

Notice

Environmental Protection Act 1994

Information request

This information request is issued by the administering authority under section 140 of the Environmental Protection Act 1994 (Qld) to request further information needed to assess an application for a PRCP schedule.

To: Magnetic South Pty Ltd
Suite 302, Level 3, 102 Adelaide
Street, Brisbane QLD 4000
By email transmission only

Attention: Daryl Kidcaff, Dianne Dee

Email: daryl@magnetic-south.com.au; dianne.dee@magnetic-south.com.au

Our reference: P-EA-100114292

Further information is required to assess an application for a PRCP schedule

1. Application details

The application for a PRCP schedule was received by the administering authority on 6 December 2024.

The application reference number is: C-PRCP-100776070

Land description: ML700056

2. Information request

The administering authority has considered the abovementioned application and is writing to inform you that further information is required to assess the application (an information request).

The information requested is provided in **Appendix 1: Additional information required for proposed PRCP schedule.**

3. Actions

The abovementioned application will lapse unless you respond by giving the administering authority -

- (a) all of the information requested; or
- (b) part of the information requested together with a written notice asking the authority to proceed with the assessment of the application; or
- (c) a written notice –

- i. stating that you do not intend to supply any of the information requested; and
- ii. asking the administering authority to proceed with the assessment of the application.

A response to the information requested must be provided by **18 August 2025** (the information response period). If you wish to extend the information response period, a request to extend the period must be made at least 10 business days before the last day of the information response period.

The response to this information request or a request to extend the information response period can be submitted to the administering authority by email to CRMining@des.qld.gov.au.

If the information provided in response to this information request is still not adequate for the administering authority to make a decision, your application may be refused as a result of section 176 of the *Environmental Protection Act 1994*, where the administering authority must have regard to any response given for an information request.

4. Human rights

A human rights assessment was carried out in relation to this decision, and it was determined that the decision is compatible with the human rights.

If you require more information, please contact Business Centre Coal on the telephone number listed below.



Signature

18/02/2025

Date

Jessica Johnson
Department of the Environment, Tourism, Science
and Innovation
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Business Centre Coal
PO Box 3028, Emerald QLD 4720
Phone: 4987 9320
Email: CRMining@des.qld.gov.au

Appendix 1: Additional information required for proposed PRCP schedule

Provide a revised PRC plan (including PRCP schedule) that addresses the following matters:

Item	PRCP Plan/Schedule	Issue	Required Information
1.	3.1.4.1 Surface water quality	Water quality limits The Water Quality Objectives (WQO) for the Mackenzie River Sub-Basin are reported in Table 7. However, the limits do not appear correct e.g. Chromium (1900 µg/L). Table 30 (section 3.5.4) states that Chromium (1900 ug/L) is a limit from ANZG 2018. The ANZG guideline for aquatic ecosystem protection (95%) and (80%) is 1 µg/L and 40 µg/L respectively. The department requires additional clarity on where the limits presented in Table 7 and Table 30 are sourced, to ensure that appropriate water quality limits are applied to the PRCP for monitoring of rehabilitation.	1. Update the PRC Plan to clarify the source of the limits provided in Table 7 (section 3.1.4.1) and Table 30 (section 3.5.4), 2. If the limits provided in Table 7 and Table 30 have not been transposed correctly from the source material, amend the limits accordingly.
2.	3.1.4.1 Surface water quality	Contaminants of concern (CoC) Table 9 in section 3.1.4.1 shows the surface water monitoring data (2019-2024), however there is no explanation for the parameters chosen to be reported. Only mean data is provided, and the appendices do not include all data collected. The water quality parameters should align with an analysis of the potential contaminants of concern (CoC). The parameters reported in for the PRCP plan are not clearly linked with any analysis of the CoC for the site. Overall the PRCP contains limited analysis of the CoC for the site, and further detail is necessary to demonstrate a meaningful linkage between the monitoring parameters and the contaminants potentially generated by mining. The PRCP guideline section 3.1 requires EA holder to provide baseline information with respect to site hydrology and fluvial networks. In accordance with the PRCP guideline section 3.6.1, the Rehabilitation Planning Part must include a description of the following: • a description of the contaminants that pose a risk to environmental values of the receiving environment.	1. Update the PRC Plan to include: • Analysis of contaminants of concern at the site. This should consider the relevant activities on site, and the characterisation of waste material. • Summary statistics of baseline water quality (Table 9) should include median, 80th and 95th percentiles, in addition to mean.

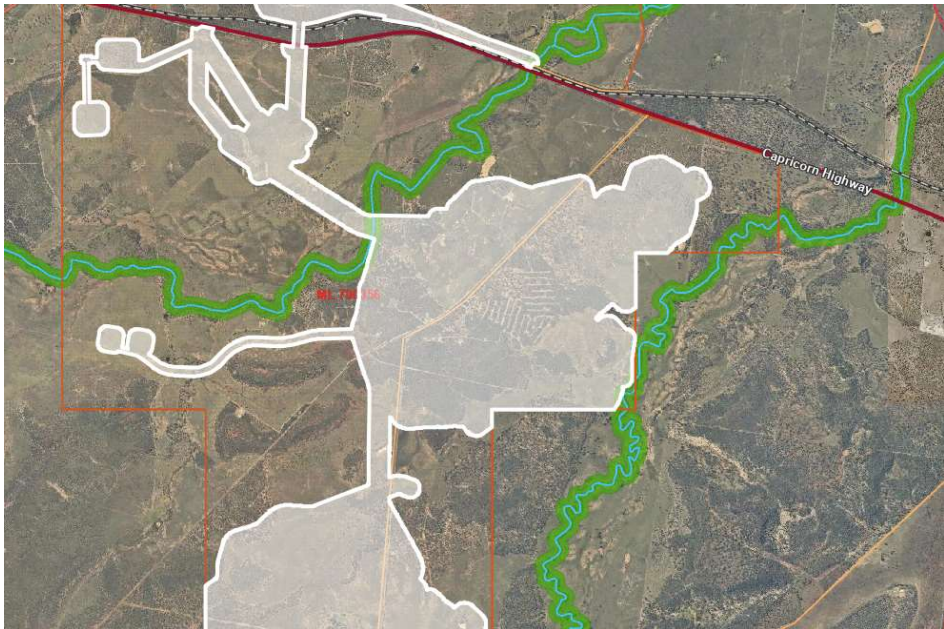
		source, pathway and fate of contaminants that have the potential to impact environmental values. CoC should be consistent between surface water and groundwater. This information is important as it helps to determine the water quality limits, as well as the suitability of monitoring locations to demonstrate the stability and non-polluting state of the final rehabilitated landform. It should be noted that water quality objectives for post-closure are often different to operational water quality limits in the EA. It should be noted that Condition F3 of the EA requires a study of the source of contaminants to be completed for the Water Management Plan, which is due within one month of the grant of ML. This study should have already been completed, and should be provided to support the PRC Plan.	Include all surface water data collected to date as an appendix to the PRC Plan. 2. Provide the Water Management Plan developed in accordance with Condition F3 of the EA including the study of source contaminants.
3.	3.1.5 Groundwater	Groundwater environmental values (EVs) This section comments on the suitability of groundwater for stock uses, however does not provide any information on the environmental values of the groundwater resource. The Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (EPP) identifies the environmental values to be protected for waters and wetlands in Queensland. Environmental values (EVs) can include biodiversity, aquaculture, stock watering, cultural and spiritual values, and recreation or aesthetic values. Figure 20 shows the locations of potential groundwater dependant ecosystems (GDE) areas, however there is no discussion on the importance of the groundwater resource to these GDEs in this section. A detailed description of the groundwater environmental values is required in this section demonstrate that groundwater resources have been considered in the design for closure and underpin the rehabilitation methodology.	1. Update the PRCP Plan to describe the environmental values for groundwater in more detail.
4.	3.1.5.5 Groundwater quality 3.1.5.7 Groundwater level	Groundwater quality data Table 10 in section 3.1.5.5 provides a summary of groundwater quality results from monitored bores. Groundwater data should also be presented based on bore specific data, given the range of data presented in the table. Similarly, Figure 24 should provide water level data for individual bores. The groundwater level data (Figure 24) should be provided for each bore to accurately see the changes in groundwater	1. Update the PRC Plan to include: Provision of bore specific data as separate table.

