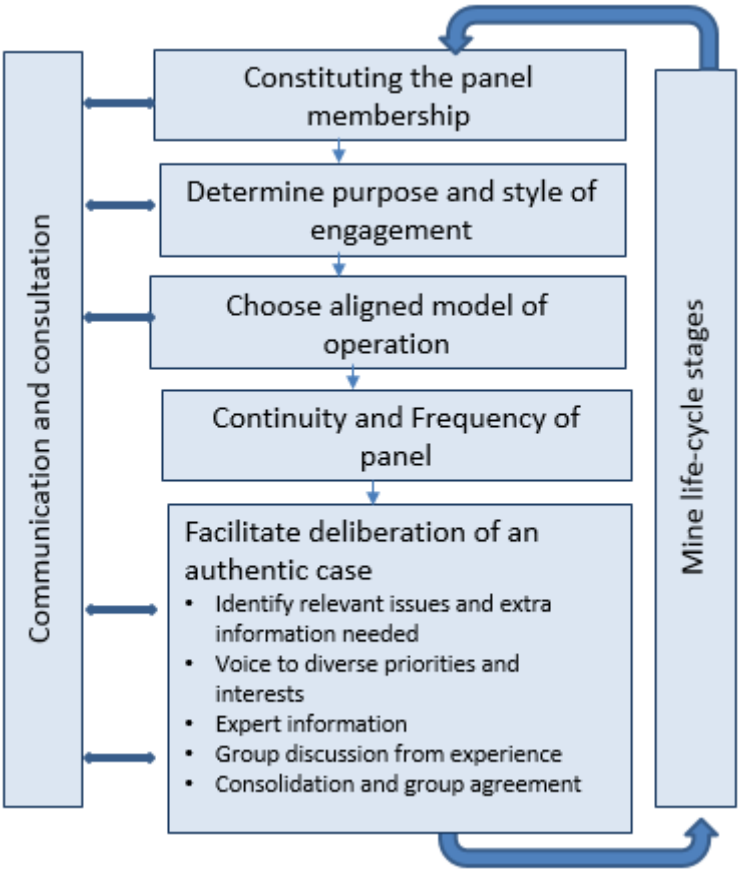
The process used across the workshops involved six elements of facilitated deliberation:

- Identify relevant issues and areas where extra information is required (Workshop 2)
- Hear the range of priorities and views (Workshop 2)
- Provide requested specialised (expert) information to the group (Workshop 3)
- Undertake group planning exercises for post-mining land use change (Workshop 3)
- Technical consolidation and synthesis (Between workshops 3 and 4)
- Confirmation that the final plan met stakeholder approval (Workshop 4).

These elements and process are evident in Figure 4.7.

[3] A 'boundary object' may be abstract or concrete. It may be interpreted differently by various peoples or groups but has commonalities that are recognised by all and allows meaningful collaboration and communication.

Figure 4.7: Steps and decisions involved in constituting and operating a workshop-based stakeholder panel



The two relevant workshops (Table 4.6) were conducted in April and June 2017 in Blackwater.

Table 4.6: Post-mining land use workshops: participants, focus and methods

	Participants	Focus	Methods	Expert Input
Workshop 2 (Landholders) • 27th April 2017 • Total attendees = 17 (including 4 researchers)	Individual model (mostly neighbouring landholders)	Site issues to convert back to ag. use, individual responses with 'mock mine map'	Individual exercise on planning for mockup case study and open forum, with issues emerging from discussion	Participants, including ACARP Monitor
Workshop 3 (Landholders and Stakeholders) • 1st June 2017 • Total attendees = 25 (including 4 researchers)	Both landholders and sectoral representatives invited	Site issues to convert back to agricultural use, group responses with 'mock mine map'	Expert information, and group exercise on planning for mockup case study with discussion building on issues raised in previous workshop	ACARP monitors, EHP staff, summary of technical information

Source: Prepared by the authors

Workshop simulation exercise

During Workshop 2, the first workshop concentrating on landholder perspectives, participants were presented with aerial views of two adjoining mining leases with a combined total area of a little over 26,000 hectares (see Figure 4.8). Around half of this area is un-impacted 'buffer' zones, while the low impact areas (such as roads, railways and industrial sites plus the areas of significant disturbance such as the pits, spoil heaps and tailings dams total almost 11,000 hectares. Participants also viewed a series of more detailed images (e.g. Figure 4.9) of the following disturbance features evident on the overall view:

