31 July 2026

To: Department for Energy and Mining

Re: Draft Guideline for Groundwater impact assessment for Scoping, Mining applications and Programs

Introduction

AMEC appreciates the opportunity to provide feedback to the Department for Energy and Mining (DEM) on the Draft Guideline for Groundwater Impact Assessment for Scoping, Mining Applications and Programs.

AMEC thanks DEM for engaging with industry stakeholders prior to the finalisation of the Guidelines. This consultation process is important to ensure the Guidelines are practical, effective and capable of supporting both regulatory objectives and industry implementation, while providing clarity and certainty for proponents undertaking groundwater impact assessments.

About AMEC

The Association of Mining and Exploration Companies (AMEC) is a national industry association representing over 550 member companies across Australia. AMEC's member companies account for over $100 billion of the mineral exploration and mining sector's capital value. Our members are mineral explorers, emerging miners, producers, and a wide range of businesses working in and for the industry. AMEC's membership base in South Australia comprises 45 exploration and mining companies, including companies undertaking pilot trials, mine development and mining operations. A further 45 AMEC member companies are local suppliers and service providers supporting industry to deliver projects.

General *Comments*

AMEC supports DEM's efforts to provide clearer guidance on groundwater impact assessments. The draft Guidelines represent a positive step toward improving clarity, consistency and transparency in groundwater assessments and are a significant improvement on the 2023 version that was limited to a guide on using SARIG to locate, access and interpret groundwater information relevant to mining proposals and PEPRs.

The updated Guidelines provide a clearer articulation of the objectives and expectations for groundwater impact assessments. By outlining a more structured and transparent assessment framework, the Guidelines will assist proponents in navigating regulatory requirements more efficiently while supporting consistent decision-making by regulators. AMEC supports this approach, as it has the potential to improve Government efficiency and Industry productivity, streamline the assessment processes, and ultimately facilitate the timely development of new mining projects in South Australia.

Recommendations

AMEC has consulted with its member companies, including proponents that have recently progressed through the new Scoping process. As some of the first projects assessed under this framework, they have identified several practical implementation challenges and opportunities to improve process efficiency.

AMEC has also sought input from environmental and groundwater specialists with extensive experience preparing groundwater investigations and impact assessments for mining applications in South Australia. Drawing on the experience of both proponents and technical experts, AMEC provides the following recommendations to strengthen the Guidelines and support their effective implementation.

1. Improve regulatory coordination between DEM, DEW and EPA and establish a more streamlined groundwater assessment pathway. Ensure assessment staff maintain a comprehensive understanding of contemporary groundwater assessment practices.

2. Include a project lifecycle flowchart that clearly identifies regulatory responsibilities, decision points and agency involvement throughout the groundwater assessment process.

3. Include a formal decision tree, linking Screening Risk Factors with the appropriate groundwater assessment tools and level of impact.

4. Include guidance that groundwater data collection programs should be proportionate to the level of assessment being undertaken.

5. Introduce an early groundwater data collection section to encourage proactive hydrogeological characterisation during exploration.

6. Strengthen the conceptual hydrogeology section by emphasising early development and iterative refinement of conceptual models.

7. Recognise analytical models as a valid and often appropriate assessment tool and avoid creating an implicit expectation that numerical modelling is required.

8. Provide greater guidance on uncertainty analysis and clearly distinguish it from sensitivity analysis.

9. Groundwater exploration activities should be streamlined and treated consistently with mineral exploration activities under the broader mining approval framework.

10. Don’t create separate groundwater assessment requirements for In Situ Recovery (ISR) mining.

Recommendations in Detail

1. Improve regulatory coordination between DEM, DEW and EPA and establish a more streamlined groundwater assessment pathway. Ensure assessment staff maintain a comprehensive understanding of contemporary groundwater assessment practices.

Groundwater approvals remain one of the most complex and time-consuming regulatory issues facing mining projects in South Australia. AMEC members consistently report differing expectations between DEM, DEW and the EPA, resulting in duplication, delays and uncertainty. While DEM has developed a clear objective for the scoping process, there can be differing interpretations across agencies regarding the scope and level of detail required at various stages of assessment.

