Notice

Environmental Protection Act 1994

Information request

This information request is issued by the administering authority under section 140 of the Environmental Protection Act1994 (Qld) to request further information needed to assess an application for a PRCP schedule.

To: BHP Coal Pty Ltd
QCT Management Pty Limited.
Mitsubishi Development Pty Ltd.
Umal Consolidated Pty Ltd.
QCT Mining Pty Ltd.
QCT Investment Pty Ltd.
BHP Queensland Coal
Investments Pty Ltd.

Level 14, 480 Queen Street,
Brisbane City Qld 4000.

ATTN: Trudy Mazucco

Our reference: EPML00865013

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 1 October 2024.

The application reference number is: A-PRCP-NEW-100733349

Land description: ML1782 ML70126 ML70127 ML70325 ML70328 ML70350 ML70369 ML70370 ML70410

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 **11 June 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/action, 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.

11/12/2024

Signature

Date

Cate Puschmann
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

Attachments

Information sheet: Internal review and appeals (ESR/2015/1742)

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
PRC Planning Part			
Spatial data			
1	**Spatial data**	**Missing specifications** The spatial identifies the only sensitive receptors as 'watercourse'. The NUMA area and improvement area are identified in one polygon, but the polygon does not delineate between the NUMA components such as the void water body, high-wall area, safety bund area. Voids in the floodplain are shown however the entire extent of the floodplain is not shown.	**Provide a spatial data –** a) That clearly delineates each NUMA area components including void, high-wall, safety bund and other critical components; and b) Polygons depicting the full floodplain extent to support a comprehensive flood risk assessment for the entire site.
Surface water			
2	**Water Management, PRC plan section 6.1.7**	**Water management** The section overall concludes that waste material indicates low AMD potential and seepage is likely to flow towards residual voids as the landform is designed to be free draining. The section does not provide sufficient information on pro-active measures to be adopted to monitor and ensure flow direction of seepage towards residual voids.	**Provide a revised PRC plan inclusive of –** a) A description of proactive methods adopted to control the seepage direction and manage any deviations,

			b) Intervention and control measures to monitor and ensure seepage flows towards residual voids; and c) A monitoring and control strategy for seepage pathways, designed to maintain alignment with the intended landform drainage design.
3	**Surface water monitoring, PRC plan section 8.5.**	**Surface water quality monitoring data** Section 8.5 states that the surface water monitoring data currently held for the site is not suitable for the development of site-specific criteria. No surface water data has been provided as part of the PRCP application. Appropriate surface water parameters and limits must be included in the PRCP schedule. Site-specific values based on background water quality data are required to determine appropriate milestone criteria. Quality characteristics should be based on relevant contaminants of concern (CoC). CoC should be the same for surface water and groundwater and be based on mining process (dams and seepage) and waste characterisation.	**Provide a revised PRC plan that includes -** a) Revised sections to include surface water receiving environment quality data, b) Identification of the relevant contaminants of concern (CoC) for the site; and c) Suitable site-specific limits, based on Water Quality Objectives (WQO), ANZG 2018 guideline and background data.
Hydrogeology			
4	**Groundwater monitoring, PRC plan section 8.6**	**Groundwater monitoring data** Section 8.6 states that groundwater monitoring data currently held for the site is not suitable for the development of site-specific criteria.	**Provide a revised PRC plan and Appendix G –that includes -** d) Revised sections to include background groundwater quality data,

		Appendix G Hydrogeology, section 4.4 provides a summary of baseline water quality monitored on site through the existing groundwater monitoring network. The Appendix G does not provide information on the significance of existing monitoring bore locations, bore details such as depth, screening level etc. Additionally, raw monitoring data for all bores has not been provided. Appropriate groundwater parameters and limits must be included in the PRCP schedule. Site-specific values based on background water quality data are required to determine appropriate milestone criteria. Quality characteristics should be based on relevant contaminants of concern (CoC). CoC should be the same for surface water and groundwater and be based on mining process (dams and seepage) and waste characterisation. At least 8 data points are required to determine site-specific values in most cases. For groundwater, the 95th percentile of baseline (ideally pre mining) data can be used to determine site-specific limits for all indicators. As per the Groundwater Guideline if there are less than 8 data points or the site-specific value is less than the default ANZG 2018 value, then the default guideline value is applied as a limit. See DES 2021 Groundwater Guideline - https://www.publications.qld.gov.au/dataset/groundwater-quality-assessment-guideline/resource/472cc88a-000a-4bb8-a60d-204cfe7e0238	e) Existing monitoring bore details including type, location, depth, screening level etc, f) Identification of the relevant contaminants of concern (CoC) for the site; and g) Suitable site-specific limits, based on Water Quality Objectives (WQO), ANZG 2018 guideline and background data.

5	**Appendix D Hydrogeology Assessment, section 1.3**	**Objective** Section 1.3 outlines one of the key objectives for the hydrogeology assessment as, '*final void lake levels remain below shallow groundwater bearing units, i.e. there is sufficient freeboard to negate risk of void water discharge to any shallow groundwater system*'. The objective should be that the final void lake levels remain below groundwater levels in any adjacent groundwater bearing unit.	**Provide a revised Appendix D that's includes -** a) A review of the objectives to ensure the objective and subsequent modelling input are based on identifying if final void lake levels remain below groundwater levels in any adjacent groundwater bearing unit.
6	**Appendix D Hydrogeology Assessment, section 3.1**	**Geology, Table 3-1 Regional Stratigraphy** The German Creek Formation appears in Figures 3-2 and 3-3 and is discussed in Section 3.2.3 as being part of the Back Creek group. However, the German Creek Formation is not mentioned in Table 3-1. It would provide clarification to the geological background if the German Creek Formation was identified in Table 3-1 as being part of the Back Creek.	**Provide a revised Appendix D that includes -** a) A revised Table 3-1 to include a description of the German Creek Formation.
		Cross sections of each pit In the report there is discussion of the various formations, and the coal seams, targeted in different pits but with the exception of the conceptualisation diagram, there are no cross sections showing how each pit intersects the Moranbah Coal Measures and how each pit will be backfilled at the end of mining.	**Provide a revised Appendix D inclusive of** – a) Cross sections of the pits showing the formations and coal seams that will be intersected during mining and the backfilling that will occur.
7	**Appendix D Hydrogeology Assessment, section 4.1**	**Groundwater Monitoring** Table 4-1 provides details of the current groundwater monitoring network. It is considered a useful table with a good summary of the data available for bores identified in the table.	**Provide a revised Appendix D inclusive of** – a) A revised Table 4-1, reflecting information on the 19 additional bores

		However, in the Appendix E: Groundwater modelling technical report it is noted that a number of additional bores (19) at Saraji South have been used in the model calibration which are not identified in Table 4-1 of Appendix D. These additional bores are identified in Appendix B of the Groundwater modelling technical report. These additional bores range from SSM_MB205 to SSM_MB225. This information is considered important for inclusion in Appendix D Table 4-1 format as it supports the assessment of the hydrogeology and provides necessary information on those bores which were used to support the numerical groundwater modelling.	SSM_MB205 to SSM_MB225 used in the model calibration including water level, water quality and construction data available.
8	**Appendix D Hydrogeology Assessment, section 4.3**	**Groundwater distribution and flow** Section 4.3 states that, '*groundwater data for the Permian coal measures since 2004 are broken into observations associated with the coal seams, and those associated with the overburden and interburden*'. However, upon review of Figures 4-10 to 4-15 and Table 4-1 it becomes apparent that there is no water level data available for Permian bores prior to 2011. This is important as it can be misleading as to what groundwater level data is available for calibration of the model in the pre-2011 period.	**Provide a revised Appendix D to** Review and clarify the wording in Section 4.3.3 in regard to the period of groundwater level data available and provided in relation to the Permian coal measures.
9	**Appendix D Hydrogeology Assessment, section 5.1**	**Unsuitability of the groundwater at SSM for stock purposes** Section 5.1 states that, '*Groundwater within the coal measures at SSM is generally considered unsuitable for all stock types*.'	**Provide a revised Appendix D to** a) Review and clarify the statement that groundwater within the coal measures at

		However, it is noted that in Table 4-19 that a number of samples from Moranbah Coal Measures interburden and coal seam bores had Total Dissolved Solids levels between 1500 and 7000 mg/L indicating likely suitability for stock watering. Additionally, there are three landowner bores identified in Table 4-9 as taking water from the Permian. One is identified as 'Good Stock Bore'. It is important to accurately describe the existing and potential purposes of the groundwater in an assessment that is predicting impacts to those groundwater resources.	SSM is generally considered unsuitable for all stock purposes; and b) Review the available groundwater data to support or negate the above statement regarding unsuitability of groundwater for all stock purposes.
10	**Appendix D Hydrogeology Assessment, section 5.2**	**End of Mining** Section 5.2 states that, '*An understanding of the hydrogeological system response to mining, and conditions at the end of mining, is considered important in the context of defining the starting conditions for the post-mining assessment described later in this report*'. DETSI agree with this statement. Similar statements are made in section 6.1 of the report. However, the groundwater modelling described in this report and detailed in the groundwater technical report do not describe predictive modelling of the SSM from 2024, to the end of mining, although it is acknowledged that Appendix E in the Groundwater model technical report does provide the end of mining groundwater elevations. If a detailed description of predictive modelling of conditions up to the end of mining is not provided it reduces confidence in the post mining modelling presented.	**Provide a revised Appendix D inclusive of** – a) Predictive modelling from 2024 to the end of mining to support the post mining modelling and conclusions regarding hydrogeology of the site.
11	**Appendix D Hydrogeology Assessment, section 7.2**	**Landform Model**	**Provide a revised Appendix D inclusive of** –