- Void – overall, high-wall and low-wall.
- Ramps
- Subsidence area (related to underground operation)
- Rehabilitated box cut spoil (recent, 5 years and > 10 years since establishment)
- Tailings dams with various levels of treatment

Figure 4.8: A hypothetical mine with typical domains used in the first landholder workshop

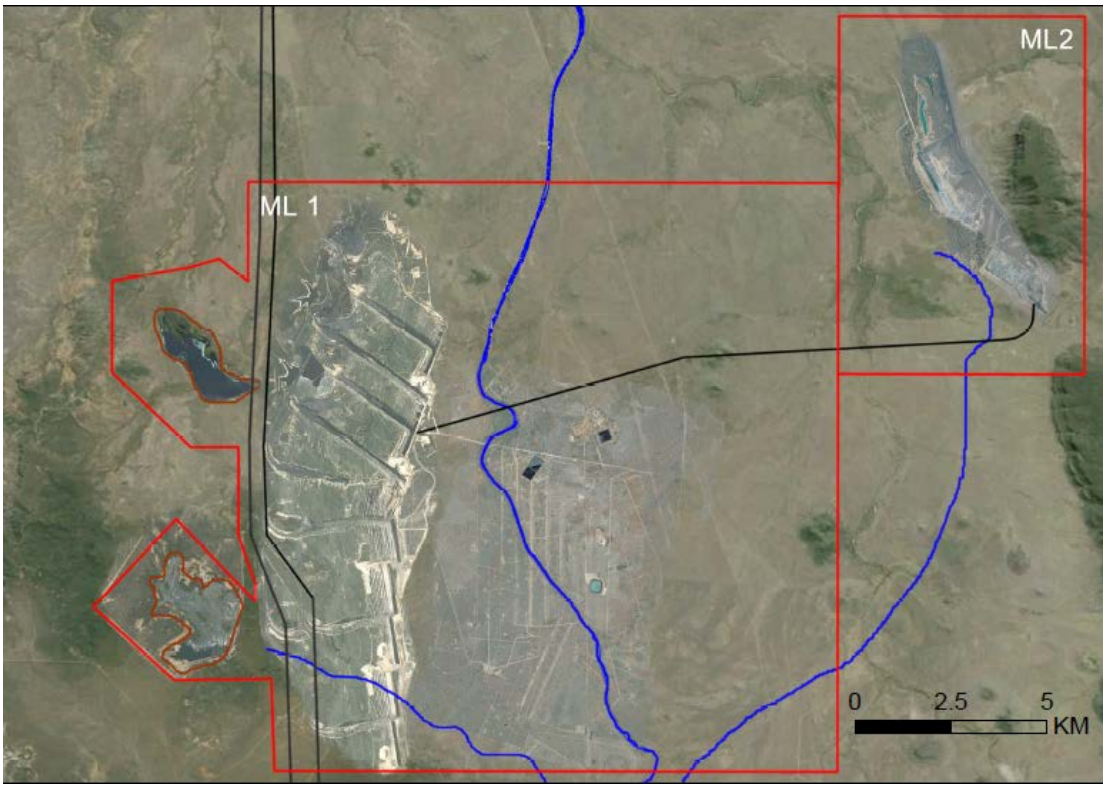


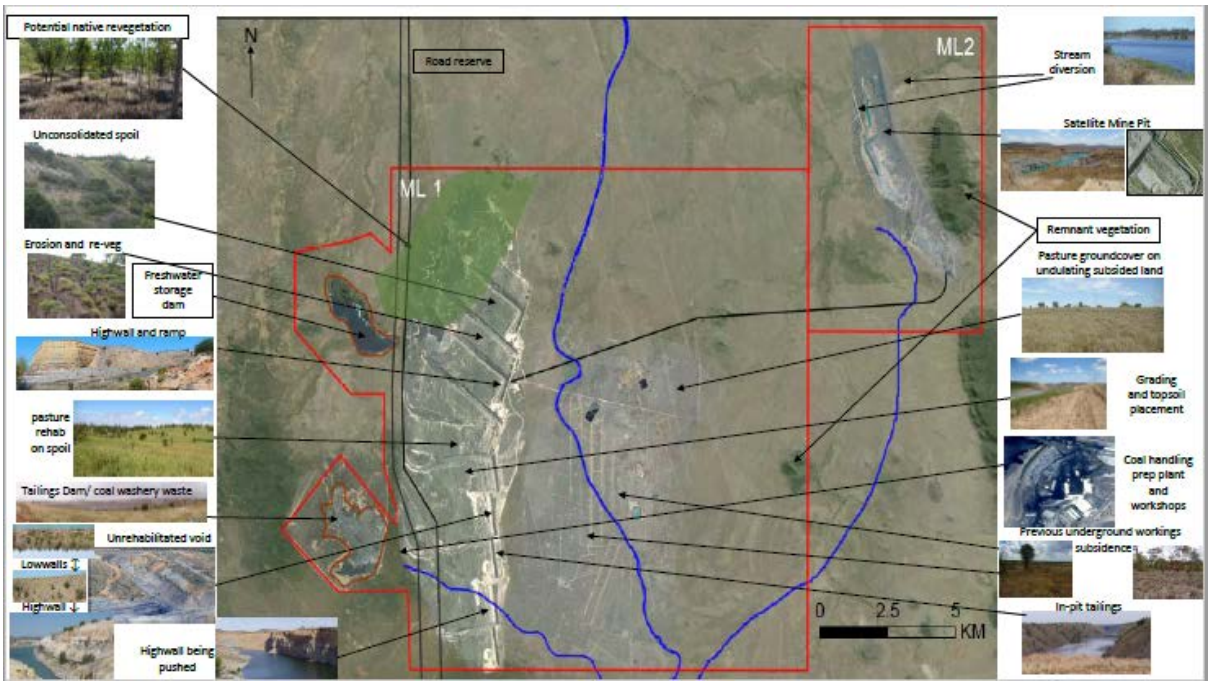
Figure 4.9: Sample image- Void with highwall being pushed

Source: S. Henderson

Participants were asked to envisage this was a property in close proximity to their own which was coming to the end of its mine life and seeking to transition to grazing as the post-mining land use. They were then invited to identify how they would design the final land uses for the site if they were the future owner or neighbour drawing on past observations and experience of possibilities.

During Workshop 3 (the second landholder workshop) each group again worked with the same hypothetical mine site however, this time the maps were annotated with thumbnails of the features rather than those images being disconnected from the aerial view map (see Figure 4.10).

Figure 4.10: Hypothetical mine with typical domains identified used in the second landholder workshop



Summary of the findings and key lessons from the workshop

The majority of the stakeholders involved in the two landholder workshops were in favour of transferring the mining land into grazing land with a mosaic that included some biodiversity and conservation options. There was general agreement that:

- Developing a (viable) grazing enterprise would be possible,
- Not all areas need to be grazed (i.e., some environmental objectives could also be achieved) and
- There needs to be some commercial value to a large part of the property.