		level, however it is appropriate to still identify this data according to hydrogeological unit (as coloured in Figure 24). A complete understanding of bore specific groundwater data is required to ensure the groundwater values are properly considered in rehabilitation. By combining water level data from multiple bores, it is not possible to review trends in individual bores.	- Revised Figure 24, showing groundwater level trends for each specific bore - Provision of all groundwater data collected to date as an appendix to the PRC Plan.
5.	3.1.6.6 Land Suitability	Land suitability This section on land suitability states that the assessment was carried out in accordance with the methodologies: - Guidelines for Agricultural Land Evaluation in Queensland (DSITI & DNRM 2015); and - Chapter 10 (Suitability framework for the inland Fitzroy and southern Burdekin area) of the Regional Land Suitability Frameworks for Queensland (DNRM & DSITI 2013). However, the interpretation of data and ranking of the land according to the five-class land suitability system was conducted using the Technical Guidelines for Environmental Management and Exploration and Mining in Queensland (DEM 1995). It is DETSI's preference that the 'Guidelines for Agricultural Land Evaluation in Queensland (DSITI & DNRM 2015)' is used to determined LSA classes, as referenced in the QMRC technical paper 'Grazing as a post-mining land use – implications for leading practice (July 2024). To ensure that the LSA class has been determined appropriately, the PRC plan should include an assessment of the LSA class determined in accordance with the 'Guidelines for Agricultural Land Evaluation in Queensland (DSITI & DNRM 2015)'. If there is any difference in the determination when assessed under each framework this should be discussed in section 3.1.6.6. If preference is given in the PRC plan and Schedule to adopting the results of the existing assessment using the Technical Guidelines for Environmental Management and Exploration and Mining in Queensland (DEM 1995), an explanation should be provided as to why this is the more suitable approach. It is necessary to demonstrate that the QMRC technical papers relevant to land suitability have been duly considered in developing the PRCP.	1. Update the PRC Plan to include: - An explanation as to why the DEM 1995 guideline was used to categorise LSA classes, rather than the DSITI & DNRM 2015 guideline - An assessment of land suitability using the DSITI & DNRM 2015 guideline and a discussion on any variation in the results between the two approaches.
6.	3.1.7 Flora and fauna	Regional ecosystems	1. Update the PRC Plan to include the comparison between the certified

		Section 3.1.7.1 outlines the regional ecosystems present on the mining lease, and it is assumed these are listed from the outcomes of on-ground surveys. It does not recognise the certified regional ecosystem mapping, and whether there are differences between the two. The Queensland Herbarium has recently undertaken a review of the regional ecosystems, resulting from a request by the applicant to change the certified RE mapping. The outcomes of this change should be included in the PRC Plan, and if any differences between the certified RE mapping and the vegetation mapping shown in Figure 30 remain. This is necessary to ensure than the PRC plan is underpinned by the most recent and accurate information available.	RE mapping and on-ground verified vegetation communities.
7.	3.1.7 Flora and fauna	Conservation significant species This section notes the following conservation significant species occurring within the project area: • <i>Cerbera dumicola</i> – Near Threatened plant species • Southern squatter pigeon (<i>Geophaps scripta scripta</i>) – Vulnerable species under the EPBC Act and NC Act • Greater glider (<i>Petauroides volans</i>) – Vulnerable species under the EPBC Act and NC Act (also please confirm if it is <i>Petauroides volans volans</i>, which is Endangered under the EPBC Act and NC Act). • Rufous fantail (<i>Rhipidura rufifrons</i>), which is listed as a migratory and marine species under the EPBC Act • Rainbow bee-eater (<i>Merops ornatus</i>), which is a listed marine species under the EPBC Act • Short-beaked echidna (<i>Tachyglossus aculeatus</i>), which is not an EVNT species but is listed under the NC Act as Special Least Concern There are no maps showing the location of where these species have been recorded. It is also noted that no Matters of State Environmental Significance (MSES) mapping, including essential habitat, is shown for the project area. This is important, in relation to what PMLU is proposed and whether any rehabilitation considerations have been made for these species in the long-term.	1. Update the PRC Plan to include: • Map of conservation significant species survey records, with MSES and essential habitat mapping • Any rehabilitation considerations for known conservation significant species habitat, and how this relates to the proposed PMLU

8.	3.2 Community consultation	Taunton National Park (Scientific) Section 3.2.1 states that Magnetic South has undertaken consultation and discussions with underlying landholders, neighbours, native title groups (the Gaangalu Nation People), local council representatives and state government representatives. Table 19 lists a summary of the different entities that have been consulted from 2019 to 2024, with only affected landholders and DETSI (incorrectly identified as Council Meeting) being consulted in regards to the PRCP outcomes. No consultation with Queensland Parks and Wildlife Services (QPWS) Central Region staff, the managers of Taunton National Park (Scientific), which adjoins the ML, has been recorded. It is strongly advised that Magnetic South consult with key contacts for Taunton National Park (Scientific), regarding the outcomes of the Gemini Coal Mine PRCP.	1. Update the PRC Plan to include the outcomes of consultation with the Rangers of Taunton National Park (Scientific).
9.	3.2.3 Stakeholder engagement plan	Community consultation register This section states that Magnetic South has developed a consultation register (Table 19) in accordance with the requirements of the EP Act. It then says that a summary of the key consultation records relevant to the PRC Plan has been provided in Table 19. There is no full consultation register attached to the PRC Plan, so it doesn't appear that the full register has been provided. As per the PRCP guideline, section 3.5 states that the community consultation register must include: • Consultation dates • Identification of each community member • Description of consultation type • Information provided to the community • Issues raised/discussed by the community • Decisions/outcomes of engagement • Commitments made by the applicant.	1. Update the PRC Plan to either include the full community consultation register as an appendix, or provide more detail to the summarised version in Table 19. It should: • Identify each community member • Separate the information provided to the community, and the issues raised by the community • Confirm whether details of the PRC Plan and schedule (including rehabilitation methods, progressive rehabilitation and closure timeframes) have been communicated to the public, in

		The community consultation register provided as Table 19 does not include identification of each community member (only industry type/entities), or clearly list the issues raised by the community (these should be separated from the information provided/matters discussed). The register also mentions that objections/submissions were received by affected landholders, however no details of the issues raised in these submissions are included in the register, only information provided/discussion. Therefore it can't be determined how these issues have been considered by Magnetic South and incorporated in the PRCP process. In developing the proposed PRC Plan, the community should at least be engaged on the plan for the mine, PMLUs or NUMAs, areas of disturbance, rehabilitation and management methods, progressive rehabilitation and closure timeframes. The department is legally required to consider any potential impacts on human rights during the decision making process under the <i>Human Rights Act 2019</i>. It is important that the application can clearly articulate those cultural rights relevant to the site and how these have been consulted upon to ensure the ongoing protection of cultural rights of those individuals potentially impacted. The application does not clearly identify those cultural rights determined through early engagement or native title engagement. It is likely that the time that has passed since the listed cultural engagement that has occurred, that there may be a further need to re-engage with those individuals and groups relevant to the rehabilitation and ongoing connection to the land to understand their cultural connections. Impacts to cultural values are not able to be determined, unless a proper understanding is presented as to what these potential values include.	particular neighbouring landholders and those with cultural connection to the land. Detail is lacking around the specific outcomes of engagement, particularly in relation to the PRC Plan and schedule and if any matters remain unresolved.
10.	3.3 Post-mining land use	PMLU for remnant vegetation areas The current land use is recognised as low intensity cattle grazing native vegetation (section 3.3.2) and the PMLU of Low Intensity Grazing is recognised as having two components – Grazing and Grazing Native Vegetation (Section 3.3.3.1). However, the Rehabilitation Milestones and seed mixes proposed (grazing seed mix contains only pasture species), which indicates that the PMLU envisaged over much of the project area will be grazing improved pasture, not native vegetation. Though some of the site has been cleared, significant areas of remnant vegetation remain including that which provides considerable connectivity between two riparian corridors recognised as Regional Biodiversity Corridors, and in which the endangered southern greater glider (<i>Petauroides volans volans</i>) has been recorded.	1. Update the PRC Plan to include: - Revision of the PMLU proposed for areas currently containing remnant vegetation. These areas should not be proposed as grazing PMLU - Consideration for connectivity opportunities between the two riparian corridors identified as