		Section 7.2 states that, '*The PRC Plan's proposed final landform was replicated in the recovery model, including areas of spoil emplacement and the proposed residual voids. The distribution of modelled spoil emplacement is shown on Figure 1-3*'. However, there is no legend on Figure 1-3 denoting which are the areas of spoil. Understanding the areas of spoil is important in understanding how they will impact groundwater storage and movement, particularly adjacent the residual voids.	a) Revised Figure 1-3 providing a legend to denote the spoil areas.
12	**Appendix D Hydrogeology Assessment, section 7.2.4, 7.2.5**	**Mid-climate scenario** Section 7.2.4 and 7.2.5 discuss residual void groundwater inflow and predicted groundwater levels respectively in consideration of a mid-climate scenario. The sections do not discuss wet and dry climate scenarios, nor provide rational for choosing only mid-climate scenario for groundwater inflow and residual void water level predictions. Inclusion of wet and dry climate scenario is considered important as they are likely to influence the void lake levels and whether the voids are sources or sinks.	**Provide a revised Appendix D inclusive of** – a) Wet and dry climate scenarios to discuss prediction of residual void groundwater inflow and predicted groundwater levels.
13	**Appendix D Hydrogeology Assessment, section 6.1**	**Use of surrogate model for Roper project** The PRC plan in section 6.1.1.1 states that groundwater modelling for Lotus/Campbell, Gilbert and Price/Leichardt were appropriately aligned for the purpose of developing this PRCP. For Roper and East pit residual voids, modelling has been done based on a surrogate water balance model and as such shows greater variability	**Provide a revised Appendix D that includes -** a) Additional studies to identify relevant regional aquifers likely to be affected by each SSM residual void,

		between the model runs due to complexity of the groundwater connections between the residual voids. The additional data collection and further development of the models as part of the Roper project is scheduled to be completed prior to the commencement of mining of East Pit. Section 7.2.2 of Appendix D: Hydrogeology report states that, '*The assessment of the iterative model outputs between the groundwater model and the water balance model indicates the northern three SSM voids achieved an appropriate level of convergence for the purpose of this assessment. However, the alignment of the models for Roper and East Pit residual voids did not achieve the same level of convergence*'. Overall, the uncertainty due to lack of monitoring data and modelling studies for East pit and Roper area warrants robust mechanism to monitor residual void water levels for each void and the relevant regional aquifers water levels to understand their interaction to support proposed void behavior as sink.	b) Identification of locations for additional groundwater monitoring bores and target layers in the relevant regional aquifers, c) Additional improvement milestone criteria to install a residual void water level monitoring mechanism; and d) Criteria to compare regional aquifer water level data with the residual void water level data to confirm void behaviour as sink.
Groundwater Modelling			
14	**Appendix E Groundwater modelling technical report, Section 2.3**	**Model layers and thicknesses** In Table 2-1 of this report, the unit in model layer 2 is described as, 'Tertiary and minor Triassic Clematis Group, weathered Permian, Tertiary basalt.' The only time the Clematis is mentioned in either the Appendix D Hydrogeology assessment report or the Appendix E Groundwater model technical report is to describe layer 2 in the model.	**Provide a revised Appendix E inclusive of** – a) A review and description of model layer 2 from Table 2-1 and whether it should include the Clematis Group.

		The geology presented does not appear to indicate the Clematis is present.	
15	**Appendix E Groundwater modelling technical report, Section 2.4**	**Timing** Section 2.4 states that a steady state model was used to simulate water levels pre mining. A transient warm-up model with one 10-year stress period from January 1980 to January 1990 was then developed prior to the transient calibration model (January 1990 to October 2023). In particular, the report states that, '*the warm-up model provided appropriate starting conditions for the calibration model (i.e., starting heads and hydraulic properties)*'. It appears however that there is no groundwater level data available until 2004 (and no Permian groundwater level data prior to 2011). It is therefore not clear how the steady state and transient warm up model were calibrated. There should be some discussion of the process to provide confidence in the modelling.	**Provide a revised Appendix E inclusive of** – a) A discussion of the steady state and transient warm up calibration process, considering the lack of groundwater level data prior to 2004.
16	**Appendix E Groundwater modelling technical report, Section 2.7.2**	**Calibration Targets** Section 2.7.2 states that, '*the groundwater levels recorded between January 1990 to October 2023 were used as calibration targets*.' The above statement contradicts section 4.1 of the Appendix D Hydrogeological report which states that, '*the first groundwater monitoring bores were not established until 2004*' as such inference drawn is unavailability of groundwater level data prior to 2004.	**Provide a revised Appendix E inclusive of** – a) Clarify the timeframes in relation to the groundwater levels used as calibration targets.

17	**Appendix E Groundwater modelling technical report, Section 2.10**	**Calibrated Recharge** Section 2.10 (Table 2-12) indicates that the calibrated recharge for spoil was 0.4%. This appears low compared to rates referenced in literature and typically used in mining models but there is little discussion of whether there was sufficient target information to adequately constrain this parameter, particularly given it falls outside rates typically applied. The department requires further information on rising groundwater levels in spoil that may have occurred in the period following the start of care and maintenance in 2012 that provides support for this low calibrated recharge rate for spoil. It is noted that Appendix H Floodplain assessment indicates that most of the realisations run for the uncertainty analysis have a recharge rate in the spoil above 0.4% rch_5 (spoil). It is also noted that Figures 4-1 to 4-3 in Section 4.1 of Appendix E indicate that the base case predictions of groundwater inflow to Lotus/ Campbell, Gilbert and Price/ Leichardt voids is below the P50 predictions (uncertainty analysis) in all of these residual voids indicating that most of the realisations result in higher predictions of groundwater inflow than the base case. The calibrated recharge for spoil is considered an important part of the modelling process as it can have significant impacts on predicted groundwater inflow to the residual voids.	**Provide a revised Appendix E inclusive of** – a) A discussion and additional justification for the low calibrated recharge rate for spoil.
18	**Appendix E Groundwater modelling technical report, Section 3.1**	**Model Setup** Section 2.7 provides discussion about the groundwater modelling calibration period (ending in October 2023).	**Provide a revised Appendix E inclusive of** – a) Details in the body of the report of the predictive groundwater modelling from

		Section 3.0 provides discussion about the predictive groundwater modelling from end of mining (2098 as per PRC plan section 1.1.5) and beyond. Typically details of the predictive modelling that occurred from the end of the calibration period (October 2023) to the end of mining (2098) would be provided between these two other stages. Section 5.2 and 6.1 of the Appendix D Hydrogeological assessment report underline the importance of an understanding of the hydrogeological system response to mining, and conditions at the end of mining, in the context of defining the starting conditions for the post-mining assessment. It is assumed that predictive modelling of the groundwater system between the end of the calibration period and the end of mining has been carried out given the Recovery Model starting heads provided in Appendix E, but discussion in the body of the report appears to be missing and should be provided. The lack of such discussion and associated detail reduces confidence in the post mining modelling.	the end of calibration (October 2023) until the end of mining (2098).
19	**Appendix E Groundwater modelling technical report, Section 3.2**	**Integration with void water balance model** The information provided in the Appendix E: Groundwater model technical report and the Appendix M: Void closure plan report appear to indicate that the Lotus/ Campbell void has been modelled as one void. However, figures like Figure 3.1 in the Appendix M: Void closure plan report and Figure 3-20 in the Appendix E: Groundwater model	**Provide a revised Appendix E inclusive of** – a) Details of whether the Lotus/ Campbell void is predicted to have two separate lakes; and b) If the modelling in Appendix E has accounted for two separate lakes.

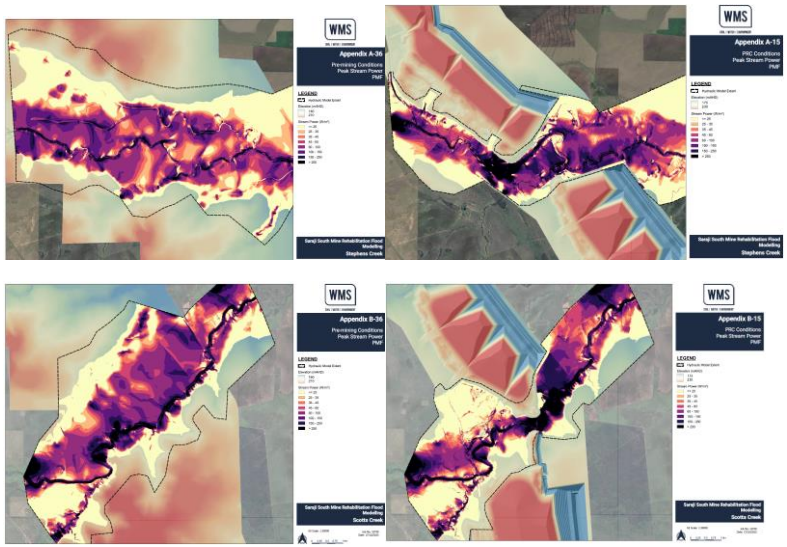
		technical report appear to indicate that there are two separate void lakes within the Lotus/ Campbell void. There appears to be no discussion of this issue in the reports and what impacts this has had on the modelling.	
20	**Appendix E Groundwater modelling technical report, Section 3.2**	**Roper Study Area** Section 3.2 states that, '*The PRC Plan's approach to the area containing the Roper residual voids includes the implementation of a 'Roper Study Area' and an additional remediation milestone (RM) that provides for additional studies to be completed to inform the further development of the closure landform. The additional data produced for the Roper Study Area will provide for further development of the groundwater and water balance models by providing additional data on groundwater and revised landform designs.'* There appears to be limited information in the reports as to what additional data on groundwater is proposed to be gathered and how that is likely to impact existing assessments.	**Provide a revised Appendix E and PRC plan inclusive of** – a) Additional information on the additional groundwater data to be gathered as part of the Roper Study Area and how this is likely to influence existing assessments.
21	**Appendix E Groundwater modelling technical report, Section 3.4**	**Residual Void Groundwater Inflow** Section 3.4 at page 46 states, *'As groundwater levels in the spoil and natural geology recover to elevations above some of the void lakes and lake levels stabilise, the direction of flow out of those void lakes stabilises and long-term groundwater inflow to the lakes is established after 24 years post-mining at Lotus/Campbell void, 6 years post-mining at Gilbert void, 1 year post-mining at Roper 4 void, 14 years post-mining at East 1 void, and 39 years post-mining at East 2 void for the mid climate scenario. Model results indicate that this inflow comes mostly via the spoil, originating mainly as local rainfall recharge applied to the spoil'.*	**Provide a revised Appendix E and PRC plan inclusive of** – a) Revised wording in Section 3.4 in regard to inflow of groundwater from the spoil to the residual voids.