There was more diversity of opinion about the extent to which different domains could be used, for example some participants had reservations about using spoil areas as grazing land. Some of this diversity was driven by variations in perceptions of future risks associated with different domains and land uses. The workshop participants generally agreed that a due diligence process is required before transferring the land use and ownership with transparent and trusted scientific assessment required on tailings dams, water quality, soil quality, slope and vegetation. Clarity is needed about:

- Who will monitor,
- Who bears responsibility,
- Mechanisms to cover unexpected events and residual risks,
- Careful management by the subsequent land user and any constraints on them, and
- Role of the government departments (who would probably need to do the due diligence).

There was agreement in the workshops that landholders should be part of the decisions about processes and standard of land use transfer. Specific examples noted were:

- It is important for mining companies and landholder(s) to talk together, particularly about enterprise level decisions (e.g. placement of fences and water sources)
- Some decisions are likely to require an individual land manager's judgement (as opposed to a group assessment)
- Specific risk areas and residual risks on a block of land need to be negotiated with the future owner.

Individual Assessments of the Hypothetical Mine Map Exercises

In the first of these landholder workshops, participants were asked to develop their own plans for post-mining land use using a standard 'mockup' of a mining lease. Their overall challenge was to develop an effective way to use the post-mine land package.

There was substantial variation in the ideas and land uses suggested, although similarities in the identification of key domains. Figure 4.11 shows an example of the most detailed individual map as well as a summary of the individual maps generated at the workshop.