		Rehabilitation of the site should aim to return the current connectivity and fauna habitat values of the area post mining by rehabilitating all areas currently under remnant vegetation with native woodland vegetation. Converting these areas to improved pasture would be a poor outcome for biodiversity. Regional biodiversity corridors:  Source: Queensland Globe	Regional Biodiversity Corridors.
11.	3.3.3 Proposed post-mining land use	Proposed PMLU The proposed PMLUs for RA7 (Retained dams) and RA8 (Diversion drains) are stated to be different between Table 20 and Table 22. These PMLU should be represented consistently in the PRC plan and should align with the Schedule. The stated PMLU in Table 22 for both RA7 and RA8 is grazing, which is considered to be a less suitable approach than the PMLU's stated in Table 20. for diversion drains is 'watercourse' or similar. This is consistent with other	1. Update the PRC Plan to ensure the proposed PMLUs for RA7 and RA8 are appropriate and consistent.

		approved PRCP schedules. The 'watercourse' PMLU should be aligned to a local riparian regional ecosystem (such as RE 11.3.25).	
12.	3.3.3 Proposed post-mining land use	Proposed PMLU The PMLU listed in Tables 20 and 22 for RA6 is grazing/ native vegetation. The milestone criteria required in the Schedule to ensure a grazing PMLU are distinctly different from the criteria required for a native vegetation PMLU and a mosaic of the two PMLU's is unlikely to be appropriate. The PMLU for RA6 should be limited to achieving grazing or native vegetation. The PMLU for RA6 should be re-evaluated and updated in the PRC plan and Schedule. As noted above in item 10, areas of pre-mining remnant vegetation should be rehabilitated to native vegetation where possible.	1. Update the PRC Plan to clarify the PMLU for RA6. 2. Update the PRCp Schedule to reflect a singular PMLU for RA6 and proposed suitable SMART milestone criteria for its achievement.
13.	3.3.3 Proposed post-mining land uses 3.5.6.7 Final void study	Final voids PMLU Magnetic South have made a commitment to rehabilitate the final voids to achieve a PMLU of fauna habitat. While this may be achievable in the first 100 years, there is risk associated with the increasing salinity levels and their ability to support an aquatic ecosystem over the long-term. Figure 52 (section 3.5.6.7) shows that the salinity levels are predicted to continue to increase over 500 years for Mine A void. A PMLU must be able to achieve a stable condition, which in accordance with s111A of the EP Act: Land is in a stable condition if – a) The land is safe and structurally stable, and b) There is no environmental harm being caused by anything on or in the land, and c) The land can sustain a PMLU. The requirement for land to sustain a PMLU, and prevent environmental harm, does not end after 100 years. The PRC plan must demonstrate how the final voids will achieve fauna habitat, particularly the aquatic ecosystem component, to reach a stable condition post-closure. The PRCP Schedule must include appropriate SMART criteria that will achieve and sustain the PMLU. As per section 3.2 of the PRCP guideline, it is the applicant's responsibility to provide sufficient evidence and justification regarding any proposed PMLU.	1. Update the PRCP Plan to explain how the final voids will reach a stable condition, and continue to sustain an aquatic ecosystem long-term. 2. Ensure criteria that meet the SMART principle are included in the schedule that will deliver a stable PMLU of fauna habitat.

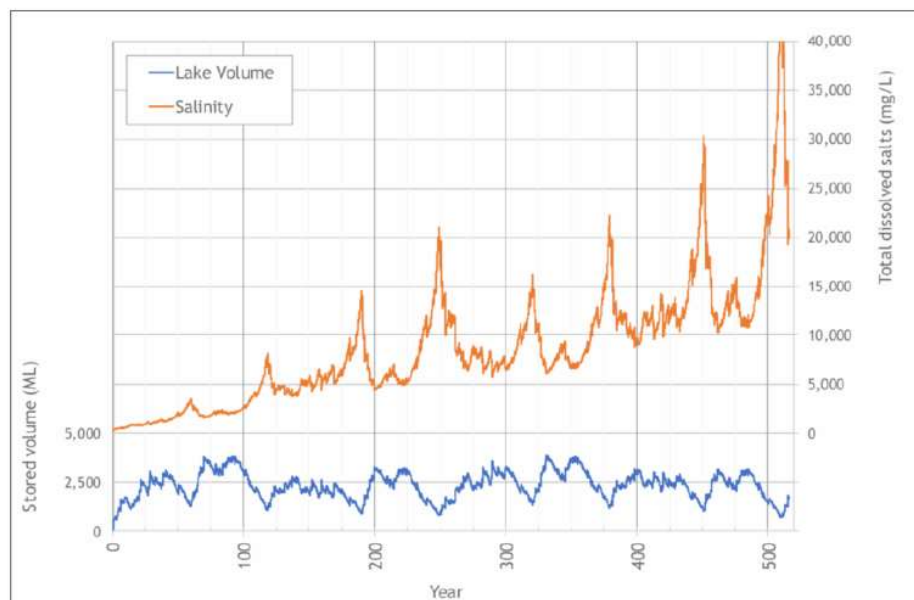


Figure 52: A Void post mining salinity

14.	3.3.3.2 Post mining land suitability	Grazing PMLU and Land Suitability Table 21 shows the pre and post mining cattle grazing land suitability class (LSC) areas. Post-mining, there is 1027 ha of land being proposed as LSC class 4, which is an increase of 780.8 ha of the pre-existing class 4 based on LSC calculated using DME 1995 methods. Pre-mining LSC shows that the majority of grazing lands is LSC class 2 or 3. It is expected that the post-mining LSC is returned to the pre-mining LSC. The technical report 'Grazing as a post-mining land use' produced by the Office of the Queensland Mine Rehabilitation Commissioner states that land suitability assessment (LSA) class 1 to 3 are recognised as suitable for a sustainable grazing PMLU. It states "Planning rehabilitation to achieve LSA Class 1-3 is	1. Update the PRC Plan and revise rehabilitation techniques to achieve a minimum class 3 LSA. 2. If there are areas that can not achieve LSA class 3, these may need to be proposed as an alternative PMLU.
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		considered leading practice for a grazing PMLU and should be undertaken prior to rehabilitation and inform rehabilitation milestones”. Rehabilitating land to a LSC class 4 is not considered commensurate with achieving a sustainable grazing PMLU. The Gemini Coal Mine is not an operational site and therefore it is considered that the design for closure must include the implementation of leading rehabilitation practice that will return the land to a sustainable grazing PMLU with a LSA class no less than 3. Note: retained water storages should not have a PMLU of ‘grazing’, therefore the LSC should not apply to these areas.	
15.	3.3.4.1 Alternative PMLUs considered	Final void options This section analyses three options to manage and reduce final landform residual risk. These options are summarised as: • Option 1 – Complete backfill of voids to achieve a modified pre-mining topography • Option 2 – Not backfilling voids • Option 3 – Partial backfill of residual voids to 80 m below ground level (bgl) Option 3 has been chosen as the preferred option, due largely to the costs associated with Option 1, and the environmental risk associated with Option 2. Option 3 was chosen as studies indicated that, with controls to limit surface water draining to the pits, saline inflows would be significantly reduced if the pit was backfilled to 80 m bgl. However, Option 3 still results in salinity levels that exceed 5,000 mg/L (approx. 9,090 µS/cm) after 100 years. It is unclear if any scenarios were considered to rehabilitate to a level between Option 3 and Option 1 were analysed, to optimise the water quality of the residual voids and reduce residual risk while considering rehabilitation costs. If a void backfill scenario that has the purpose of primarily optimising the water quality in the residual voids has not been evaluated, undertake to necessary analysis to determine the feasibility of a backfill scenario that delivers an improved water quality outcome when compared to Option 3. This analysis is required to ensure that rehabilitation will deliver the best possible environmental outcome for the residual void.	1. Update the PRC Plan to discuss any options that were analysed between listed Option 1 and Option 3, that may result in improved water quality in the residual voids. 2. If current Options 1-3 were the only scenarios evaluated in developing the PRC plan, complete a further options analysis to include a scenario that optimise the water quality outcome for the residual void. 3. If Option 3 remains the preferred scenario after considering further options, provide a justification as to why.