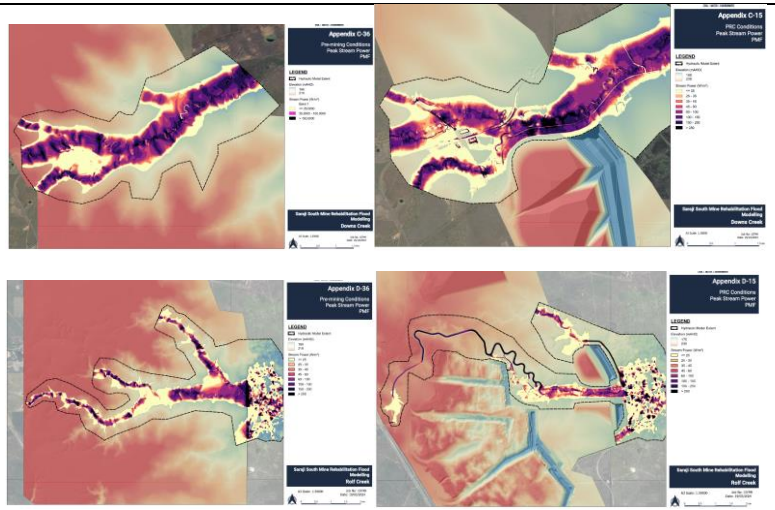
		However, this appears to contradict the latter part of Section 3.4 at page 56 which states, '*Model results indicate that, for most voids, more than 79% of the long-term groundwater inflow to the voids comes via the spoil, with between 2% and 29% of this inflow originating as local recharge applied to the spoil, and between 71% and 98% coming from natural geological formations before moving through the spoil into the residual void lakes*'. Therefore, the first statement appears to indicate that most of the inflow from the spoil originates as local rainfall recharge to the spoil and the second statement appears to indicate that only between 2 and 29% of the inflow from the spoil originates from local recharge applied to the spoil.	
22	**Appendix E Groundwater modelling technical report, Section 3.5.2**	**Groundwater level impacts to potential receptors** The section states that, '*A relatively significant amount of drawdown is predicted in the long-term post-mining. The maximum drawdown is expected to occur over hundreds of years, well beyond the expected service life of a groundwater bore, at the bore located in the Fort Cooper Coal Measure, RN38547 (~2 km east of the Gilbert void)'.* It is noted that the predictive hydrograph for RN38547 presented in Figure 3-43 demonstrates continuing drawdown from the end of mining onwards. Additionally, it is noted that any existing bore will potentially be replaced as the life of that bore comes to an end. It is not considered valid to dismiss impacts to a bore based on an assumption that it won't be operational at some time in the future.	**Provide a revised Appendix E and PRC plan inclusive of** – a) A more detailed consideration of potential impacts on RN38547 or any bore that might replace it in the future at that location.

23	**Appendix E Groundwater modelling technical report, Table 5-1**	**Groundwater Model and Data Limitations** Under the heading of Measurement Error, Temporal Spread, and in relation to water level data Table 5-1 states that, '*data is available from 1990, although most of the data covers the period 2010 – 2023*'. A review of the Appendix D: Hydrogeology assessment report indicates that there is no water level data available prior to 2004. Additionally in this table there is no discussion of the limitation that the lack of water level data during periods of mining places on the calibration process. In particular there is no water level data in the Permians prior to 2011 and the mine went into care and maintenance in 2012. The unavailability of water level data in the Permian is a significant issue and this becomes clear in many of the calibration hydrographs where the water level decline is simulated in response to pit depths but generally can't be verified by monitoring data. These limitations should be clear in order to understand the effectiveness of the modelling.	**Provide a revised Appendix E inclusive of** – a) A review of Table 5-1 in relation to period when water level data is available; and b) Discussion of the limitations that, a lack of water level data during peak mining periods places on the model calibration.
24	**Appendix E Groundwater modelling technical report, Appendix C – Calibration Hydrographs**	**Labelling of the layers** Groundwater modelling technical report Appendix B Calibration Residuals identifies 19 bores numbered from SSM_MB205 to SSM_MB225 that are used in the model calibration. However, a check of Appendix C shows no calibration hydrographs for these bores. Additionally, in Appendix C there is no indication as to which bores represent which model layer. To allow a review of how well the model	**Provide a revised Appendix E inclusive of** – a) Calibration hydrographs for the bores SSM_MB205 to SSM_MB225; and b) Updates to Appendix C to order the bores by model layer and label each bore to demonstrate which model layer they represent.

		has matched water levels in each layer, the bores should be ordered by layer and labelled to demonstrate which layer they represent.	
25	**PRC plan section 1.2.5.4 Groundwater use.**	**Groundwater Dependent Ecosystem (GDE)** The section states that there are ecosystems mapped as ground-water dependent in the GDE Atlas associated with watercourses traversing the site but concludes that there is limited potential for groundwater drawdown from mining activities. There is not enough information provided in the PRCP to determine whether GDEs should be considered, for example in species selection, risk assessment, and monitoring.	**Provide a revised PRC plan inclusive of –** a) Outcomes of the GDE desktop mapping referred to on p26 of the PRC plan; and b) An explanation of the implications of limited potential for groundwater drawdown, in the context of if the limited potential is considering entire site or specific to a watercourse.
26	**Appendix J Geochemical Characterisation of Mineral Waste**	**Back diffusion of salts** The void water quality is modelled (PHREEQC) to be hypersaline in some voids. Given the assumption that the void will act as a groundwater sink, it is unclear if there is any potential for back diffusion of salts into the surrounding "low salinity" groundwater.	**Provide a revised PRC plan inclusive of –** a) A discussion of any potential for hypersaline water in voids to impact surrounding groundwater quality.
Flood management			
27	**PRC Plan section 6.1.2 Flooding,** **The Appendix H Voids in floodplain assessment,** **Appendix I Rehabilitation flood modelling.**	**Flooding susceptibility and influence** PRCP guideline section 3.6.1 states that, '*if flooding is a consideration, develop a hydrologic model of the catchment and a hydraulic model of the proposed mining area. When assessing flooding, you must at least:* • *consider the location of domains in relation to potential flood levels* • *consider alteration of flow upstream and downstream*	**Provide a revised PRC plan to include** a) Comprehensive hydrologic and hydraulic modelling for the entire site, including all mining domains and all stream orders (waterways), b) Supplementary detail in Appendix H and I inclusive of site-wide flood susceptibility maps indicating 0.1% AEP and PMF flood levels and velocities,

		• *model flood levels (including probable maximum flood levels) for a range of design storm events* • *develop a flooding risk profile*'. For the above, the guideline does not restrict developing a hydrologic model to only stream order 4 or higher, and therefore the requirement applies to all stream orders catchment within the project site. The Appendix H Voids in floodplain assessment, is limited to floodplain modelling of major streams in consideration of NUMA's and does not extend to other stream orders or domains of the site. The Appendix A of the Appendix H is a memorandum on pre-lodgement between BHP/DES and the 'relevant watercourse' understanding is applicable to 'flood plain modelling' required under s3.4 of the PRCP guideline for voids in floodplain and not for assessing flooding susceptibility and influence across the site. Additionally, Appendix H does not provide maps showing 0.1%AEP and PMF flood levels and flood velocities. Appendix I Rehabilitation flood modelling is mainly limited to Roper pit area and other NUMAs within the floodplain but does not extend to other mining domains nor inclusive of stream order less than 4. As stated above the flood modelling reports Appendix I and H are targeted towards flood plain assessment for the NUMA area and do not provide adequate information with respect to what constitutes the floodplain for the overall site in consideration to all stream orders and how the flood waters potentially influence the other landforms.	c) Data showing interactions between floodwaters and various rehabilitated landforms across the site, d) Detail on how the full extent of the floodplain and potential flood influences were considered for each landform; and e) Measures to be adopted to confirm stability of all rehabilitated landforms under expected flood scenarios.