AMEC recommends government agencies work toward a more coordinated assessment framework that includes:

- Clear agency responsibilities
- Accountability for timeframes and outcomes
- Agreed risk-based assessment categories
- Streamlined pathways for low-risk projects
- Agreed modelling expectations for medium and high-risk projects
- Mechanisms for greater data sharing

AMEC also supports ongoing professional development and continual learning across regulatory agencies to ensure assessment staff maintain a comprehensive understanding of contemporary groundwater assessment practices, the appropriate application of conceptual, analytical and numerical tools, and what level of information is reasonably required at each stage of the approvals process. Improved consistency in regulatory expectations would provide greater certainty for proponents and reduce the risk of unnecessary studies, rework and delays.

Consideration should also be given to whether the Coordinator-General could assist in facilitating greater coordination between agencies.

2. Include a project lifecycle flowchart that clearly identifies regulatory responsibilities, decision points and agency involvement throughout the groundwater assessment process.

AMEC members consistently identified uncertainty regarding the interaction between DEM, DEW and the EPA as one of the greatest challenges in progressing groundwater assessments. While DEM has established a clear objective for the scoping process, proponents frequently receive differing or additional requests from other agencies that extend beyond the agreed scope, resulting in changing expectations, project delays and increased costs.

The Guidelines would benefit from the inclusion of a project lifecycle flowchart illustrating:

- Key approvals and assessment stages
- Agency responsibilities at each stage
- Approval and review gateways
- Expected information requirements
- Opportunities for consultation and feedback

This would improve transparency, reduce duplication and provide proponents with greater confidence regarding regulatory expectations. An example can be found in the 'Western Australian water in mining guidance' – attached in this document as Appendix 1.

AMEC further recommends that DEM continue to work with the Department for Environment and Water (DEW) and the Environment Protection Agency (EPA) to ensure a shared understanding of groundwater assessment requirements and the purpose of Scoping. A coordinated and consistent regulatory approach would improve efficiency and reduce unnecessary rework.

3. Include a formal decision tree linking Screening Risk Factors with the appropriate groundwater assessment tools and level of impact.

AMEC supports the introduction of screening risk factors in the draft Guidelines. However, the usefulness of the framework would be significantly improved through a structured decision tree that links screening outcomes with the groundwater assessment tools discussed in the Guidelines.

The decision tree should consider:

- Depth of mining relative to groundwater
- Proximity to groundwater-dependent ecosystems
- Groundwater users and environmental receptors
- Hydrogeological complexity
- Data availability and confidence
- Cumulative impact considerations

The outcome should then guide proponents toward an appropriate level of assessment, ranging from conceptual hydrogeological assessment, analytical modelling, simplified numerical modelling or comprehensive numerical modelling.

This would provide greater certainty for proponents, particularly junior explorers and emerging miners, and help ensure investigations remain proportionate to risk.

4. Include guidance that groundwater data collection programs should be proportionate to the level of assessment being undertaken.

The level and cost of groundwater investigations should align with the complexity of the proposed assessment method. The Guidelines should encourage a staged approach to data collection that provides information commensurate with the level of modelling and assessment required.

For example, where an analytical assessment is being undertaken, confidence may be improved through a wider range of lower-cost hydraulic data, such as slug tests across multiple locations, monitoring bore observations, water level monitoring and groundwater quality data.

In many circumstances this information can be more valuable than undertaking an expensive pumping test on a single bore. This is particularly important for junior exploration companies, where groundwater investigation costs can become a significant barrier to project advancement.

5. Introduce an early groundwater data collection section to encourage proactive hydrogeological characterisation during exploration.

AMEC considers there is currently a significant gap in the Guidelines regarding groundwater data collection during exploration. Often, by the time hydrogeologists or groundwater consultants become involved in a project, substantial exploration drilling programs have already been completed, resulting in valuable hydrogeological information being lost.

The Guidelines should include discussion on the value of collecting and retaining early-stage information, including:

- Drilling observations such as dry, moist, wet and water-producing intervals
- Records of water strikes
- Documentation of null groundwater observations
- Observations of surface water behaviour after rainfall events
- Early monitoring bore installation
- Early water level monitoring
- Groundwater quality observations
- Slug testing, including testing of low-yield bores

Importantly, negative or null groundwater observations are often as informative as positive groundwater intercepts when developing a conceptual hydrogeological model. Encouraging this information to be captured systematically would improve conceptual understanding, reduce uncertainty and ultimately lower modelling and assessment costs.

6. Strengthen the conceptual hydrogeology section by emphasising early development and iterative refinement of conceptual models.