16.	3.5.4 Milestone criteria	Seed mixes <u>Grazing</u> Table 25 (Attachment 1 – Grazing PMLU seed mix) includes the species <i>Bothriochloa pertusa</i> (Indian bluegrass). This is a highly invasive species and is listed as an environmental weed. The use of environmental weeds in rehabilitation should be avoided to ensure a sustainable PMLU and <i>Bothriochloa pertusa</i> should be removed from the proposed seed mix. <u>Native Vegetation</u> For remnant vegetation areas, introduced species, for example Rhodes grass and Stylo should be removed from seed mixes. The species list for native vegetation areas should include trees and shrubs, appropriate to nominated local regional ecosystem(s). The proposed species lists have no designated target regional ecosystem. Appropriate RE types for the areas may include RE11.7.2 or RE11.5.2. Sterile cover crops can be used to aid establishment.	1. Update the PRC Plan and schedule to revise seed mixes and remove <i>Bothriochloa pertusa</i> from any seed mixes. 2. State which regional ecosystem(s) are guiding the species selection and provide a justification for their appropriateness with reference to the surrounding landscape and pre-mining conditions. 3. Revise the seed mixes that will be applied to areas which currently (pre-mining) include remnant vegetation, to ensure that trees and shrub species are included which align with a nominated RE type.
17.	3.5.4 Milestone criteria	Milestone timeframe Table 34 indicates the typical timeframe for surface achievement of native ecosystem revegetation states that a 10 year timeframe for establishment of mature, self-sustaining vegetation is typical. In the justification column, the proposed timeframe for the achievement of vegetation establishment is just 4 years. The justification doesn't clearly explain how the accelerated delivery of the targeted revegetation will be delivered compared with the typical timeframe. The proposed timeframe of 4 year is likely to be insufficient for suitable revegetation and establishment of a native ecosystem. It is expected that the timeframe of at least 15 years is applied to achieve self sustaining native vegetation, particularly if targeting woodland RE types. Realistic timeframes are required to be nominated in the PRC plan and Schedule to ensure delivery of the PMLU.	1. Update the PRC Plan and schedule to revise the timeframe for native ecosystem communities.

18.	3.5.4 Milestone criteria	Groundwater quality limits This section includes groundwater quality limits depicted in Table 32 for the PRCP. The data used to determine the limits in this table has not been underpinned by any provision of raw monitoring data. Further, the PRC plan should discuss how this data was used to derive the limits provided in Table 32. Given that the site is currently un-operational, a plan for future data collection and analysis required should also be discussed. This information is required to verify that the groundwater quality limits are suitable to be included in the Schedule to ensure the site is non polluting at closure.	1. Update the PRC Plan to include: • An explanation of how the groundwater quality limits were derived, based on all available monitoring data 2. All groundwater data collected to date as an appendix to the PRC Plan.
19.	3.5.6.2 Soil and cover material	Topsoil stockpiles The section on topsoil states that any topsoil stockpiles will be seeded. Further information is required in this section to clarify this approach. It is recommended that native seed is used for stockpile seeding. It is important to understand the seed mix and methodology proposed for all areas to provide a link to the delivery of the nominated PMLU for the area.	1. Update the PRC Plan to include native seed for topsoil stockpiles.
20.	3.5.6.2 Soil and cover material	Cover system This section states no cover system is required as the bulk reject stream is expected to be NAF with excess acid neutralising capacity. This conclusion cannot be verified until actual mining operations are commenced. The section also notes that the coal reject material presents a range of geochemical properties which leaves some ambiguity around the presence of PAF material. Given there is some uncertainty around the material properties on site the PRC plan should include a commitment to further material testing. Conservatively, to ensure appropriate rehabilitation is planned for under all scenarios, the PRC plan should include a design concept for a cover system should PAF material be present.	1. Update the PRC Plan to include: • A proposal for additional material testing once operations commence. • Design concepts of a cover system as a conservative approach to potential PAF management.
21.	3.5.6.3 Landform design	Habitat features It is stated that logs will be placed as habitat, but there is little information regarding their source and management. It is important for the PRC plan to detail how habitat features will be included to ensure they are being utilised in a way that best supports the PMLU.	1. Update the PRC Plan to incorporate the following activities: • Logs should be salvaged during clearing for mining activities and stockpiled for rehabilitation both on void

			edges and in rehabilitated native vegetation. Processes used to ensure that logs are stockpiled and available for installation in rehabilitation sites.
22.	3.5.6.3 Landform design	Erosion assessment Erosion assessment discussed in Section 3.5.6.3 has not been provided in full. The details of the erosion assessment undertaken are essential for understanding the modelling used to underpin any conclusions drawn in the PRC plan and understanding any risks to the final landform. It is also essential in developing the milestone criteria for the Schedule as it relates to erosion.	1. Provide the erosion assessment/WEPP modelling report in full as an appendix to the PRC Plan.
23.	3.5.6.3 Landform design	Highwall stability Section 3.5.6.3 describes the proposed reshaping of highwalls to achieve a slope gradient of 18 degrees in the upper strata. No information has been provided to demonstrate that these slopes will remain erosionally stable. Further information is required to demonstrate that these slopes, which are likely to include highly erodible materials at or close to the surface, will be stable. All assessment of erosional stability for these areas should include consideration of the erodibility of the materials present and its ability to support sufficient vegetation growth, noting that “weathered material tends to have a higher EC value than the fresh material.” (Section 3.5.6.1). The PRC plan must demonstrate that the rehabilitation methods proposed will result in a stable landform, and underpin the milestone criteria applied to the highwall.	1. Update the PRC Planning Part and provide updated erosion assessment/modelling that demonstrates the proposed battered down highwall areas can be expected to remain erosionally stable, with consideration given to slope geometry, material properties, and realistic appraisal of groundcover.
24.	3.5.6.3 Landform design, Schedule	Erosion criteria Rehabilitation milestone criteria do not sufficiently reflect findings of erosion assessment. The erosion assessment discussed in Section 3.5.6.3 found that a minimum level of groundcover was required to ensure erosional stability. This finding should be reflected in all relevant milestone criteria, and further, all milestone criteria should reflect the conditions and parameters applied in the erosion assessment and associated modelling to achieve a stable landform.	1. Update the PRC Plan and schedule to include SMART criteria to manage erosion in accordance with the findings of the erosion assessment.

25.	3.5.6.3 Landform design	Ramp stability Given the landform design, and the ability for cattle to access certain areas, there are concerns regarding erosion on ramps down to the pit lakes. This is of particular concern for the Mine A area. The PRC plan should contain a discussion of any specific measures that will be put in place to ensure that sloping areas able to be accessed by cattle will remain erosionally stable. This is to ensure that the PMLU of grazing is appropriate and achievable for these areas.	1. Update the PRC Planning Part to address concerns around erosion risk of ramps down to the pit lakes.
26.	3.5.6.4 Revegetation	Rehabilitation Areas (RAs) Figure 39 (Rehabilitation areas) does not include RA9. As the Rehabilitation Areas Map is a mandatory inclusion in the PRCP Schedule, the Figure must include all RA's relevant to the schedule.	1. Update the PRC Plan to include RA9 in Figure 39.
27.	3.5.6.5 Hydrogeology	Groundwater Dependent Ecosystem (GDE) Figure 46 shows the predicted drawdown post-mining equilibrium, which shows that a drawdown of approximately 1 to 4 metres is likely to occur at a potential GDE area located 4 km from Mine A final void. This potential GDE is mapped as a high ecological significance (HES) wetland. Conclusions in the Groundwater Impact Assessment (Appendix E) state that based on the evidence available to date, it cannot be conclusively stated that the groundwater system is not continuously saturated from the area below the potential GDE (at RL165 mAHD) to the regional groundwater system (at an elevation of 110 to 89 mAHD). However, it is considered most probable that the ridgeline and the potential GDE is underlain by a perched groundwater system and the drawdown from mining operations has a very low risk of impacting groundwater levels beneath the potential GDE. Provide information on any monitoring of this GDE that will be undertaken as part of the PRCP. This should be included in section 3.7.1.	1. Update the PRC Plan to include: Monitoring of potential drawdown impacts to the HES wetland (GDE) to the east of Mine A final void.