28	**Appendix I Rehabilitation flood modelling.**	**Floodplain & Creeks** The PRC plan indicates that compared to the pre-mining conditions of Stephen Creek, flow is concentrated in with much greater steam power and stream bed and bank erosion capability (mostly >80 W/m2). There are 4 ingress/interaction locations specified in Fig 5-1 (Appendix I). Overall, there is a significant concern about increased sediment transport capacity from mining activities in Stephen Creek. Similarly, Scotts Creek and Downs Creek, exhibit the same issue, with a substantial alteration in flooding patterns including expanded areas with significant stream power, which raises significant concerns regarding increased sediment transport capacity. Given these issues, the final landform condition is not stable. 	**Provide a revised Appendix I inclusive of –** a) A sediment management strategy addressing Stephen Creek to mitigate increased sediment transport and heightened stream power, especially due to headward erosion concerns in high-energy zones, b) Description and technical specifications of gradient control structures to stabilise channel slope and mitigate potential headward erosion, particularly where geomorphic instability is identified, c) Detailed type, material, and installation methods for gradient control structures to confirm their support of long-term stability, d) Design criteria values such as shear stress and stream power during peak flow events (PRCP Guideline, Section 6.1.8, p. 130); and e) Details of specific stabilisation features for bank and bed protection that focus on areas identified as vulnerable to geomorphic change, as per the Concept Design Report recommendations.

			
Creek Diversion			
29	**Appendix L Concept Design Report Rolf Creek East**	**Achieving Long-term Equilibrium and Stability** The report confirms that there is recognition of challenges posed by dispersive soils and geomorphic instability, which may prevent the diversion from achieving a self-sustaining equilibrium. Specifically, Section 2.3 of the report describes the diversion's current state, noting that: '*The diversion experiences ongoing geomorphic instability and suffers from poor riparian vegetation. Dispersive soils are contributing to sediment generation, which negatively affects sediment transport regimes, and hydraulic influences from Browns Dam also impact equilibrium (SSM PRCP App L Engeny)*'. According to Section 2.1 of the *Watercourse Diversion Guideline*, permanent watercourse diversions should maintain the hydraulic	**Provide a revised Appendix I inclusive of –** a) A description of any gradient control structures intended to stabilise the channel slope and control headward erosion, particularly where geomorphic instability has been identified, b) The type, material, and installation methods for gradient control structures to verify that they support long-term stability and compliance with guideline requirements for substrate resilience (watercourse-diversion guideline) on following aspects -

		stability of the diversion, including grade and bank stability, without reliance on frequent maintenance. The report does not provide mitigative measures to ensure the watercourse diversion on site will be stable post closure without reliance on frequent maintenance. The department must be confident that watercourse diversions will achieve ongoing stability which will be self-sustaining post surrender.	• Gradient control structures to stabilise the channel slope and mitigate potential headward erosion. • Design criteria utilised to maintain equilibrium in high-energy zones, including specific values for shear stress and stream power during peak flow events (PRCP Guideline, Section 6.1.8, p. 130); and • Specific stabilisation features for bank and bed protection, focusing on areas prone to geomorphic change, as highlighted in the Concept Design Report.
30	**Appendix L Concept Design Report Rolf Creek East**	**Hydraulic Stability design Criteria for High-Energy Zones** As per Outcome 3 in Section 1.4.1 (p. 12) of *Watercourse diversion guideline*, hydraulic characteristics of a permanent diversion should be comparable to local watercourses and adapted to the region. The guidelines recommend using calculations for shear stress, stream power, and velocity during key AEP flood events to verify the erosional stability. No information is provided to demonstrate how hydraulic forces are accommodated to achieve pre-mining conditions and mitigative measures where portions of the diversion will be vulnerable to peak flow conditions.	**Provide a revised Appendix I inclusive of –** a) Detailed hydraulic design parameters, and approach to demonstrate that hydraulic forces will become within tolerable limits or similar to pre-mining, preventing erosion risks; and b) Any adaptive strategies for high-energy zones where bank and bed stability may be vulnerable under peak flow conditions.
31	**Appendix L Concept Design Report Rolf Creek East**	**Floodplain Corridor Width and Natural Channel Evolution**	**Provide a revised Appendix I inclusive of –**

		Section 2.2 of the *Watercourse Diversion Guideline* emphasises the need to allow sufficient floodplain corridor width to facilitate natural channel evolution and self-sustaining stability without requiring maintenance. The existing design lacks specific details on the floodplain corridor width, vegetation selection, and roughness elements (such as boulders or native vegetation) intended to control flow energy, thereby reducing erosion and enhancing channel resilience.	a) A description of the floodplain corridor width adopted in the design and its role in supporting natural channel evolution, specifically: • Vegetation types and roughness elements (e.g., boulders, native vegetation) incorporated to manage flow energy and reduce erosion potential; and • Confirmation that the corridor width aligns with *Watercourse Diversion Guideline* requirements on ensuring self-sustaining stability without the need for ongoing maintenance, demonstrating how the design fosters resilience under natural hydrological conditions.
32	**Appendix L Concept Design Report Rolf Creek East,** **PRC plan section 6.1.2**	**Bank and Bed Protection Measures in Areas of Geomorphic Instability** Outcome 5 of the *Watercourse Diversion Guideline* (p. 12) states that permanent diversions must include stabilisation measures suited to substrate conditions, ensuring equilibrium and functionality without ongoing maintenance. Given the identified geomorphic instability, specific stabilisation methods are required for bank and bed areas to prevent erosion and maintain stability.	**Provide a revised Appendix I inclusive of –** a) Details on bank and bed protection techniques for areas prone to geomorphic instability, as noted in the Concept Design report, specifically on following: • Armouring materials, their placement, and design maps/life. • Material specifications, installation methods, and expected longevity of

			the armouring, tailored to withstand the hydraulic forces of a 0.1% AEP flood event, especially in areas with high erosion potential. • Strategies to prevent headward erosion, particularly in dispersive soils. • Targeted stabilisation measures such as grade control structures in erosion-prone sections. • Description of any artificial grade control structures included in the design to address slope instability and minimise bank erosion. Ensure that these structures are compatible with natural channel processes and will not impede the flow regime or sediment transport functions of the diversion (as emphasised in the Watercourse Diversion Guideline, p. 5).
33	**Appendix L Concept Design Report Rolf Creek East**	**Sediment Transport Regime and Erosion Control** According to Outcome 4 of the Watercourse Diversion Guideline (p. 4), maintaining a natural sediment transport regime is critical to a diversion's stability, particularly in areas affected by dispersive soils. The PRCP Concept Design Report currently lacks details on sediment transport analysis and/or modelling outcomes to confirm	**Provide a revised Appendix I inclusive of –** a) A sediment management strategy, covering following: • Sediment transport analysis and/or modelling outcomes to confirm the diversion's capability to handle

		the diversion's capability to handle sediment dynamics under varying flow conditions, without excess deposition or erosion. Furthermore, there is insufficient information on armouring strategies for high-erosion areas within creek beds and banks to stabilise sediment transport and control scour during peak flows.	sediment dynamics across low- and high-flow conditions without causing excess deposition or erosion. • Details on specific armouring strategies for creek beds and banks in high-erosion areas to stabilise sediment transport and control scour during peak flows. b) A long-term sediment monitoring plan with designated locations, monitoring frequency, and adaptive management protocols that align with expected sediment loads based on hydrological and hydraulic conditions (see PRCP Guideline, Section 8.1, p. 206).
Landform Design - **NUMA**			
34	**PRC plan section 4.2 NUMA Area**	**Minimise Environmental harm** PRC plan section 4.2 states that based on the technical analysis carried out for PRCP, the EA holder is proposing to partially backfill Lotus, Gilbert, Price and East pit on the end wall sides to mitigate the risk of flooding and also states that the landform has been redesigned to increase the distance of the void high-wall and end-wall from the approved extents to achieve 1.5 factor of safety (FoS). Specific details are required on the exact extent of partial backfill for each of the abovementioned void and increase in distance of the	**Provide a revised PRC plan that** – a) Specifies the associated Rehabilitation Area/s (RA), b) Specifies how much ramp area (including batters) is included in NUMAs and how this relates to minimising NUMA size, c) Clearly identifies the measurable extent of partial backfill for Lotus, Gilbert, Price and East pit for inclusion as Improvement area milestone criteria,

		void high-wall and end-wall so that measurable improvement area milestone criteria can be applied.	d) Includes a figure/s showing the extent of partial backfill for Lotus, Gilbert, Price and East pit, e) Clearly identifies total distance between the void high-wall and end-wall to achieve 1.5 FoS; and f) Includes figures showing the previous distance and figures showing the increased distance between the void high-wall and end-wall achieving 1.5 FoS.
35	**PRC plan section 4.3 NUMA Area**	**Minimisation of NUMA Area** The PRC plan in section 4.3 provides the final iteration of the closure landform submitted in the PRCP to demonstrate further minimisation of NUMA including, 'extending the PMLU on the low wall into the residual void, 20m below ground level for Lotus/Campbell, Gilbert and Price/Leichhardt pits'. Further details are requested regarding the PMLU on the low wall the understand the full extent of NUMA minimisation and ensure that all PMLU areas are captured in the Schedule accurately.	**Update the PRC plan to –** a) Specify how much of low-wall area (in hectares) associated to Lotus/Campbell, Gilbert and Price/Leichhardt pits is planned for rehabilitation, b) Provide figures to explain/show low-wall area subjected to rehabilitation to a PMLU, c) Specify assigned PMLU for the abovementioned low-wall area; and d) Specify associated Rehabilitation Area (RA).
36	**PRC plan Figure 16 PMLU and NUMA areas**	**Ramps** Figure 16 of the PRC Plan indicates that ramps will be included in the NUMAs, however it is unclear whether ramp batters will be	**Provide a revised PRC Plan inclusive of –**