Figure 4.11: (Left) An individual stakeholder's post mining land use options; (Right) Summary of individuals' post-mining land use options (each colour represents a different individual)

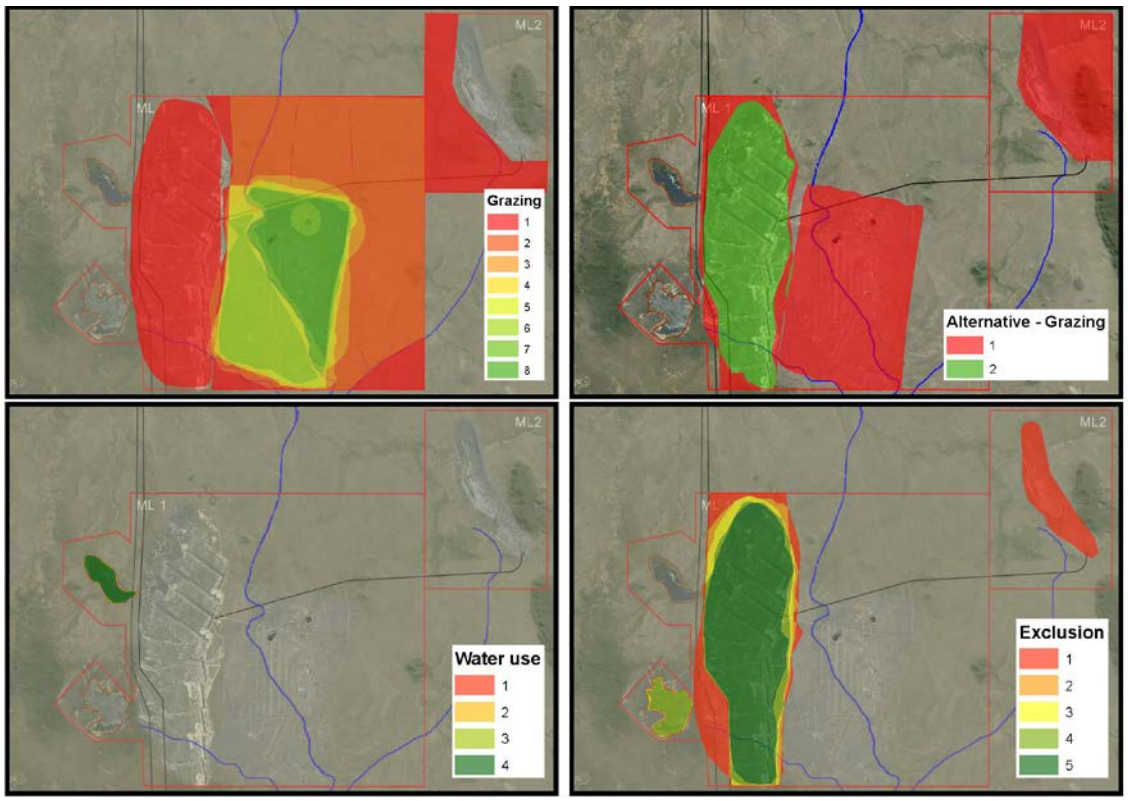
The level of agreement about different management of the mine domains is summarised in Figure 4.12 which depicts (moving clockwise from top left) the number of individuals sharing views about which areas to graze, to use for an alternative to grazing, to fence out or exclude and the use as a water source.

Figure 4.12 shows that there was:

- Limited interest in grazing open pit and spoil areas (only 1 of 8 landholders would graze)
- General agreement about grazing longwall subsidence areas (at least 5 and up to 8 out of 8 grzing part of this)
- Some suggestions of alternative use to grazing (2 out of 8 landholders for spoil areas)
- General agreement about use of fresh water reserves (all agreed these were valuable)
- Majority agreement about excluding the tailings dam (4 out of 5), the main open pit and spoil area (5/5) with a suggestion that the satellite pit be excluded too (1/5).

Participants' explanation of their preferences revealed the issues and concerns that were significant to them and the risks and opportunities they envisaged for a future manager of this property. They also highlighted individual expectations about productivity of the land and how they would manage the property.

Figure 4.12: Level of agreement for individual post-mining land use maps (showing number of participants designating a specific use for various domains).