28.	3.7.1 Monitoring methodology	Monitoring of GDEs This section does not include any monitoring of potential GDEs identified on site, or within the drawdown impact area of the project site. It is acknowledged that one confirmed GDE will be impacted directly by mining activities. However, the other confirmed GDE on Charlevue Creek, and the potential GDE associated with the HES wetland (as discussed in item 28 above), should be monitored for drawdown impacts during closure activities.	1. Update the PRC Plan to address GDE monitoring.
29.	3.7.1 Monitoring methodology	Monitoring sites	1. Update the PRC Plan to provide all the required information on proposed analogue monitoring

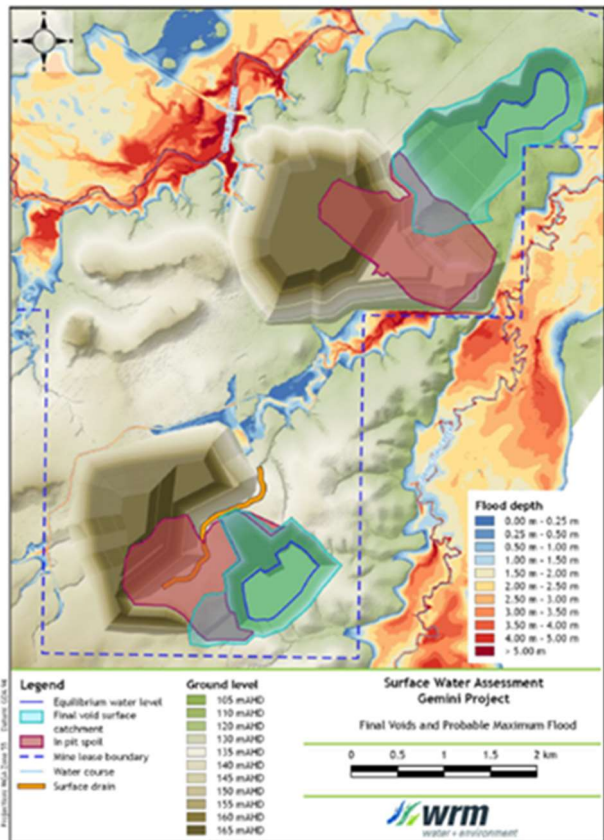
		The PRC plan does not provide sufficient detail on the analogue/ reference sites for rehabilitation monitoring. Parts of section 3.7.1 cattle grazing is referred to as the only pre-mining land use, however other sections concede that native vegetation communities are also in the landscape pre-mining. Section 3.7.1 should clearly nominate distinct analogue reference sites for each of cattle grazing and native vegetation communities. The section should make clear how many analogue sites will be developed for each pre-mining use, and provide their locations and a description of the current conditions, supplemented with photographs where possible. Section 3.7.1 on page 153 states 'periodic monitoring of reference sites will provide an understanding of the pre-mining landscape, assisting in the future planning and refinement of rehabilitation strategies' which indicates that the reference sites should already be defined and all information should be included in this PRC plan. It is important for the department to understand the condition of the analogue monitoring sites to ensure that monitoring rehabilitation against these sites will indicate achievement of the desired PMLU.	sites. This should include, at a minimum: - the number and location of sites, - the proposed frequency of monitoring, - The pre-mining land use that the PMLU will be compared to - Photographs of the current condition of the analogue sites.
30.	3.7.1 Monitoring methodology	Analogue sites Ground cover and species richness criteria is proposed to be within 2 standard deviations of equivalent analogue sites. As addressed in item 30, more information is required about the analogue sites or the sampling regime that will produce this data. Two standard deviations would potentially lead to accepting outcomes that are too variable and/or too poor.	1. Update the PRC Plan and schedule and supply sampling and monitoring plans and analogue site locations or benchmarks.
31.	3.7.1.6 Recruitment	Recruitment This definition (<5cm dbh), which comes from the BioCondition manual, may not be a suitable way to distinguish recruits from the sown vegetation, at least not until the final milestones, as slow-growing species amongst those originally sown may themselves not have attained that girth. The PRC plan and schedule should discuss alternative recruitment indicators that could be used, including low height relative to others of the same species, occurrence of species not in the original seed mix, and/or evidence of flowering/fruitletting. This is important to track the success of rehabilitation against all milestones.	1. Update the PRC Plan and schedule to revise the recruitment criteria.

32.	3.7.1.9 Satellite-derived fractional vegetation cover	Satellite-derived fractional vegetation cover The PRCP Schedule criteria state that satellite-derived fractional vegetation cover will be monitored. The PRC plan must describe the sampling and method to achieve this criteria. Ensure the vegetation type of reference sites is the same/similar to the rehabilitation's target vegetation type.	1. Update the PRC Plan to include details of sampling methods, including a discussion of the following: • Are reference polygons sufficient and comparable and data collected at the same time? • How much variability within the RA is acceptable?
33.	3.7.1.10 Fauna habitat assessment	Fauna habitat monitoring No details of monitoring are provided in this section. The details of the monitoring program for fauna habitat should be provided in full within the PRC plan to ensure that the fauna habitat PMLU is achieved.	1. Update the PRC Plan and schedule to include details of fauna habitat monitoring, including criteria to monitor success.
34.	3.7.3 Surface water and groundwater monitoring	Surface water monitoring It is noted in this section that surface water monitoring is proposed to be sampled every year during the wet season, following a flow event. The purpose of the water quality criteria is to demonstrate that the PMLU is stable and non-polluting. Therefore, whether there are any short term/medium and long term effects from the PMLU on the receiving environment surface water and groundwater quality is required as part of the PRCP. The ephemeral nature of the creeks is acknowledged, however, one sample per year is not sufficient to demonstrate that the final landform is stable over short timeframes. The suggested frequency is monthly during flow. If there is no flow during the month then no sampling is required. However, if there is flow during a month then a sample is required. This is to ensure that enough data will be collected at appropriate intervals to provide certainty that the final landform will be non-polluting.	1. Provide an updated PRC Plan that specifies frequency of water quality monitoring at sufficient intervals to consider seasonal variation and be able to gather data to demonstrate a stable and non-polluting condition has been achieved.

35.	3.7.3 Surface water and groundwater monitoring	Water quality parameters This section provides a list of the quality characteristics tested for surface water and groundwater monitoring. However, the quality characteristics are not consistent between surface water and groundwater. As mentioned earlier, the contaminants of concern (CoC) analysis should justify the parameters tested, and should be consistent between both.	2. Update the PRC Plan to include a consistent list of quality characteristics for monitoring both surface water and groundwater quality, based on the outcomes of the CoC analysis.
36.	3.7.4.4 Statistical analysis	Statistical tests T-tests are recommended to compare between means of analogue and rehabilitation sites (or a comparable nonparametric test). However, small sample sizes are likely to mean that statistical tests can't be appropriately applied and, in any case, several completion criteria are concerned with meeting thresholds, or falling within a range of values, and do not depend on demonstrating statistical similarity to analogue sites. It is necessary, however, to consider the level and range of variability that are acceptable within assessment areas to satisfactorily meet milestone and completion criteria. When using BioCondition, an average score with a standard error equivalent to no more than 5% of the BioCondition scoring range is practicable (Accounting for Nature 2022). Reference: Accounting for Nature (2022). Appendix 7. How many BioCondition sites are needed for vegetation asset accounts at property or regional scales? <i>Accounting for Nature Guidelines for developing Methods to assess Native Vegetation Condition – v1.0.</i> https://www.accountingfornature.org/key-documents	1. Update the PRC Plan and reconsider how reference and rehabilitation sites are compared.
37.	Appendix E: Gemini Project – Surface Water Assessment (WRM, 2019) Appendix A Flood impact assessment	Hydrology & Hydraulic Models for Flood Estimation Further details are required to understand the models used for flood estimation, with underpin Appendix A and Appendix E including model setup, parameterisation, calibration, and validation using local data. While the XP-RAFTS hydrology model was used, additional details on calibration using local data are required to meet the requirements of Section 41C of the Environmental Protection Regulation 2019. Section A2.7 states: “<i>The peak design discharges produced by the XP-RAFTS model were validated against the Rational Method and Regional Flood Frequency Estimation (RFFE) estimates.</i>” However, validating the model using the Rational Method, while itself is a simpler	1. Update the PRC Planning Part to include detailed explanations of the hydrology model setup, including parameterisation, calibration, and validation, using site-specific catchment parameters aligned with Australian Rainfall and Runoff (ARR) guidelines (2019).