		pushed down to achieve an erosionally stable gradient (as per Appendix K) and assigned a PMLU or left at the angle of repose and included in NUMAs. If ramp batters are intended to be left at the angle of repose and included in the NUMA, more information is required to demonstrate why it is acceptable for areas that are above the 20m below ground level threshold described in Section 4.3 to be included in the NUMA.	a) Further information to clarify whether ramp batters are included in NUMA's or assigned a PMLU, b) A detailed description and justification of the final landform characteristics and treatments proposed for ramp batters; and c) Figures to clearly illustrate the proposed final landform and PMLU arrangement.
37	**Appendix K Erosion and landform evolution simulations to support waste landform design**	**Erosion within NUMA** Section 4.3 of the PRCP proposes steepening low wall slopes (at or close to angle of repose). While the lowwalls are within the NUMA area and therefore do not have to meet rehabilitation area milestones, it is still necessary to demonstrate that they will not impact adjacent structures or rehabilitation areas. Erosion modelling in Appendix K considered inward facing slopes (lowwalls and ramp batters) with gradients up to 30% and assumed some vegetation cover. These assumptions are not reflected in the proposed landform design or captured in the PRCP schedule. Insufficient information has been provided to demonstrate that the proposed landforms are consistent with best practice management or how angle of repose lowwalls and ramp batters will remain sufficiently stable so that any gullies which form within the NUMA will not impact adjacent RA's.	**Provide a revised PRC Plan and schedule inclusive of** – a) Information demonstrating that the risk of erosion occurring within the NUMAs has been appropriately assessed and is being managed in a way that achieves best practise management of the area and minimises risks to the environment, b) Management milestone criteria that provide for implementation of effective erosion controls within NUMA; and c) An explanation of any deviation from the recommendations in the Erosion and Landform Evolution Simulations to Support Waste Landform Design (Appendix K), supported by scientific reasoning as to why a recommendation is not being followed, and re-model the final landform stability based on changes to the original model.

		Section 7.1.1.3 of Appendix M states that erosion of pit highwalls and end walls was not considered in the geotechnical assessment as it is an erosion and surface water management issue. However, Appendix K does not include any consideration or assessment of the risk of gully development on highwall or end wall crests. Given the highly erodible nature of the upper strata exposed in pit walls, there is a risk that gullies forming on these crests may cut back and impact critical structures (e.g. safety bunds or levees). This risk has not been quantified or managed.	
Landform design – Other domains			
38	**Appendix K Erosion and landform evolution simulations to support waste landform design**	**Slopes, vegetation groundcover and erosion modelling** WEPP simulations were undertaken using the materials: Clay soil (vertosol) and Permian sandstone waste. SIBERIA modelling also undertaken based on the WEPP output. Sections 3.4.4 and 3.4.6 outline assumptions and limitations of the modelling and these should be considered when interpreting the model output. “Vegetation groundcover” in the report specifically considers contact cover of vegetation on the soil surface. Practically, this means a combination of grass cover and anchored (not readily moved) surface litter. The PRC plan in section 6.1.5.3 states ‘vegetation cover includes plants, plant litter, tree leaf litter, twigs and woody debris that protect the soil surface from erosion’. This definition includes some proportion of non-fixed vegetation (readily moveable), which is a deviation from the recommended ‘vegetation cover’ by Appendix K.	**Provide an updated PRC Plan and schedule inclusive of** - a) Specification on: • coherent landform design • material handling/placement • surface treatment, b) vegetative groundcover criteria that are informed by and consistent with the assumptions, findings and recommendations of the erosion and landform modelling as per Appendix K; and c) Add revised definition of vegetation groundcover in PRCP schedule

		Any such deviation from expert report necessitates additional modelling to provide evidence of proposed deviations to achieve safe, stable landform. Section 8 concludes that 'both runoff/erosion simulations using the WEPP model and landform evolutions simulations using the SIBERIA model indicate that the proposed waste landforms at SSM can be expected to be stable over the long term (up to 300 years) provided the correct surface materials and the required levels of vegetation groundcover for those materials are achieved.' The landform evolution modelling assumed that clay soils will be used for rehabilitation works associated with outward-facing slopes, and Permian waste will be used for rehabilitation of low walls. The Appendix K outlines the results of the WEPP simulations as: **Outward-facing slopes (clay soil)** • 30% slopes would require 90% vegetation groundcover • 15% slopes would require 70% vegetation groundcover • 10% slopes would require 50% vegetation groundcover **Inward-facing low walls (Permian waste)** • 30% slopes would require 50% vegetation groundcover • 10%/15% slopes would require >30% vegetation groundcover From this information, the Siberia Model uses the parameters of vegetation groundcover level of 70% for outward-facing batter	consistent with Appendix K 'vegetation groundcover' interpretation.

		slopes (clay soil) and 50% vegetation groundcover on inward-facing batters (Permian sandstone) to meet target erosion rates. The proposed criteria through RM11,12,14 and 18 is 50% vegetation groundcover for slopes less than and greater than 15%, without specification about outward/inward facing slopes and material type that is clay soil/permian waste or slope specification. As such, the proposed vegetation groundcover criteria for RM11,12,14 and 18 does not align with the recommended vegetation groundcover parameters in Appendix K. According to Appendix K, outward-facing slopes should have 70%-90% vegetation groundcover on slopes greater than 15%. As such, the proposed criteria require revision to be consistent with the results of the landform modelling as per below example – For RA1 and RA12 (30% slopes): • outward facing with clay soil 90% vegetation cover. • Inward facing low walls with permian waste 50% vegetation cover. For RA4 and RA15 (15% slopes): • outward facing with clay soil 70% vegetation cover. • Inward facing with permian waste 50% vegetation cover. It is acknowledged that rock cover generally increases erosion resistance, however, as stated in Appendix K, the rockiness of the	

		material is already accounted for in the material properties. If rockier materials than those assessed in Appendix K are intended to be used, additional simulations are required to clearly identify cover levels required for stability.	
39	**PRC plan section 6.5**	**Infrastructure to be retained** Section 6.5 outlines potential infrastructure to be retained post closure. PRC plan section 1.2.12 shows portions of the project land where BMA is not the underlying tenure holder. It is not clear if any of the proposed infrastructure to be retained is on the privately owned land, as such further information required.	**Provide a revised PRC plan inclusive of –** a) Clarification on if any infrastructure proposed for retention post-closure is situated on privately owned land; and b) if so, outline any required permissions or consultations undertaken.
Material Characterisation			
40	**Appendix F Material Characterisation Study**	**Use of Permian material** The ranking of soil types within a soil management unit (SMU) based on pH, EC, ESP and grazing suitability class is presented below. The topsoils most suited to rehabilitation based on these limited parameters are the brown and black vertosols. This assessment is based on soil pH <8.6 and EC <0.3 dS/m (low salinity for a clay (60-80%) soil; Table 5.37 Hazelton and Murphy). Table 1. Ranking SMUs based on selected (limited) soil properties.	**Provide a revised PRC Plan addressing the following aspects:** a) Outline how screening of the Permian material for use as a subsoil (ISL) material will be carried out, b) Outline the SMART criteria that will address the management of Permian material (e.g. if dispersive, what ameliorants might be required and at what rates) and clearly define thresholds for suitability for use as growth media; and c) Expand Table 11 (Section 5.3) of the PRC Plan to include target criteria such as gypsum added to achieve ESP <6,

SMU	ASC	pH	EC (dS/m)	ESP (%)	Grazing Suitability Class
3	Brown vertosol	7.7	0.033	0.5	2
1	Brown vertosol	7.7	0.074	0.5	2.5
5	Black vertosol	8.3	0.223	6	2
2	Black vertosol	8.4	0.125	0.5	2
4	Black vertosol	8.5	0.253	6	2
6	Black vertosol	8.5	0.322	8	2
9	Grey vertosol / Dermosol	8.8	0.532	25	3
10	Grey vertosol	8.9	0.38	17	3
14	Black vertosol	9.1	0.287	11	3
11	Brown sodosol	9.2	0.392	30	4
8	Brown vertosol	9.2	0.57	31.4	4.5
7	Brown vertosol	9.5	0.543	32	4.5
13	Black or Brown vertosol	9.6	0.313	19	3
12	Brown sodosol	9.6	0.518	38	4
15	Brown chromosol				3

Appendix F characterised soil stockpiles in two broad groups: clay (vertosols) and sand and loam (sodosols) soils (Section 4). Both soil groups were near-neutral to alkaline, low salinity and may suffer nutrient deficiencies based on the vegetation species mix. Both groups had the potential to be dispersive and hence erosion prone. It is recommended that the vertosol is more suitable for rehabilitation but should only be used on low slopes such as plateau of WRD – not on batters. The report concluded the sand and loam group of soils are less suitable for rehabilitation and its physical and chemical properties will need to be managed. It is recommended this soil group not be used in rehabilitation.