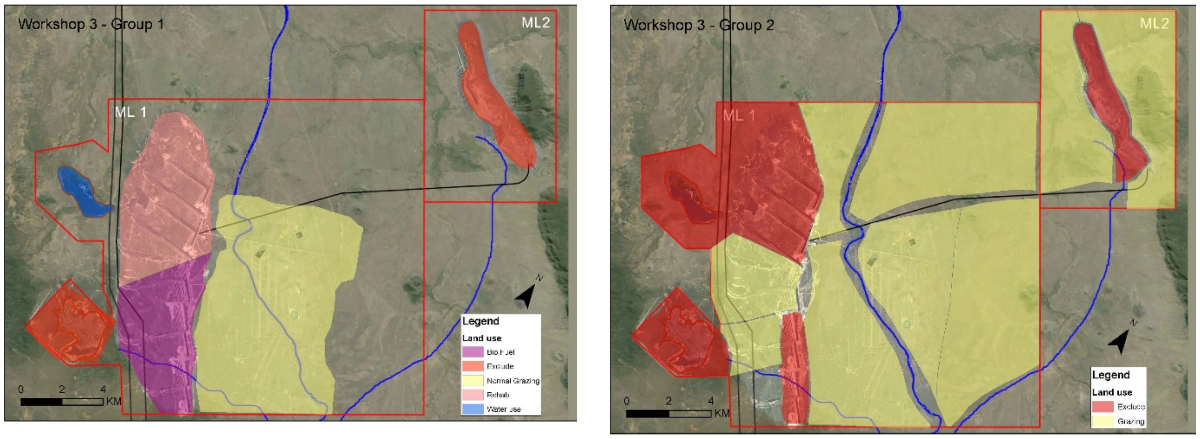


In the next landholder workshop the 'mock mine' map exercises were repeated, but this time participants were grouped into four panels of 5 people, with members in each panel from a cross section of interests. Each of the four groups had to identify their preferred post-mining land use and mark it on the map (Figure 4.13). The intent of the group exercise was to identify whether group processes could generate greater consistency in planning than individual assessments. It was also a test of the extent that similar groups could generate similar answers. Each group was similar in size and composition to the stakeholder groups recommended by Owen and Middlin (2010) for assessing rehabilitation, so this test of consistency is very relevant.

Three of the four groups completed the exercise, while one group did not reach enough agreement to be able to provide results at a summary level. Results from the group mapping exercise indicate:

- Group assessments tended to be more thorough and detailed than individual assessments
- There was more focus on landscape level issues than in the individual assessments
- There was still considerable divergence in proposed land uses between the different groups
- The issues that were important to each group varied, and appeared to be driven by the interests of individual members