		and uncalibrated/unvalidated model/equation, is not best practice. While corroboration with RFFE (regional data) is better, the absence of site-specific calibration must be addressed.	
38.	Appendix E: Gemini Project – Surface Water Assessment (WRM, 2019) Appendix A Flood impact assessment	Hydrology & Hydraulic Models for Flood Estimation Further detail is required on how long term climate projections have been integrated into the flood estimation. Projections based on IPCC Representative Concentration Pathways (RCPs) should evaluate long-term climate impacts on flood estimation, ensuring compliance with Section 3.4.1 of the PRCP Guideline. While climate change projections seem to have been used for water balance modelling, they have not been integrated into flood estimation. This is important to understand how the final landform features may perform under expected future scenarios.	1. Update the PRC Planning Part to incorporate future climate projections into flood estimation as required by ARR 2019, considering increased rainfall intensity and higher frequency of extreme events.
39.	Appendix E: Gemini Project – Surface Water Assessment (WRM, 2019) Appendix A Flood impact assessment	Hydrology & Hydraulic Models for Flood Estimation The justification for using 30m LiDAR data from ELVIS for topography should be explained. This resolution is relatively low for floodplain modelling and may not adequately capture the required details, such as dimensions of the final landform or flood levels during operations and at closure, where including dimensions of temporary and permanent diversions are required.	1. Update the PRC Planning Part and explain why 30m LiDAR data was used for floodplain modelling.
40.	Appendix E: Gemini Project – Surface Water Assessment (WRM, 2019) Appendix A Flood impact assessment	Floodplain modelling and mapping Floodplain modelling must adhere to Australian Rainfall and Runoff (ARR) guidelines (2019). Pits AB and Pit C locations pre-mining are influenced by all flood events as shown in the maps submitted in '20190926 Surface Watr Assessment including Appendix (FINAL).pdf'. However, these maps are required to be updated to include the impact of climate change on flood estimation to align with ARR guidelines.	1. Update the PRC Planning Part and incorporate climate change impacts on flood estimation in accordance with ARR 2019.
41.	Appendix E: Gemini Project –	Flood and floodplain modelling	1. Update the PRC Planning Part to include:

	Surface Water Assessment (WRM, 2019) Appendix A Flood impact assessment	The PRC plan should address probably maximum flood scenarios and demonstrate how flood levels under a PMF may interact with the final landform. Flood levels up to PMF must be presented, incorporating climate change impacts. Shear stress, stream power, and velocity data must also be included to inform the design of diversions and related infrastructure (temporary and permanent). This to evaluate the risks to the PMLU under all flood scenarios and ensure that where required, milestone criteria are developed to ensure the final landforms will withstand these events.	• PMF flood levels, incorporating climate change impacts • Shear stress, stream power and velocity data to inform diversion/infrastructure design.
42.	Appendix E: Gemini Project – Surface Water Assessment (WRM, 2019) Appendix A Flood impact assessment	Floodplain modelling and mapping The flood maps for the final landform under PMF conditions (Figure 8.2) do not account for levees or permanent diversions. It appears that the final landform flood plain map has been developed for pre-mining and using the pre-mining flood map. The flood modelling for the final landform must use topography and landform of the final landform in the simulation. This requires clarification. While flood depths exceed 5m at the edge of the dump (and adjacent to 'In pit spoil'), the absence of barriers and potential erosional and structural instability is unexplained. Modelling setups for these scenarios should be clarified, and the stability of the final landform and voids must be demonstrated.	1. Update the PRC Planning Part to include: • Clarification for modelling setups, including how they account for levees and/or diversions. • Rehabilitation strategies for the final landform and voids located within the floodplain to achieve safe and stable landform. • Clarify if Figure 8.2 is developed by flood modelling for the final landform or mapping the final landform on the pre-mining flood map.

		 Figure 8.2 - Final landform and flood levels in Probable Maximum Flood	
43.	Appendix E: Gemini Project – Surface Water Assessment (WRM, 2019)	Diversions The PRC plan specifies a permanent clean water diversion for an unnamed tributary of Springton Creek, designed to channel clean water around the final landform dumps and voids. Temporary watercourse diversions are also in place during operations. While the minor tributaries may not meet the definition of a watercourse under the <i>Water Act 2000</i>, diversions of natural surface waters should follow the general principles of the “Works	1. Update the PRC Planning Part to include: Map of the proposed diversions, clearly showing the original drainage line location

	Appendix A Flood impact assessment	<i>that interfere with water in a watercourse for a resource activity” guideline. This is reinforced in the Gemini EA application material, which states:</i> <i>Although neither of these tributaries are defined as watercourses under the Water Act, the drainage works will be designed and constructed generally in accordance with the design principles set out in the guideline; Works that interfere with water in a watercourse for a resource activity – watercourse diversions authorised under the Water Act 2000 [OSW/2019/4599] (DNRME 2019). Materials used for levee construction and other civil purposes will be subject to civil engineering testing to meet appropriate design requirements.</i> Diversions should meet the following principles of the guideline, at a minimum: • Maintain the natural hydrological and hydraulic characteristics of the original watercourse. • Maintain natural geomorphic and riparian vegetation similar to the original watercourse. • Maintain a sediment transport regime, with minimal impact on sediment deposition or erosion. • Achieve equilibrium condition. • Minimise erosion and avoid increasing flood risks. • Provide an appropriate floodplain corridor width to accommodate natural processes. • Be designed to be self-sustaining, requiring minimal ongoing maintenance. • Be integrated into the overall rehabilitation plan. • Be considered in floodplain modelling to assess the impact of diversions on flood behaviour and ensure stability of the final landform. • Include structural stability analysis if located through spoil. • Be designed to be hydraulically and structurally stable, e.g., through armouring. Section 3.5.6.3 states that the diversions will be permanent. The PMLU for RA8 (diversions) is listed as ‘grazing’ in Table 22, ‘grazing/native ecosystem’ in section 3.5.6.4, and ‘native vegetation supporting fauna habitat’ in the PRCP schedule. Satellite imagery shows that the majority of the original drainage lines contain trees along the alignment.	and the proposed diversion location. • Clarification around the PMLU for the diversions. The common approach for diversions is a PMLU of ‘watercourse / drainage line’, aiming at establishing the pre-mining drainage feature (or as close as possible) • Aligned with “Guideline: Works that interfere with water in a watercourse for a resource activity—watercourse diversions authorised under the Water Act 2000”, demonstrate that proposed diversions maintain the natural hydrological, hydraulic, and sediment transport regimes of the original watercourse. Include compliance assessment with Watercourse Diversion Guidelines. • Ensure diversions are designed to be self-sustaining and align with progressive rehabilitation goals. Justify whether structural stabilisation (e.g., armouring, revegetation) is needed.
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		In accordance with the watercourse diversion guideline, permanent diversions should be rehabilitated as closely as possible to the original surface water feature. Good design and high vegetation cover on banks, including deep rooted plants, is important for the long-term stability of the drainage feature. While there are detailed designs of the diversions included in the PRC Plan (Figure 42 and 43), there are no maps identifying the length of the natural drainage lines that will be impacted, and how the diversions are situated in relation to their original alignment. The details of the diversion should be discussed in detail in the PRC plan. This should include how the diversion has been designed to satisfy the above mentioned criteria, and propose a suitably justified PMLU for the diversion. Appropriate milestone criteria should be included in the PRCP Schedule to monitor and assess the successful operation of the diversion so that it may replicate the natural system as close as possible.	
44.	Appendix E: Groundwater Impact Assessment (JBT Consulting, 2019)	Groundwater Modelling Section 6 discusses the groundwater modelling used for Gemini Coal Mine. It is not clear whether the water level data from the extensive network of monitoring bores has been used to calibrate the groundwater model. The water level data has not been incorporated in the groundwater model, and limitations of this approach should be clearly identified and discussed. A justification should also be provided as to why this information has not informed the groundwater model.	1. Update the PRC Planning Part and include whether observed water level data from the monitoring bores was used to calibrate the model and if not, what limitations this places on the modelling.
45.	Appendix E: Groundwater Impact Assessment (JBT Consulting, 2019)	Unknown reference Section 6.1 states: <i>Seep/W has been used in this study to predict the rate and extent of change to the phreatic surface in response to the ongoing mining of the already approved Central North Mine, as well as the proposed extension of the operation into the extension area.</i> There is no other mention of Central North mine in the document, it is not clear where the mine is located. All other mines considered in the context of cumulative impacts which may influence the rehabilitation of the site and the closure outcomes should be discussed in detail in the PRC plan.	1. Update the PRC Planning Part and explain where the Central North mine is and how it has been incorporated into the modelling.