AMEC supports the emphasis placed on conceptual hydrogeology within the draft Guidelines. However, the Guidelines should place additional emphasis on the value of developing conceptual hydrogeological models early during exploration and refining them as new information becomes available.

An effective staged process may include:

Exploration drilling → Preliminary desktop conceptual model → Additional targeted data collection → Model refinement → Impact assessment and modelling.

Early conceptual models can identify critical knowledge gaps, guide efficient data collection, support exploration planning, improve groundwater investigations and reduce the need for expensive rework later in project development.

This approach allows groundwater information to be collected opportunistically alongside exploration activities, improving project efficiency and reducing costs.

7. Recognise analytical models as a valid and often appropriate assessment tool and avoid creating an implicit expectation that numerical modelling is required.

AMEC welcomes the draft Guidelines' discussion of multiple groundwater assessment tools. However, members consider that analytical modelling is still implicitly presented as secondary to numerical modelling.

There have been situations where the source-pathway-receptor assessment clearly demonstrated no viable pathway for groundwater impact, yet proponents were nevertheless required to undertake expensive numerical modelling to satisfy regulatory expectations.

Analytical solutions can:

- provide robust and conservative assessments
- support early decision-making
- demonstrate whether impacts are likely to be negligible
- identify whether more detailed investigations are warranted
- significantly reduce costs and timelines

For many lower-risk projects, particularly exploration projects and smaller mining developments, analytical methods may provide sufficient evidence to support decision-making without the need for complex numerical models.

AMEC recommends the Guidelines explicitly state that analytical assessments may be appropriate where they adequately address the identified risks and project objectives.

8. Provide greater guidance on uncertainty analysis and clearly distinguish it from sensitivity analysis.

AMEC supports the draft Guidelines' acknowledgement of uncertainty analysis. However, the document currently provides limited practical guidance regarding how uncertainty should be assessed, communicated and incorporated into decision-making. There is also a risk that uncertainty analysis is confused with traditional sensitivity analysis.

The Guidelines should define uncertainty and sensitivity analysis separately, outline acceptable uncertainty assessment approaches, provide examples relevant to both analytical and numerical modelling and explain how uncertainty should be communicated to regulators. Improved guidance would support more consistent application across industry and regulatory agencies.

9. Groundwater exploration activities should be streamlined and treated consistently with mineral exploration activities under the broader mining approval framework.

AMEC members noted that groundwater exploration and investigation activities often involve separate approval pathways which can create unnecessary delays and duplication. Industry would benefit from an approval pathway that recognises groundwater investigations as temporary exploration activities that are rehabilitated following completion, rather than as permanent land-use changes.

Where environmental risks are low and temporary in nature, the approval process should be streamlined and proportionate to the activity being undertaken.

10. Don’t create separate groundwater assessment requirements for In Situ Recovery (ISR) mining.

Industry have indicated that they don’t support the creation of separate groundwater assessment frameworks or requirements specifically for ISR operations. Members noted that the groundwater assessment principles contained within the draft Guidelines already reflect the types of investigations and assessments that ISR proponents undertake as part of existing exploration and mining approvals.

Creating ISR-specific groundwater assessment requirements risks:

- Introducing unnecessary duplication
- Creating an additional regulatory pathway
- Increasing assessment complexity
- Reinforcing the perception that ISR is fundamentally different from other mining methods

ISR should be regulated using the same risk-based groundwater assessment principles applied to other mining activities, with project-specific risks addressed through the existing assessment process rather than through a separate guideline or framework.

Final comments

The draft Guidelines represent a positive step toward improving clarity, consistency and transparency in groundwater assessments. The recommendations outlined above are intended to further strengthen the Guidelines by promoting a risk-based, proportionate and coordinated approach that delivers robust environmental outcomes while enabling efficient project assessment and development.

Continued engagement

AMEC welcomes DEM's engagement with industry throughout the development of these Guidelines and supports ongoing collaboration as they are finalised and implemented.

AMEC's membership includes exploration and mining companies, environmental specialists and experienced hydrogeologists who have worked within South Australia and across other Australian jurisdictions. Members and industry partners have indicated a willingness to work with DEM to provide practical input on the proposed decision tree linking Screening Risk Factors to groundwater assessment tools, as well as the development of project lifecycle flowcharts and risk-based assessment pathways.