Figure 4.13: Post-mining land use options of two separate groups

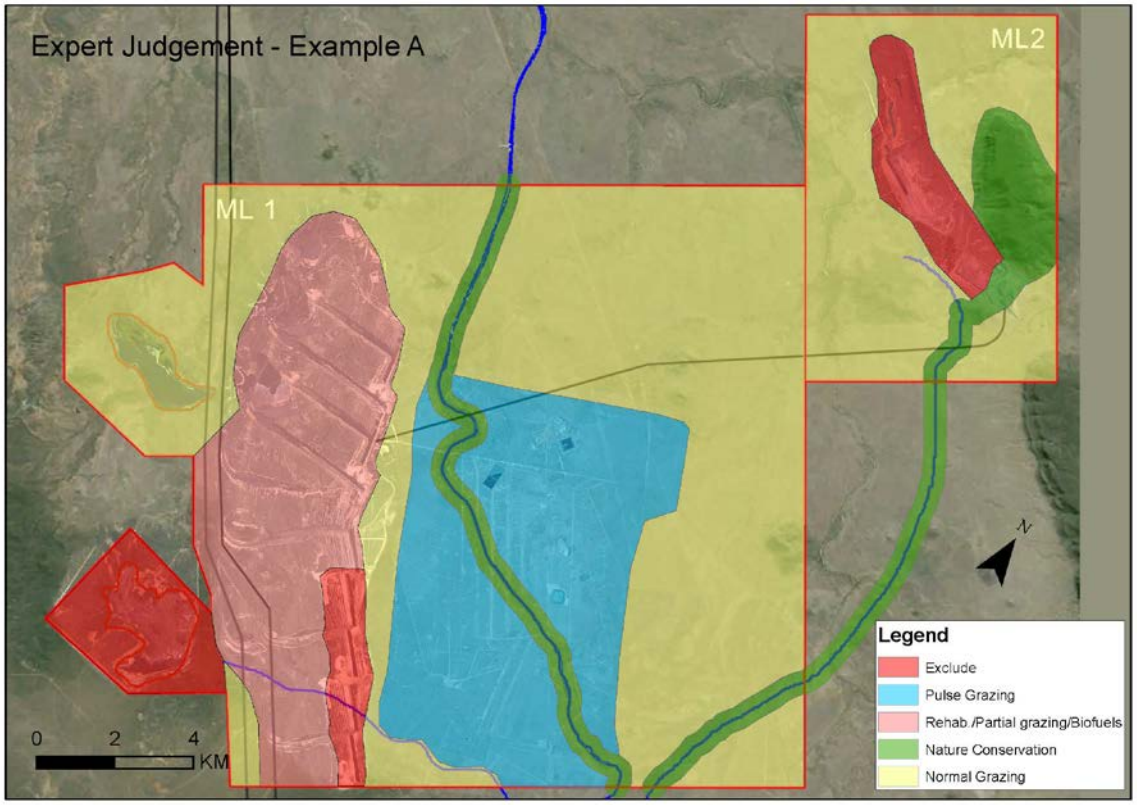


The group exercises generated more detailed planning than individual exercises, and were also successful (in three out of four cases) in reconciling the various inputs from different stakeholders. Yet the groups generated very different outcomes, suggesting that the results of a planning exercise may be dependent on the membership and composition of a group; i.e. different stakeholder groups may generate different plans. The group planning exercise indicated stewardship concerns that were not always related to the mining impacts. For example, one group excluded the fresh water dam, riparian corridors and an area of regenerated bushland from grazing.

One limitation of the group workshop process is that it was difficult to generate the iteration process where a group could reconsider a planning exercise with additional information. To account for this a desktop exercise was undertaken to identify how the group exercises could be reconciled, in anticipation of a joint workshop setting where the groups had to agree on a common outcome. This selects the most cautious outcome from each group for each domain, assuming that if the groups had to negotiate a combined outcome that they might be more inclined to agree about areas to exclude rather than specific uses of productive areas. This is consistent with an Expert Panel approach or technical consolidation, where members would set broad directions and then technical staff synthesise these suggestions to provide draft plans for further consideration (Figure 4.14). Under this approach:

- the un-mined land would continue to be grazed as normal,
- some areas would be re-established to biodiversity,
- there would be controlled/pulse grazing on underground mined areas,
- some spoil and pits and the tailings dam would be excluded from grazing, and
- some spoil areas would be rehabilitated for limited grazing, bush, or alternative agricultural use.

Figure 4.14: Technical consolidation of post-mining land use based on groups exercises



The results of this exercise demonstrate the power of consultative processes to generate shared agreement about post-mining land uses across a diverse range of different stakeholders. The workshop exercises with a 'mock' mine site for conversion to post-mining land uses represents five different stages in consultation and agreement:

- Identifying issues and extra information needed
- Generation of diverse individual views and suggestions
- Harnessing of expert information
- Negotiation and sharing of experience within small groups to develop shared understandings
- Refinement of possibilities with expert synthesis to reach final agreement.

5. Conclusion

This project has demonstrated how stakeholder involvement in post-mining land use change planning can be used to identify relevant issues and to negotiate outcomes that would meet with community approval. Key findings of the project can be summarised into issues around post-mining land uses and issues around engagement processes.

Summary findings about post-mining land uses:

There were largely consistent views among stakeholders that some form of grazing was the most suitable use of post-mining lands in the Bowen Basin, although there some suggestions for differing uses and variations in opinion about the productivity of rehabilitated lands. Workshop participants anticipated that mining lands could be returned to 'patchwork' uses with some areas productive and some not, to generate mixes of ecological, social and economic functions. Areas of native vegetation on mining lands should be incorporated into grazing properties. Planning for post-mining land use and engagement with future users should begin early rather than being left till the closure stage.

A number of considerations relevant to transferring mining land to grazing were identified by stakeholders. Key issues included potential risks of maintaining rehabilitated lands and financial liabilities of any failures. Identifying who bears any residual risks and who is responsible for managing and monitoring the sites and any contaminated areas were seen as important, as was the responsibility for maintaining any remaining infrastructure on sites. Factors that would make sites more attractive included the productivity of rehabilitated lands, the extent to which other lands are included in a parcel, and the standard of infrastructure, layout and access to an area.

Key findings about process:

Widespread support for stakeholder and community involvement in planning for post-mining land uses were identified in the workshops. Benefits of engagement that were nominated included:

- Harnesses diversity of knowledge and values
- Provides transparency and increases quality of decision processes
- Flexibility, encouraging innovation and adaptation to dynamic situations
- Improves negotiation and decreases conflict between competing interest groups

The use of a structured process to engage stakeholders, such as through some form of a representative panel, was widely supported. It was noted from the workshops that ideally engagement begins early and continues at intervals throughout life-of-mine to allow considerations of community preferences alongside technical and scientific issues. Stakeholders to be involved should be a diverse cross-section of predominantly local people affected in some way as well as those with locally valued expertise. Group deliberations focussed on an authentic case and resources to draw on a range of expertise should play a major part in the process.