46.	Appendix E: Groundwater Impact Assessment (JBT Consulting, 2019)	Links between groundwater model and surface water model Section 6.2 notes that the WRM2019 average modelled water levels for the two voids have been used as boundary conditions for the post mining groundwater model. However, it appears that under the methodology used there is no allowance for using the water balance predicted surface water levels to refine the groundwater modelling as would normally occur with a numerical groundwater model as an iterative process between the two models. More information is required about the modelling approach taken to affirm the reliability of the modelled outcomes.	1. Update the PRC Planning Part and explain: • why there was no iterative process used linking the surface water model and the groundwater model to refine the groundwater modelling; and • the impact this has had on the groundwater and surface water modelling.
47.	Appendix E: Groundwater Impact Assessment (JBT Consulting, 2019)	Water level contours Section 6.5.2 states: <i>The initial phreatic surface was generated in the steady state model by applying fixed heads at the boundaries of the model. The boundaries were set at a distance of approximately 10 km from the edge of mining in order that the boundary conditions did not interfere with the groundwater response to mining, with the boundary conditions set to place the water level within the Tertiary sediments at levels observed from the groundwater monitoring bores for each mining area.</i> However, no contours are provided to demonstrate these initial heads so they can be compared with observed heads. More information is required about the modelling approach taken to affirm the reliability of the modelled outcomes.	1. Update the PRC Planning Part and provide water level elevation contours showing the initial water levels used in the steady state model and identify which geologic unit they represent.
48.	Appendix E: Groundwater Impact Assessment (JBT Consulting, 2019)	Predicted groundwater level elevation contours Section 6.6 provides no predicted groundwater level elevation contours for the end of mining or at post mining equilibrium for the major geologic units. These are expected to be provided to demonstrate the relationship between the predicted long term void levels and the long-term groundwater level elevations in the major geologic units and clearly demonstrate sink or source behaviour of the voids. This information is critical to understanding long term outcome for the voids, and affirming whether the voids can be expected to be non-polluting post closure.	1. Update the PRC Planning Part and provide: • predicted groundwater elevation contours for the end of mining and post mining in the major geologic units. • Clearly demonstrate sink or source behaviour of the voids

49.	Appendix E: Groundwater Impact Assessment (JBT Consulting, 2019)	Predicted drawdown extents In section 6.6.1, Figure 6-8 provides the predicted extent of the 2 and 5 m drawdown at post mining equilibrium and Figure 6-7 provides the predicted extent of 2 and 5 m drawdown at the end of mining. It is not clear which geologic unit these predictions relate to. It is noted that despite the very small volumes of groundwater inflow predicted post mining (section 6.6.2) the predicted drawdown extents of both the 2 and 5 m drawdown lines post mining (Figure 6-8) are located at a greater distance from the mine than the end of mining predicted drawdown extents. It appears unusual that if the predicted groundwater inflow to the voids post mining has greatly reduced why the extent of predicted drawdown should increase. Additionally, it is not clear if the model is able to provide the predicted maximum drawdown at specific bore locations should specific water level triggers be required at specific compliance bores. Predicted drawdown should be provided at regular contour intervals, rather than focusing on the 2m and 5m limits in the EA. <i>Table E3 – Groundwater level triggers</i> in the EA is provided as an interim measure of protection, however the groundwater level triggers should eventually be changed to be bore specific and reflect the total predicted drawdown at each site. There is a high chance of non-compliance using the current table when the development of the pits cause drawdown exceeding 2m in a year. Following the finalisation of the PRCP schedule, the EA is updated to remove conditions that relate to rehabilitation and the monitoring networks will be aligned between EA and PRCP. Predicted drawdown mapping should also be provided for each hydrogeological unit. It is unclear which hydrogeological unit Figure 6.7 and 6.8 are based on (assumed to be the coal measures).	1. Update the PRC Planning Part and include: • Why the extent of predicted drawdown increases post mining. • Whether the model is able to provide the predicted maximum drawdown at specific bore locations should specific water level triggers be required at specific compliance bores. • Predicted drawdown maps for each hydrogeological unit with regular contours, rather than using just 2m and 5m contours. Drawdown modelling should determine: • the potential drawdown in shallow sediments (tertiary sediments and the alluvium) • Connection between the shallow sediments and layers below • Impact of baseflow of creeks and GDEs.
50.	Appendix E: Groundwater Impact	Recharge rate applied to the spoil Section 6.6.2 states: <i>In addition, the rate of recharge to the spoil occurs at a rate that is higher than the natural ground, allowing a water table to develop within the spoil.</i>	1. Update the PRC Planning Part and explain what recharge rate was applied to the spoil in the groundwater model.

	Assessment (JBT Consulting, 2019)	However there appears to be nowhere in the report where the rate of recharge to the spoil is provided. The rate of recharge applied to the spoil can have a significant impact on the predicted inflows to the final voids. The PRC plan should discuss recharge to the spoil in more detail to provide complete information on inflows to the final voids.	
51.	Appendix E: Groundwater Impact Assessment (JBT Consulting, 2019)	Groundwater inflow to voids Section 6.6.2 states: <i>For the post-mining years the net groundwater inflow rate is zero, as the rate of inflow from the pit walls above the backfilled area of spoil and the final void lake occurs at such a low rate that the rate of evaporation is significantly greater than the modelled rate of inflow.</i> It is unclear from this statement if there has been an allowance for groundwater inflow through the saturated walls of the final void and up through the sides and bottom of the spoil in the backfilled pits. The PRC plan should identify all sources of groundwater inflow to provide complete information on inflows to the final voids.	1. Update the PRC Planning Part and explain whether an allowance been made for the inflow from groundwater through the saturated sides of the voids and through the walls and base of the backfilled areas of the voids.
52.	Appendix E: Surface Water Assessment (WRM, 2019)	Groundwater inflow and final void salinity Section 8.8 states: <i>Ground water investigations by JBT Consulting indicate that due to partial backfilling of the voids, groundwater inflows to the final voids are expected to be negligible.</i> Section 8.10 provides details of the salinity of three components of inflow to the voids and the salinity adopted for those components. Groundwater quality is not considered in this analysis. This is considered significant as it is noted in the groundwater impact report, Section 4.3, that groundwater quality ranges from 15,200 to 28,500 $\mu\text{S}/\text{cm}$. Given the limited linkages between the surface water modelling and the groundwater modelling, the significant gradients between pre mining groundwater levels and the predicted final void levels and the very low predicted groundwater inflows to the voids post mining using the SEEP/W model (despite predicted increasing areas of groundwater impacts post mining) there is doubt over the post mining final void conditions and in particular the predicted salinity in the voids post mining.	1. Update the PRC Planning Part and include: • a sensitivity analysis of the impacts on void salinity of groundwater inflow occurring in the final voids post mining; and • a time frame for the development of a 3D numerical groundwater model and updated surface water model. 2. Provide the numerical groundwater model under development in accordance with condition E4 of the EA.

		As a result of these concerns, it is considered that initially a sensitivity analysis should be conducted to determine the impact of groundwater inflow into the final voids on final void salinity. Longer term it is considered that a three-dimensional numerical groundwater model should be developed in conjunction with an updated surface water model. It should be noted, condition E4 of the EA requires a numerical groundwater model as part of the groundwater monitoring program, within 6 months of the grant of ML700056. The ML was granted on 12 September 2024, therefore the groundwater monitoring program, including the numerical groundwater model, must be completed by 12 March 2025. It is assumed that numerical groundwater model is still underdevelopment at the time of this information request, but will become available within the RFI response period.	
PRCP Schedule			
53.	RM8	Soil criteria Soil pH criteria of as low as 4.5 is not supported by technical specialists. A soil pH of less than 5.5 is considered strongly acidic. The development of strongly acidic soils (less than 5.5 pH) can result in poor plant growth as a result of one or more of the following factors: • aluminium toxicity • manganese toxicity • calcium deficiency • magnesium deficiency • low levels of essential plant nutrients such as phosphorus and molybdenum. The soil limits for EC and ESP in the PRCP schedule are supported. The criteria of ESP % <6 is proposed for a depth of 0-10cm, however the proposed topsoil depth is 0.2m. Clarification is required to explain the choice of depth for this criteria.	1. Update the PRCP schedule to provide a more suitable pH range that will facilitate successful plant growth. 2. Update the PRC Plan to clarify why the ESP limit does not apply from 0-20cm, or adjust the schedule accordingly.
54.	RM8	Topsoil depth It is noted in the Gemini Coal Mine EA application that a recommended minimum topsoil depth of 0.3 m is stated, and that adequate topsoil material will be available on site to meet	1. Update the PRCP schedule to reflect previous commitment to