Permian spoil has various inherent limitations in terms of chemical and physical properties. As recommended by Appendix F (Section 4.3.1) due to the heterogeneous nature of this material discrete

salinity (1:5) <0.7 dSm (based on clay percentage) etc.

		testing is required prior to its use in rehabilitation as a growth medium.	
Cover design			
41	**PRC plan section 6.2.1, 6.1.6**	**Conceptual cover design for TSF** The PRC plan in section 6.2.1 provides information on TSF facilities on site and the tailings characteristics. Section 6.2.2 states that sampling has been carried out across the footprint and vertical profile of Old Tailings Dam (OTD), except at Ramp 67 due to unavailability of safe access. The section further provides details on moisture content and density for four samples collected from OTD. The geochemical characterisation for both TSFs proposed to be carried out as part of Roper project area (s6.2.2.3 of the PRC plan). Further information is required as per s3.6.2 of PRCP guideline on following tailings geochemical aspects to support a cover design – • Particle size distribution analysis based on conditions in the TSF. Particle size distribution of tailings affects their hydraulic sorting down the tailings beach, and their settling, consolidation and desiccation on atmospheric exposure. • Specific gravity testing. The specific gravity of tailings affects their hydraulic sorting down the tailings beach, and their settling and consolidation. • Settling testing of the tailings used as an indicator of the settling density of the tailings. • Consolidation testing of the tailings to estimate their consolidated density and saturated hydraulic conductivity. Soil water characteristic curve testing to assess the unsaturated	**Provide a revised PRC plan, PRCP schedule and relevant appendix inclusive of** – a) An interim conservative cover design for TSF based on potential risks in absence of relevant technical data, b) A revised schedule reflective of earlier rehabilitation timeline if TSF material characterisation assumed to be similar to adjacent BMA mines, **and/or**; c) Information required as per s3.6.2 of PRCP guideline.

		behaviour of the tailings on desiccation and calculate the unsaturated hydraulic conductivity function. In interim the application has proposed a conceptual cover design which is a *non-ponding landform with at least 2m of spoil cover* (s 6.2 of PRC Plan). It is not clear, in absence of geochemical characterisation data, what inputs, risk factors have been considered to propose a conceptual cover design of 2m spoil cover which appears to be a bare minimum. No explanation provided why a conservative approach has not been adopted for proposing cover design, in absence of the required technical information. If the proposed conceptual design is based on consideration of TSF material being similar to EA holder's other mine site adjacent to SSM, then proposed delay in rehabilitation of the SSM TSF contradicts EA holder's adopted position of uncertainties with material characterisation resulting in delay.	
Soil and capping material			
42	**PRC plan section 6.1.4**	**Use of permian spoil as growth media** Appendix F, section 4.3.1 states that, '*out of two spoil groups Permian material and weathered tertiary material, Permian material considered most suitable for placement close to the final rehabilitated surface for use as secondary growth media*'. This section also proposes to use permian spoil as a primary and secondary growth media in rehabilitation, specifically for low-wall	**Provide a revised PRC plan inclusive of -** a) Clarification on proposed growth media (primary and secondary) for low wall, b) Supporting evidence to show success of permian spoil use as growth media and achievement of safe, stable, self-sustaining landform; and

		spoil areas which are planned to utilise ameliorated permian spoil as an alternative growth media with rock on the surface area. Evidence is required to demonstrate effective use of permian spoil in rehabilitation as primary growth media.	c) A revised schedule that includes growth media criteria to ensure all growth media (not just topsoil) are suitable and can support the required levels of vegetative groundcover in perpetuity.
43	**Appendix F Material Characterisation Study**	**Topsoil suitability target** Appendix F, section 4.3 provides information on the potential use of two spoil groups Permian material and weathered tertiary material in rehabilitation and concludes Permian material to be most suitable for use as secondary growth media. The Appendix F, section 5 clarifies the difference between primary and secondary growth media and states that, 'primary growth media consists of surface soil (topsoil) materials or growth medium developed from subsoils or spoil materials, ameliorated to standard suitable to support sustainable plant growth. Secondary growth media may include spoil material capped with primary growth medium, or an intermediate layer of ameliorated spoil placed on unameliorated spoil material and then capped with primary growth media. In some circumstances, secondary growth media may be able to be sufficiently improved by the addition of ameliorants such as gypsum, lime, organic matter to convert them to a primary growth medium. Further Table 11 of Appendix F provides recommended fertiliser and ameliorant treatments for materials and growth media suitability classification and needs to be expanded to define a suitability target considering each PMLU. Table 11 should include target criteria such as gypsum addition to achieve ESP <6, salinity (1:5) <0.7 dS/m (based on clay%) etc.	**Provide revised PRC plan and Appendix F inclusive of** – a) Growth media suitability targets for each PMLU for inclusion in PRCP schedule.

		Also, no topsoil suitability targets are defined in Appendix F: Material characterisation study, which are required for schedule criteria.	
Revegetation			
44	**Revegetation objective, PRC plan section 6.1.8.1.**	**Revegetation plan** The PRC plan in section 6.1.8.1 describes revegetation objectives for SSM, which includes establishing a hybrid ecosystem on spoil dumps representative of surrounding RE's or a target RE. Section 6.1.8.7 and Table 42 of PRC plan provides a recommended species list which does not target a particular RE in accordance with the objective and proposes a mix of species generally available surrounding the site. The application appears to propose a hybrid ecosystem and specifies an average benchmark (as in Table 68 of PRC plan). However, as proposed, there are too many disparate REs combined. Most of the species listed for the hybrid ecosystem are suitable for RE 11.5.3 and this is widely distributed in the area and would be a suitable target. Could consider RE 11.5.3 only, or an 11.5.3/11.5.2 hybrid if greater flexibility in species selection is wanted. Where a specific target RE (RA 4 & RA 15 surrounded by vegetation) is prescribed, these areas should be separated from those where a hybrid will be used. *Cynodon dactylon* (couch) is considered an environmental weed https://apps.des.qld.gov.au/species-search/details/?id=15486 and shouldn't be included in the species mixes. The above asked information is relevant to developing rehabilitation milestones criteria for RM – Achievement of surface requirement.	**Provide a revised PRC plan inclusive of –** a) Specific REs for specific areas or reduce the number/disparity of REs amalgamated in a hybrid; and b) Remove *Cynodon dactylon* (couch) from the species mixes.

45	**PRC plan section 8.2.5.5 Recruitment.**	**Recruitment criteria** The section proposes that recruitment of canopy species is assessed by observing the proportion of the species in the ecological dominant layer regenerating (<5cm diameter at breast height) at each monitoring site. This definition (<5cm dbh), although 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. Further explanation of this criteria is required with consideration to the practicality of distinguishing between recruits and sown vegetation.	**Provide a revised PRC plan inclusive of** – a) Alternative recruitment indicators, such as low height relative to others of the same species, occurrence of species not in the original seed mix, and/or evidence of flowering/fruiting, should be included.
46	**PRC plan section 6.1.8.1, RM11 rehabilitation criteria.**	**Revegetation objective** This section states that slopes greater than 15% are to have more than or equivalent to 80% groundcover. The RM11 criteria states that out of proposed 80% groundcover, vegetation cover is to be 50%, inferring to 30% rock material cover. A high percentage of rock cover could hinder vegetation establishment and growth and impede use by fauna. Further justification is required on the proposed rock proportion of ground cover, with consideration of any unintended risks to fauna.	**Provide a revised PRC plan inclusive of –** a) Justification that why such a high percentage rock cover is necessary to prevent erosion and; b) Explain how it will be distributed so as not to create barriers to fauna movement.
47	**PRC plan section 6.1.8.8 Watercourse revegetation.**	**Watercourse** The PRC plan in Figure 11 on p 37 shows that watercourses within SSM are noted as baseline fauna habitat for koala and greater glider.	**Provide a revised PRC plan that** – a) Specifies RE 11.3.25 as the target ecosystem for watercourses and provide

		Watercourses are important for landscape connectivity and movement of these and other species. Stephen's Creek is a state riparian corridor that connects through to a state terrestrial corridor, but a large section of Stephen's Creek diversion is bordered by a PMLU of grazing. Rolf Creek provides connectivity to Boondara State Forest but is also bordered by grazing PMLU in the western portion. The species mixes presented in Table 43 & 44 are largely acceptable for RE 11.3.25 (with couch being an exception as raised in Item 44) and a good level of species richness is provided. However, the milestone criteria presented (2+ trees, 2+ shrubs, 2+ grasses (exotic and native), canopy cover 13%+ are too low and will not result in a self-sustaining, resilient native ecosystem. It is noted that the Roper Project Area requires further study. Rehabilitating this area to woodland would reconnect remnant vegetation east and west of the mining activity and connect south to the corridor that includes Boondara State Forest. .	BioCondition-based criteria for its achievement, b) Specifies the width of the RA2 riparian corridors and ensure these are adequate to provide connectivity along watercourses and buffering from adjacent grazing where this is planned; and c) For the Roper Project Area, details how native ecosystem connectivity can be rehabilitated.
48	**PRC plan section 6.1.8.8, section 6.1.8.9**	**Watercourse Revegetation** The *Watercourse Diversion Guideline* requires that chosen vegetation enhances stability and mimics natural ecosystems (Revegetation and Vegetation Management, p. 4). However, the current revegetation approach proposed in the PRC plan section 6.1.8.8 and Table 43, 44 does not sufficiently detail how	**Provide a revised PRC plan inclusive of –** a) A detailed revegetation plan clarifying the following: ○ Relevance and suitability of proposed plant species for high erosion control, bank stability, and hydraulic compatibility.

		proposed plant species are effective for erosion control, hydraulic compatibility, or bank stability.	○ Site preparation and erosion control techniques tailored to improve root establishment, particularly in areas prone to erosion. Include data on the efficacy of these species in mitigating erosion in similar hydrological settings. ○ Long-term monitoring and adaptive management plans for vegetation to confirm ongoing health and stability.
Risk Assessment			
49	**PRC plan, Appendix N: Risk assessment Matrix.**	**Risk Identification** The PRCP guideline in section 3.7 states that, '*identification of risks should include risks whether or not they are in the applicants' ability to control (e.g. weather events), as the potential impact of these risks on the completion of milestones may still need to be considered when choosing appropriate completion dates for the PRCP schedule. The potential consequences, cascade and cumulative effects should be examined. The objective of this step is to create a comprehensive list of risks based on events, which may impede, enhance, delay or accelerate the rehabilitation of land to a stable condition or the potential for environmental harm and inability of a NUMA being safe and structurally stable'*. The Appendix N: Risk assessment matrix, identification of risks needs to be differentiated into risks which can be within EA holder's ability to control, and which are beyond such as – • Climate change impacts,	**Provide a revised PRC plan inclusive of –** a) Clarification how the risks which are beyond EA holder's control likely to impact the rehabilitation and final landform; and b) Mitigative measures for identified impacts.