There are a number of different models of stakeholder engagement that can be developed for post-mining land use planning. A guide to identifying the type of engagement process that is suitable to the situation has been provided through a decision tree flowchart and associated materials, while steps and decisions involved in constituting and operating a stakeholder panel have also been provided. The roles of a stakeholder panel include:

- Enhancing mutual understanding,
- Identifying relevant issues and extra information needed
- Give voice to diverse priorities and interests
- Harnessing requested expert information
- Managing group discussions drawing on experience and expertise
- Consolidation of views and group agreement
- Facilitating consensus and compromise.

The study highlights that planning for post-mining land use can be achieved through group processes involving landholders and other stakeholders. It shows that both technical assessments and socio-economic insights from local stakeholders add value to planning for transition of mining leases to an agreed and productive post-mining land use. In particular, it proposes:

(a) Appropriate and effective ways to engage stakeholders and communities in post-mining land use decisions
(b) The extent to which an engagement and consultation process with key stakeholders can lead to a convergence of views and agreement about post-mining land use and suitability of rehabilitated mining leases to such uses.

We recommend that state government and industry recognise the approach as a way to satisfy current requirements that there will be some level of community and stakeholder agreement about

post-mining land uses. Government and industry should also consider how to integrate such participatory processes in regulatory decision-making about certification and relinquishment as a way of including the values and experience of ordinary individuals/lay people, integrating the knowledge and technical expertise of experts and respecting mine rehabilitation and closure policy requirements. This could be achieved for instance, by including panel reports in surrender submissions and in regulator processes for ensuring compliance. It implies formalising:

(a) the legitimacy and status of views emerging from such an approach
(b) how it may feed into mining company life-cycle practices and certification and relinquishment processes currently prevailing in Queensland.

6. Attached Reports

The key results presented above are elaborated further in a series of attached Reports that relate to the various stages and objectives of the research project. These are listed below:

Report 1: Processes to transfer post-mining lands to agricultural uses in the Bowen Basin: issues, economics and analysis

Report 2: An evidence based proposal for stakeholder engagement in post-mining land uses

Report 3: Models for stakeholder engagement in land use change decisions in the Bowen Basin.

Report 4: Assessing the convergence of stakeholder views on post-mining lands uses in the Bowen Basin

Report 5: Using workshop processes to generate stakeholder agreement about post-mining land uses

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Appendix 1: Workshop agendas

Planning for post-mining land use in Central Queensland

Workshop 1: Thursday 23rd February 2017

Venue: Blackwater International Coal Centre, Capricorn Highway, Blackwater QLD 4717

Session	Description – Orientation to the exercise
From 8.30 am	Coffee
9am -9.30 am	Welcome, Acknowledgement of TOs, Safety and housekeeping Introductions and overview of the day
9.30 am – 10.00	Short survey
10am -10.45 am	Background to the project – Prof John Rolfe
10.45 am	Morning tea
11.00 – 11.30 am	Brainstorm and discussion: • Key topics to explore in future • My definition of sustainable grazing in Central Queensland and useful/ viable grazing land? • The most important issues to work through in any one case
11.30 – 11.45	Looking forward – volunteers for the scenario challenge: How would the hypothetical property function as a sustainable grazing property? – How should the next workshop be run? Who else to invite? What resources you'll need to tackle the task productively – presenters? A site visit? Photos? Maps? Dates, duration, Location and logistics
11.45 – 12.00	Summary, Next Steps, Thanks and Close
12.00- 1.00 pm	Lunch

Planning for post-mining land use in Central Queensland

Workshop 2: Thursday 27th April 2017

Venue: Blackwater International Coal Centre, Capricorn Highway, Blackwater QLD 4717

The aim of this research project is to identify the land uses that the Central Queensland community would like to see for post-mining lands, and the process for converting land from mining back to other uses as well as the potential involvement of local stakeholders in the process.