Continues engagement with industry will help ensure the Guidelines are practical, proportionate and capable of delivering robust environmental outcomes while supporting efficient and predictable assessment processes. AMEC would welcome the opportunity to participate in any future technical discussions to assist DEM in refining these elements of the Guidelines.

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Appendix 1 – Process Flow chart[1]

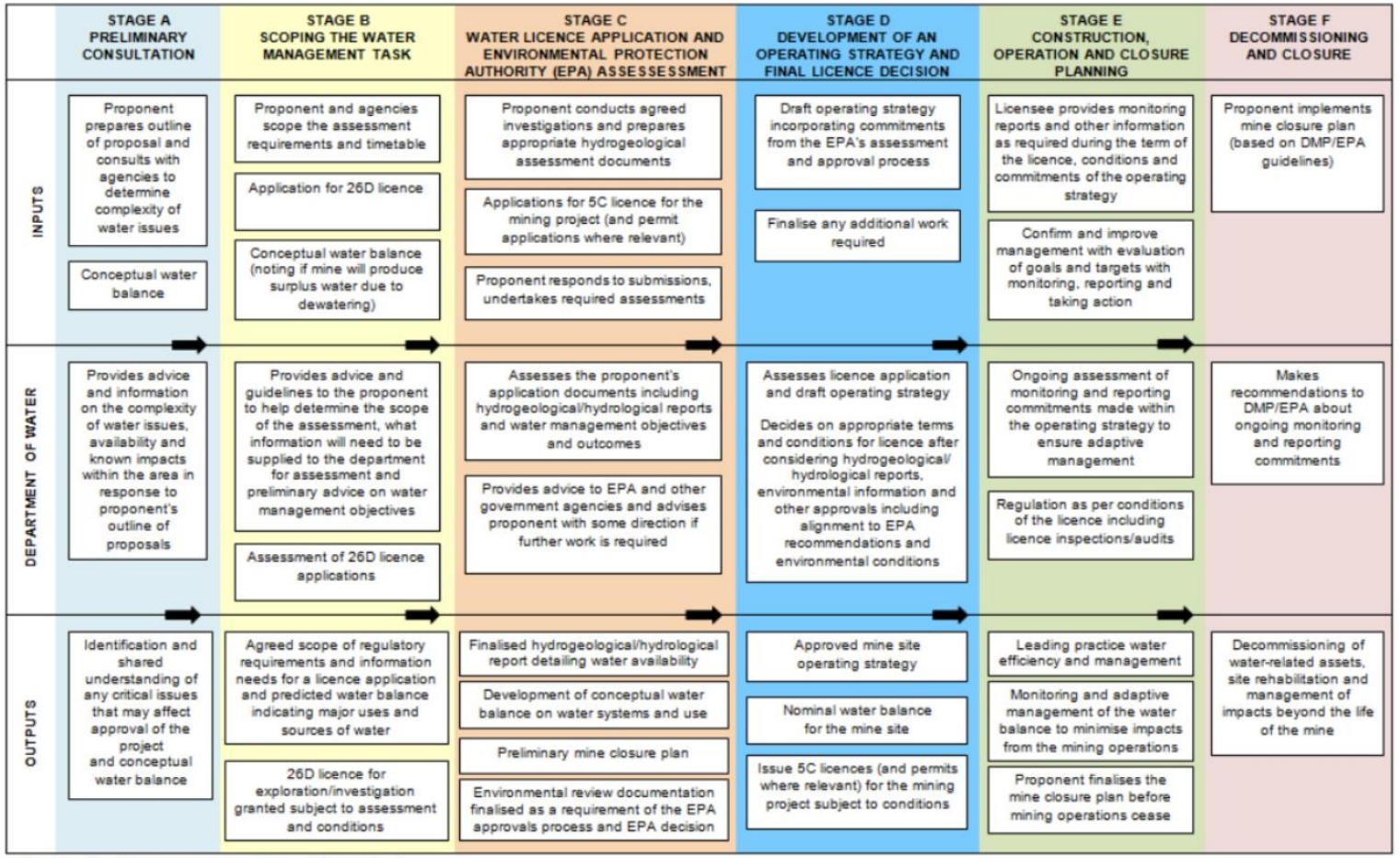

Figure 1 Summary process flow chart

[1] Western Australia Water in mining guideline. May 2013. https://www.wa.gov.au/system/files/2025-07/western_australian_water_in_mining_guideline_1.pdf