		• PMF floods, • Delay in technical studies for Roper project; and • Roper project technical studies outcomes resulting in change in NUMA size, area or PMLU for the area. Further clarification needed to show how the risks which are beyond EA holder's control likely to impact the rehabilitation and final landform and mitigative measures for the same.	
50	**Appendix N: Risk assessment matrix**	**Risk of NUMA against uncontrolled flooding into voids** The mitigative measures for the above risk identified as '*flood mitigation designed to correct flood event*'. It is not clear how a 'correct flood event' scenario will be determined by the EA holder to design mitigative measures. The conservative approach is to design the mitigative measure to Probable Maximum Flood (PMF) level. Confirm basis to determine 'correct flood event' or confirm that flood mitigative structures for voids will be designed and constructed to mitigate PMF level.	**Provide a revised PRC plan inclusive of –** a) Clarification of the factors to be considered to determine 'correct flood event', or b) Confirmation that flood mitigative structures for voids will be designed and constructed to mitigate PMF level.
51	**Appendix N: Risk assessment matrix**	**Risk assessment of tenure land with no surface rights** There are two parcels of land over which BMA does not have surface rights although they are within the project tenures. A PMLU has been assigned to them as it is a requirement under the EP Act s126D(1)(a)(i). No rehabilitation area (RA) or rehabilitation milestone (RM) has been assigned for these parcels of land, likely due to nil surface rights.	**Provide a revised PRC plan inclusive of –** a) Risk assessment of areas with no surface rights if fails to achieve a designated PMLU its impact on the adjacent RA's.

		The risk assessment at present does not consider the risk of these areas failing to achieve the PMLU.	
Rehabilitation trials			
52	**PRC plan section 7.2**	**Permian spoil use as growth media** There are no rehabilitation trials proposed at SSM. The Appendix K: Simulations to support waste landform design provides an indication of vegetation cover to meet target erosion rates but does not determine the exact vegetation cover required. The PRC plan in section 6.1.4.2 further states that for the woodland habitat PMLU, an alternative growth media may be used prepared by ameliorating suitable permian spoil. There is no information provided to demonstrate reliability of proposed rehabilitation approach of use of permian spoil as a primary growth media in absence of topsoil coupled with low vegetation in achieving long term rehabilitation success. Confirm if above rehabilitation approach of use of permian spoil as primary growth media has been adopted at SSM for any existing rehabilitation. If no, provide basis/evidence to demonstrate success of the proposed novel approach. ***Note:** • 'Primary Growth Media' defined as the ability of materials to be used as a topsoil or topsoil surrogate. • 'Secondary Growth Media defined as the ability of materials to be used as substrate or substrate surrogate.	**Provide a revised PRC plan inclusive of –** a) Area details (area in hectares, and break up per domain) that is proposed to use permian spoil as primary growth media; and b) Details of existing rehabilitation on site that demonstrate successful use of permian spoil as primary growth media for rehabilitation and able to support growth of vegetation long term.

Monitoring and maintenance program			
53	**PRC plan section 8.1.2, Table 64.**	**Erosion Classification** The PRC plan Table 64 shows the erosion classification proposed by the EA holder based on the CSIRO publication. The proposed classification does not quantitively define the amount of the rill/gully erosion in a way that is comparable to the CSIRO publication. Also, the proposed classification does not have criteria for tunnel erosion and mass movement. PRC plan section 8.1.2 states that an AQP will assess all minor, moderate and tunnel erosions and it will be remediated if assessed as requiring intervention. This suggests that an AQP will have discretion to determine – • Method of monitoring, assessing different classified erosions; and • If remediation is required to achieve the PMLU. Clarify how the proposed approach for erosion monitoring meets the PRCP guideline section 3.8 requirement.	**Provide a revised PRC plan inclusive of –** a) A quantitative erosion classification for rill and gully erosion that aligns with the CSIRO publication and includes criteria for tunnel erosion and mass movement, b) A clear methodology for monitoring and assessing different types of erosion as well as the criteria for determining when remediation is required, c) Confirmation that the proposed approach complies with the PRCP guideline requirements for erosion monitoring and remediation; and d) Revised milestone criteria reflecting the above items.
54	**PRC plan section 8 Monitoring and Maintenance,** **Section 8.3 Watercourse Monitoring**	**Monitoring schedule and criteria for watercourse** Effective monitoring is essential to identify and address stability or sediment transport issues promptly. The PRCP report should detail the monitoring strategy, with specific metrics, locations, and frequency outlined (PRCP Guideline, Section 8, p. 206). Section 8.3 states that Watercourse monitoring will be undertaken in accordance with the IDC methodology which is outlined in the *Monitoring and Evaluation Program for Bowen Basin River Diversions* (ID&A, 2001).	**Provide a revised PRC plan inclusive of –** a) A revised monitoring and maintenance plan covering: o Regular performance metrics for hydraulic stability, sediment balance, and vegetation health, with specific thresholds for action. o Monitoring during high-flow events to assess bank and bed stability

		PRC plan Table 69 outlines the monitoring parameters and schedule but does not clarify the performance matrix/completion criteria/targets against each parameter. The Table 69 and section 8.3 generally lacks information on monitoring points, mitigative strategies based on adverse monitoring outcome and monitoring parameters such as sediment balance.	(Watercourse Diversion Guideline, "Monitoring and Maintenance," p. 6). ○ Designated monitoring points along the diversion, particularly in high-risk erosion areas, to ensure early detection of geomorphic changes; and b) Maintenance plan and response actions if monitoring reveals excessive erosion, sedimentation, or bank instability.
55	**PRC plan section 8.2.4.1**	**Groundcover and Invasive plants:** Section 8.2.4.1 of the PRC Plan does not define a groundcover monitoring methodology. Section 8.2.4.2 states that Leucaena is acceptable for a grazing PMLU with existing transitional EA milestone criteria applied for planned cattle grazing. However, the PRCP schedule for the Roper area includes milestone criteria to manage Leucaena. Clarity is needed on whether the EA holder intends to maintain a specific quantity of Leucaena within the cattle grazing PMLU or aims to eradicate it due to its invasive nature.	**Provide a revised PRC plan that** – a) Clarifies on the management approach for Leucaena within the cattle grazing PMLU as stated in PRC Plan section 8.2.4.2, b) Indicates whether a target quantity of Leucaena is to be maintained or if eradication is intended due to its invasive characteristics; and c) Provides a groundcover monitoring methodology to ensure compliance with grazing and invasive species management criteria.
PRCP Schedule			
56	**Rehabilitation Area, PRCP Guideline section 4.1, step 2.**	**Roper project Rehabilitation Area (RA)** PRCP guideline, section 4.1, step 2 states that *the purpose of breaking down the site into rehabilitation and improvement areas is*	**Provide a revised PRCP schedule inclusive of –** a) Review RA12-18 (Roper project area) to identify parcels of land which could be

		to allow for <u>progressive rehabilitation</u> and closure of the site over the life of mine. SSM EA EPML00865013 defines Progressive Rehabilitation as following - Progressive means, rehabilitation undertaken at a staged approach to rehabilitation as mining operations are ongoing; and Rehabilitation means the process of reshaping and revegetating land to restore it to a stable landform in accordance with criteria set out in the EA and where relevant includes remediation of contaminated land. It is noted that the proposed PRCP schedule breaks down the Roper project area in rehabilitation areas (RA12-18), but the assigned rehabilitation milestones (RM0.1 to RM0.4) for initial 10 years are more relevant/qualify as an investigation, monitoring and maintenance regime than progressive rehabilitation as defined in the SSM EA. As such, the Roper project area, although meets the definition of 'area available for rehabilitation' will not be subjected to actual rehabilitation work; but will be undergoing further investigations to facilitate future rehabilitation work. Thus, the proposed break down of the Roper project area does not achieve the purpose of progressive rehabilitation as stipulated in the PRCP guideline.	subjected to progressive rehabilitation work that is reshaping and revegetating land to restore it to a stable landform or remediation of contaminated land work, b) Ensure that the PRCP schedule for the Roper project area includes milestones that reflect active rehabilitation consistent with PRCP guideline section 4.1, step 2; and c) Review and revise timeline in 'date area is available' and 'Milestone completed by' for RA12-18 to promote progressive rehabilitation throughout the 10-year period associated with proposed RM0.1 to RM0.4.
57		**All RA**	**Provide a revised PRCP schedule -**