Session	Description – Orientation to the exercise
From 8.30 am	Coffee
9am -9.30 am	Welcome, Acknowledgement of TOs, Safety, housekeeping and introductions.
9.30 am -10.00 am	Background to the project – University perspective –John Rolfe (10 Min) Industry / ACARP perspective (John Merritt) (10 min)
	Overview of closure processes
10.00-10.30am	Introduction to the mock mine example (Jo-anne Everingham)
10.30 am	Morning tea
10.45- 11.15	Brainstorming "What are the issues that you believe need to be addressed for this mine to be incorporated into a grazing property?" • What are the key things that you would need to know about the site before you could make informed decisions? • What mix of land uses could be appropriate for this case study site after mining and rehabilitation is completed? • What standard of rehabilitation is required in different parts to make the land suitable for a grazing enterprise? • How productive do you expect the different areas of land/ domains would be? • What could be done with land that is unsuitable for grazing? • What monitoring and management conditions/responsibilities would you be prepared to accept (particularly for early use)
11.15 – 12.00 pm	Property planning–How would you design the landscape and improvements to use this land as a grazing property? What would be appropriate ways for a grazier to manage this site? [Each participant to identify how they would design the mock mine example into a grazing property]
12.00 – 12.30 pm	Group discussion of how to manage the issues that have been identified and integrate the land into a grazing enterprise? **What are the key issues and concerns**? What would be achievable? (i.e. risks and opportunities).
12.30 – 12.45pm	Summing up and consultation about suggestions and plans for future sessions
12.45- 1.00pm	Thanks, Feedback on workshop, plans for next workshop (and close)
1.00 pm – 1.30pm	Lunch and depart

Planning for post-mining land use in Central Queensland

Workshop 3: Thursday 1st June 2017

Venue: Blackwater International Coal Centre, Capricorn Highway, Blackwater QLD 4717

Session	Description
From 8.30 am	Coffee
9am -9.30 am	Welcome, Acknowledgement of TOs, Safety and housekeeping Intro to project; Introductions of participants and their sectors
9.30am -9.45 am	Updates on previous workshops and other parallel developments in the policy space – Prof John Rolfe Overview of rehabilitation at Rolleston Coal
9.45 am -10.30 am	Expert Presentation 1: Water management post-mining, Melissa Wells or EHP representative (TBC) (15 minutes with questions and discussion)
	Expert Presentation 2: Rehab and mine closure issues, voids, slope and vegetation - Stuart Richie (15 minutes with questions and discussion)
	Expert Presentation 3: Contamination issues – John Merritt (15 minutes with questions and discussion)
10.30 am	Morning tea
10.45 am -11.45am	Group work – mock mine – overall proposition plus consideration of key domains and issues
11.45am – 12.15pm	Summary of issues and acceptable 'solutions' from each group
12.15 -12.45 pm	Looking forward to process: The value of stakeholder panels – who, how, when, why (function)? what format?
12.45 – 1.00 pm	Summary, Next Steps (including potential field trip), Thanks and Close
1.00 – 1.30 pm	Lunch

Planning for post-mining land use in Central Queensland

Workshop 4: Thursday 10th August 2017

Venue: Blackwater International Coal Centre, Capricorn Highway, Blackwater

Session	Description
From 8.30 am	Coffee
9am -9.30 am	Welcome, Acknowledgement of TOs, Safety and housekeeping Intro to project; Introductions of participants and their sectors
9.30am -9.45 am	Updates on previous workshops– Prof John Rolfe 'Model' of stakeholder engagement and outputs of each workshop. Identify challenges of incorporating stakeholder expertise in post-mining planning • Who constitutes the panel? • Maintaining commitment and engagement? • Deterrents to participation and ways to overcome them? • Ways of making authoritative technical information available?
9.45 am -10.30 am	Models of stakeholder engagement (Speakers – John Rolfe, Lisa Cafferty and Ken Dixon (tbc)) • Community Consultative Group • Special Issues Group • Community Reference Panel • Expert Advisory Panel • Taskforce Factors that distinguish engagement approaches + use maps to illustrate potential outcomes of a couple of approaches Challenges to consider
10.30 am	Morning tea
10.30 – 11.30am	How should stakeholder panels operate – who, how (format), when, why (function)? What (scope)? (These will inform the ToRs)
11.30 -12.15 pm	Group discussion on suitable models of engagement How can they meet the challenges? How can they feed into existing system? Advantages and disadvantages of each.
12.15 – 12.30 pm	Summary, Future engagement, Thanks and Close
12.30 – 1.00 pm	Lunch
1.00 – 4.00 pm	Mine tour