		this requirement (section 4.2.4). The recent estimated rehabilitation costs (ERC) application for Gemini Coal Mine also accounted for the costs associated with 0.3 m of topsoil application for rehabilitation areas. DETSI has previously commended Magnetic South on this approach, and has factored this approach into the ERC assessment. However, the PRCP criteria only commits to a topsoil depth of 0.2 m.	topsoil application for rehabilitation of Gemini Coal Mine.
55.	RM18	Diversions There is no criteria specific for measuring the success of the rehabilitated diversions to the surrounding natural watercourses / drainage features. Consideration should be made for providing a milestone for achievement of stable PMLU for the rehabilitated drainage line. This milestone should have consideration for stability of bed and banks, and supporting self-sustaining native vegetation typical of riparian areas. Criteria relating to reference sites and Index of Diversion Condition (IDC) could be considered.	1. Update the PRCP schedule to include SMART criteria for the achievement of PMLU for the diversions, including quantitative measures of comparing the diversion with the surrounding drainage lines. The PMLU for diversions should be 'watercourse' or similar.
56.	RM9, RM11 and RM12	Seed mixes The criteria proposed in the PRCP Schedule requires seeding with minimum 6 native trees/shrubs and 4 native ground cover species. This is considered insufficient species richness to achieve suitable native vegetation outcome that resembles a regional ecosystem.	1. Update the PRCP schedule to augment the species mix with additional species from local regional ecosystems (REs). REs 11.7.2 and 11.5.2 would be considered appropriate for this site.
57.	RM10	Seed mixes The criteria proposed in the PRCP Schedule states that seed mix (grazing RAs) should comprise a minimum of 25% native pasture species, and include a minimum of 3 x 3P native species. DETSI recommends a higher proportion of native seeds being used in the grazing mix, which is important for resilience, species diversity and foraging opportunities for conservation significant species known to the area. DETSI does not support the use of <i>Bothriochloa pertusa</i> (Indian bluegrass) in Table 25 for the grazing seed mix. This is a highly invasive species and is listed as an environmental weed.	1. Update the PRC Plan and schedule to: - increase the proportion of native species used in the grazing seed mix - remove <i>Bothriochloa pertusa</i> from any seed mixes.

58.	RM11 and RM18	Revegetation In general the revegetation criteria do not consider other factors which may influence rehabilitation success of the larger PMLU. This includes management of the presence of cattle in PMLU landscape. The revegetation criteria should also address purpose of revegetation to deliver broader enhancement of the fauna habitat values associated with areas of native vegetation, given the conservation value of the surrounding environment. <u>Impacts to littoral zones</u> There is no criteria demonstrating how cattle will be managed to prevent any adverse impacts to the littoral zones between the low wall and base of residual void. The PRCP Schedule should include specific criteria to address these impacts. <u>Native vegetation</u> The PCRCP Schedule specifically includes the criteria '>5 native species annually' This criteria is not SMART and will not demonstrate that the native vegetation is supporting adequate or representative fauna communities.	1. Update the PRCP schedule to include criteria to reduce impacts to revegetation of littoral zone. 2. Ensure rehabilitation criteria includes species and habitat elements conducive to the recolonisation of species of interest (e.g. squatter pigeon, greater glider) and monitor establishment of these features to demonstrate capacity of the rehabilitation to provide habitat for these species through time. 3. Ensure that monitoring described in the PRC plan is sufficient to track how similar the fauna communities of rehabilitated sites are becoming to those of reference sites through time. Bird communities are a good proxy for fauna recovery generally.
59.	RM14	BioCondition A BioCondition assessment is proposed but there is no regional ecosystem nominated for comparison, no benchmark or reference sites nominated, and no score to be achieved. An example of the BioCondition attributes that are relevant to mine rehabilitation is shown below:	1. Update the PRC Plan and schedule to include: • State which regional ecosystem(s) are guiding the species selection • what the relevant benchmarks are • which BioCondition attributes are to be assessed, and • what score is to be achieved at RM14. Page 153 lists several BioCondition attributes so this form of monitoring is

		Table 1. Modified BioCondition framework for mine site rehabilitation monitoring <table><tr><th colspan="2">Attribute</th><th>Weighting %</th></tr><tr><td>a</td><td>Tree canopy height</td><td>5</td></tr><tr><td>b</td><td>Recruitment of canopy species</td><td>5</td></tr><tr><td>c</td><td>Tree canopy cover (%)</td><td>5</td></tr><tr><td>d</td><td>Shrub cover (%)</td><td>5</td></tr><tr><td>e</td><td>Native¹ plant species richness for four life-forms</td><td>20</td></tr><tr><td>f</td><td>Non-native plant cover</td><td>10</td></tr><tr><td>g</td><td>Native perennial (or preferred & intermediate) grass cover (%)</td><td>5</td></tr><tr><td>h</td><td>Organic litter cover</td><td>5</td></tr><tr><td colspan="2">Total</td><td>60</td></tr></table> ¹ Native species occurring naturally in a site identified by a suitably qualified person as a target Regional Ecosystem and/or listed in a target Regional Ecosystem technical description. The PRC plan is required to include further details on the parameters of the BioCondition monitoring specific to the nominate regional ecosystems types to be achieved. This information in the PRC plan will then underpin the BioCondition framework included as an appendices to the PRCP Schedule.	Attribute		Weighting %	a	Tree canopy height	5	b	Recruitment of canopy species	5	c	Tree canopy cover (%)	5	d	Shrub cover (%)	5	e	Native ¹ plant species richness for four life-forms	20	f	Non-native plant cover	10	g	Native perennial (or preferred & intermediate) grass cover (%)	5	h	Organic litter cover	5	Total		60	envisaged, but it is preferable that BioCondition-based monitoring be explicitly used so that milestone criteria can be measured against established benchmarks.
Attribute		Weighting %																															
a	Tree canopy height	5																															
b	Recruitment of canopy species	5																															
c	Tree canopy cover (%)	5																															
d	Shrub cover (%)	5																															
e	Native ¹ plant species richness for four life-forms	20																															
f	Non-native plant cover	10																															
g	Native perennial (or preferred & intermediate) grass cover (%)	5																															
h	Organic litter cover	5																															
Total		60																															
60.	RM16	Littoral zone ≥ 50% of seeded/planted semi-aquatic or inundation-tolerant species in littoral zone proposed as a criteria. As no target regional ecosystem is designated or reference site indicated, it is difficult to determine if this is an adequate level of species richness. As only 11 species are listed in Table 28 (p 104), only six species would be needed to meet this criteria and that seems low. Further information is required in the PRC plan to identify target regional ecosystems, and relevant reference sites. This information is required to enable suitable milestone criteria to be developed.	1. Update the PRC Plan and schedule to address the following: - state which regional ecosystem is guiding the species selection, - what the relevant benchmarks are, - which BioCondition attributes are to be assessed, and - what score is to be achieved.																														

61.	RM18	Species richness Species richness targets are given but no sampling regime described and, on their own, species richness targets are not sufficient to demonstrate achievement of the PMLU. As recommended in item 59, it is strongly recommended that the BioCondition approach is adopted.	1. Criteria are not SMART. It is recommended that BioCondition-based criteria is used in the schedule.
62.	RM20	Fauna habitat criteria The PRCP Schedule includes the criteria 'Evidence of native species inhabiting or utilising pit lakes'. This criteria does not meet the SMART principles and as discussed in the PRC Plan section of this request, the PRC plan does not contain sufficient information to demonstrate the efficacy of the proposed fauna habitat PMLU, nor the methods for monitoring and managing the success of this proposed PMLU. This criteria is not SMART and will not demonstrate that the voids are supporting adequate or representative fauna communities.	1. Develop SMART criteria that demonstrate the achievement of the fauna habitat PMLU.
63.	RM20 and RM23	EA references The PRCP Schedule criteria when finalised will not refer to sections of the environmental authority. References to the requirements of the EA included in RM 20 and RM23 should be replaced with data in an appendix which will be attached to the PRCP Schedule itself.	1. Update the PRCP schedule to refer to data in an appendix, rather than sections of the EA.
64.	RM23	Groundwater level thresholds The groundwater trigger thresholds in the EA are not appropriate for use in the PRCP schedule. The groundwater trigger thresholds should be based on groundwater drawdown modelling and present the maximum drawdown level.	1. Update the PRCP schedule to provide a separate list of groundwater level thresholds for inclusion as an appendix to the schedule, based on the groundwater drawdown modelling.
65.	RM23	Water quality limits As stated earlier, surface water and groundwater quality limits should be based on site-specific data and CoC analysis. The limits in the EA are for operational purposes, and not necessarily relevant for post-closure.	1. Update the PRCP schedule to provide water quality limits as separate tables for inclusion as an appendix.