		It appears that all RA's are not numbered in chronological order, after RA4, there are no RA5 and 6, but directly RA7 is proposed. It is not clear if this is just a typo mistake or there is a rational for using such numbering.	a) Review RA numbering to reflect correct RA numbering.
58		**RA19 Progressively certified rehabilitation** Section 5.7 of the PRCP guideline states that an area that has been certified must be maintained under the requirements of the EA and PRCP schedule until the EA is surrendered. RA19 shows total 294ha of progressively certified area with a PMLU of Cattle grazing. No RM has been applied to the area, but considering the PRCP guideline as the area needs to be maintained up until surrender, it is recommended that RM13 Achievement of post-mining land use to a stable condition (Cattle grazing) to is applied to ensure maintenance of RA19 to stable condition.	**Provide a revised PRCP schedule inclusive of –** a) Application of RM13 Achievement of post-mining land use to a stable condition to RA19 to ensure maintenance of RA19 to stable condition.
59	**Rehabilitation Milestone Criteria, PRCP Guideline s4.1, step 5**	**Rehabilitation milestone criteria** PRCP guideline s4.1, step 5 states that *milestone criteria are used to demonstrate completion of progressive rehabilitation and improvement steps and events*. SSM EA defines Progressive Rehabilitation as following - • Progressive means, rehabilitation undertaken at a staged approach to rehabilitation as mining operations are ongoing; and • Rehabilitation means the process of reshaping and revegetating land to restore it to a stable landform in accordance with criteria	**Provide a revised PRCP schedule inclusive of –** a) PRCP condition/s to reflect completion of Roper project data collection, modelling, design and plans work within a defined reasonable timeframe; and b) Active rehabilitation criteria for RA12-18 that align with step 5 of the PRCP guideline, ensuring each milestone reflects tangible rehabilitation progress for available areas.

		set out in the EA and where relevant includes remediation of contaminated land. The proposed RM0.2-RM0.4 criteria mainly consist of monitoring and modelling does not actually reflect 'progressive rehabilitation' of the available area for rehab. As such the proposed RM0.2 to RM0.4 rehabilitation criteria are unlikely to meet the PRCP guideline and SSM EA requirement. An alternative option may be converting the criteria of RM0.2 to RM0.4 into PRCP condition.	
60	**Propose timing for when each milestone will be completed, PRCP guideline s4.1, Step 7**	**Timing of each milestone completion** PRCP guideline s4.1, step 7 states that the EP Act requires that the PRCP schedule must provide for each rehabilitation milestone to be achieved as soon as practicable after the land becomes available for rehabilitation. Considerations for determining when rehabilitation or improvement can be achieved 'as soon as practicable' include but are not limited to: • the size of the area to be rehabilitated or improved • the complexity of the rehabilitation or improvement methods • the suitability of weather seasonality for the rehabilitation or improvement. The PRCP guideline further states that, *availability of resources, equipment, undesirable weather are not considered factor for denying when land must be rehabilitated. Such aspects need to be*	**Provide a revised PRCP schedule inclusive of –** a) Earlier commencement dates for RM1 to RM18 associated to Roper project RA's considering area being available and proposed rational for delay does not sit within the considerations for 'as soon as practicable'.

		considered in the risk assessment in the rehabilitation planning part of the PRC plan and incorporated into the development of the proposed rehabilitation milestone completion dates. As raised in Item 59 above, the RM0.2-0.4 criteria unlikely to meet the PRCP guideline requirement, as such recommended to be incorporated as a separate PRCP condition. Considering the above recommendation, explore and provide options to bring back commencement dates for Roper project rehabilitation areas assigned to RM3 to final RM.	
61	**RA1 – rehabilitation timing**	**Extent of Rehabilitation** Only 1518ha of the total 3824ha (approximately 39%) of this rehabilitation area will be established by the completion of mining activities (2098). The department requires that a minimum of 80% of rehabilitation is completed by the cessation of mining activities in order that the most cost-effective best practice rehabilitation is achieved.	**Provide a revised PRCP schedule to** – a) Provide an accelerated rate of rehabilitation of RA1 that demonstrates the completion of progressive rehabilitation in line with the departments expectations.
62	**RM0.1 Project ground works**	**Timeframe allocation for Leucaena management** The proposed milestone criteria include activities of investigation and development of plan for large scale leucaena and establishing safe access to landforms for data collection. This RM has been applied to RA12-RA18 and proposed timeframe for completion of proposed activity under RM0.1 is two years from end of 2024 to 2026. As stated above the proposed RM criteria does not satisfy the 'progressive rehabilitation' activity definition as per EA, also the proposed timeframe of 2 years is not appropriately justified by	**Provide a revised PRCP schedule to** – a) Specify list of activities to occur in leucaena management; and b) Review the timeframe associated to completion of RM considering breaking up RA area into smaller areas to ensure leucaena management activities progressively applied to areas.

		providing sufficient evidence of actual extent of Roper area affected by leucaena, and a target approach to cover the area progressively for management. For example, RA12 is a spoil dump area of 658ha which could be broken down into smaller areas to ensure total area subjected to different activities of leucaena management. The criteria also do not describe activities involved in leucaena management, which again limits ability to proposed reasonable timeframes for RM completion.	
63	**RM3 landform development and reshaping**	**Placement of saline material** Appendix F includes a recommendation (in Table 11) that saline material should be buried to a depth greater than 2m below the final surface. The proposed RM3 criteria do not reflect this recommendation. It is important that materials that may negatively impact plant growth or runoff water quality are appropriately encapsulated.	**Provide a revised PRCP schedule inclusive of –** a) Appropriate milestone criteria to ensure that saline spoil materials are buried at least 2m below the final landform surface in accordance with the recommendations of Appendix F.
64	**RM5 Surface preparation (Woodland habitat)**	**Topsoil/Growth media application** The PRC plan in section 6.1.4.2 states that an alternative (assumably primary) growth media may be used on some woodland habitat areas where it is assessed by AQP to be suitable to achieve the PMLU. Table 36 provides quantity of growth media volumes required by SSM for PMLU's which shows woodland habitat to have 0.10m (100mm) growth media depth. The RM5 criteria states that, '*topsoil placed at minimum depth of 100mm or alternative growth media at minimum depth of 300mm*'. When the above criteria is read in conjunction with the PRC plan	**Provide PRCP schedule with revised criteria –** a) Specify ratio of topsoil to secondary growth media application for RA's with woodland habitat PMLU.

		Table 36, it is not clear if the proposal of alternative growth media of 300mm depth includes topsoil as primary growth media. If only alternative growth media application is proposed, sufficient evidence and appropriate milestone criteria are required to support – • Successful use of secondary growth media such as permian spoil for raising a stable, self-sustaining vegetation in absence of topsoil and; • To ensure unsuitable materials are not used as growth media.	
65	**RM10, RM11, RM12 Achievement of Surface Requirements, RM13, RM14, RM15, RM17, RM18 Achievement of post-mining land use to a stable condition**	**Gully erosion criteria** Milestone criteria relating to gully erosion include an item requiring demonstration of stabilised condition over a number of years. The amount of time required by the proposed criteria appears too low to demonstrate a stable condition. For example, for RA1, the schedule allows 10 years for rehabilitated areas to progress from RM8 (Revegetation) to RM11 (Achieves surface requirements), and another 10 years to progress from RM11 to RM14 (Achievement of post-mining land use to a stable condition), however milestone criterion RM11.5 e requires only two years of monitoring data demonstrating that any gullies present are in a stabilised state, and criterion RM14.3 e requires only 5 years of monitoring data demonstrating that gullies are in a stabilised state. For the achievement of surface requirements milestone or all RA's (not just RA1), the very short length of monitoring data demonstrating that gullies are stable appear inadequate and must be properly justified or extended, as active gully erosion up to eight	**Provide a revised PRCP schedule that includes –** a) Sensible periods of monitoring demonstrating continuity of the stabilised state once achieved for all RA's, for all achievement of surface requirements and achievement of PMLU to stable condition milestones.

		years after revegetation was completed can be expected to indicate a significant design or management issue. For the achievement of PMLU to stable condition milestones for all RA's should be the period of time since achievement of the previous milestone (e.g. 10 years for the RA1 example) plus the period required to demonstrate stability in order to achieve the previous milestone.	
66	**RM10, RM11, RM12 Achievement of Surface Requirements, RM13, RM14, RM15, RM17, RM18 Achievement of post-mining land use to a stable condition**	**Erosion criteria** The proposed erosion criteria allow for the presence of tunnel erosion. It is the department's position that the presence of tunnel erosion in post-mining land use (PMLU) landforms poses an unacceptable safety hazard and is not compatible with a stable condition. Milestone criteria must demonstrate that rehabilitated areas are stable and can be expected to remain stable and support the proposed PMLU.	**Provide a revised PRCP that includes –** a) Milestone criteria that adequately demonstrate that erosion has been minimised to a degree that it will not pose a risk to the ability of rehabilitated areas to achieve and sustain a stable PMLU.
67	**MM1 Achievement of structural stability** IA1.1	**Void backfill criteria** The schedule criteria specify residual voids that will be partially backfilled to mitigate flooding risk. The criteria further require specifying the approximate depth for backfill, such as above the regional groundwater table etc. to meet the 'measurable' attribute of SMART criteria.	**Provide a revised PRCP schedule** – a) Specifying the extent of partial backfill for Lotus, Gilbert, Price and Rolf creek voids.
68	**MM1 Achievement of structural stability** IA1.6	**Set back distance** The PRC plan in section 4.3 provides final iteration of closure landform submitted in the PRCP to include further minimisation of NUMA including, '*increasing the set-back of the high-wall and end-*	**Provide a revised PRCP schedule** – a) Clarifying minimum set back distance from mining lease boundary and watercourse.

		wall from the lease boundary and watercourse to achieve the required Factor of Safety (FOS)'. IA1.6 criteria specify a 50m minimum distance from external perimeter of mining lease for NUMA area (including safety bund) but does not specify minimum set back distance from watercourse for NUMA area.	