To:	Juliana McCosker	**From:**	Marianne Gibbons
Company:	Department of the Environment, Tourism, Science and Innovation		Peabody Energy Pty Ltd
		Date:	23 January 2026

RE: Information Request response for application A-EA-AMD-100973471

Dear Juliana,

Centurion Coal Mining Pty Ltd (a subsidiary of Peabody Energy Australia PCI PTY LTD) is seeking authorisation to undertake exploration activities and early works to support future longwall coal extraction within mining lease (ML) ML 1790. To obtain authorisation for these activities, an amendment to the Environmental Authority (EA) P-EA-100658735 and Progressive Rehabilitation and Closure Plan (PRCP) P-PRCP-100669070_V3 is required.

An EA Amendment Application Supporting Document for the proposed activities was submitted to the Queensland Department of Environment, Tourism, Science and Innovation (DETSI) on 3 November 2025. Subsequently, the following actions have been executed:

- An Assessment Level Decision was received from DETSI on 17 November 2025 stating that the proposed amendment to the EA and PRCP is a major amendment.
- An Information Request (IR) was received from DETSI on 19 December 2025.
- Meetings were held between DETSI and Peabody to discuss the IR on 8 and 19 January 2026.
- Public notification for the major amendment is scheduled to commence on 31 January 2026.

To address the IR and guide DETSI's review, the below table has been prepared which provides a response to each IR item raised and where responses can be found in the application materials. The EA Amendment Application Supporting Document, including relevant appendices, has been revised and updated accordingly.

If you have any further clarifications, please do not hesitate to contact us.

Regards,

Marianne Gibbons
Senior Manager – Approvals
Peabody Energy

<table>
<tr><th>Item #</th><th>Information Sought</th><th>Requested Actions</th><th>Response</th><th>Corresponding Section</th></tr>
<tr><td>1</td><td><u>Table 4-2 EA P-EA-100658735 Condition A15</u>
This amendment seeks to amend EA condition A15 including updates to Figures 1, 3 and 4 referenced in the condition and the addition of a new Figure 5.
It is recommended that the updated EA figures 1, 3, and 4, along with the additional figure 5 be provided separately, preferably in a high-resolution image format as they are required for inclusion in the final EA.</td><td>1.1 Provide the figures relevant to EA condition A15 separately, preferably in a high-resolution image format (JPEG, TIF, etc.).</td><td>High-resolution images (.jpg) and PDF have been provided for the proposed figures for the updated EA.
As noted in the EA Amendment Application, the following figure updates are proposed:
Replace Figure 1 with Figure 3-2;
Replace Figure 3 with Figure 6-15 (noting Figure 6-12 was indicated in the EA Amendment Application, however Figure 6-15 is a more appropriate figure);
Replace Figure 4 with Figure 6-16; and
Create a new Figure 5 using Figure 3-5.
For completeness, Figure 3-1 has also been provided to replace Figure 2.
It is noted that Figure 6-15 is the appropriate figure to replace the EA Figure 3. This change has been noted in Section 4.1.3 of the EA Amendment document.</td><td>Attached images and PDF documents
EA Amendment Document: Section 4.1.3</td></tr>
<tr><td>2</td><td><u>Table 4-2 EA P-EA-100658735 Condition A15</u>
This amendment seeks to update the EA Table 1 (Mining Activities) to include a maximum disturbance area to 234 ha for exploration activities and ancillary infrastructure, as outlined in the amended EA Table 1 (Mining Activities) provided below.
The supporting report in Table 3-1: ‘Drill Pad, Ancillary Infrastructure, and Access Track Disturbance Area’ indicates a total new disturbance of 167.41 ha. The current EA includes only a maximum disturbance of 13.2 ha for exploration activities and does not specify the extent of the area associated with historic drill holes and pads (310 drill holes).
Therefore, it is unclear how the proposed 234 ha in the provided EA Table 1 has been calculated.
<table>
<tr><th>Mine Domain</th><th>Mine Feature Domain</th><th>Location (GDA94)</th><th>Maximum Disturbance Area</th></tr>
<tr><td>Exploration activities</td><td>Drill holes and pads
Vertical and lateral wells
Historical holes and pads</td><td>As per Figure 1</td><td>Total disturbance area must not exceed 234 ha</td></tr>
<tr><td>Ancillary infrastructure</td><td>Roads and tracks
Bleeder shaft
Laydown area
Goaf Drainage Lines</td><td>As per Figure 1</td><td></td></tr>
<tr><td>Underground activities</td><td>Gate roads</td><td>As per Figure 5</td><td></td></tr>
</table>
</td><td>2.1 Provide clarification as to how the 234 ha has been accounted for in exploration activities and ancillary infrastructure.</td><td>A total of 234 ha of disturbance has been calculated from the sum of historical works, approved amendment works and the proposed amendment works. The breakdown of the maximum disturbance area is provided below:
Historical works: 78 ha:
Drill holes and pads: 35 ha;
Access tracks: 43 ha;
Approved amendment works: 13.51 ha (as per the submitted amendment documentation):
Drill holes and pads: 1.4 ha;
Vertical and lateral wells: 11.8 ha;
Access tracks: 0.31 ha;
Proposed amendment works: 167 ha (breakdown provided in Table 3-1 of the EA Amendment Application).
It is noted that this total is approximately 258 ha. However, when accounting for overlapping areas of disturbance, this amount is reduced to 234 ha. This reduction was noted in the proposed amendment application (Table 3-1).
Due to the number of layers and complexity of the site, exact breakdown of disturbance areas accounting for overlapping areas is not practical. It is noted that spatial information to the EA Amendment was provided as part of the PRCP spatial data submission.
A description of the breakdown of the maximum disturbance area as per the current EA has been provided in Section 3.2 of the EA Amendment Application document.</td><td>Supporting Document: Section 3.2</td></tr>
<tr><td></td><td></td><td>2.2 If required, provide a revised EA table 1 that includes a detailed breakdown of the proposed maximum disturbance of 234 ha for the associated exploration activities (including historical drill holes) and ancillary infrastructure.</td><td>In light of the discussion above, no changes are required to the EA Amendment application.</td><td>Not applicable (N/A)</td></tr>
</table>

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3	<u>Section 8 – Significant residual impact assessments</u> The koala is listed as endangered under both the NC Act and the EPBC Act. The significant residual impact assessment provided in Section 8 indicates that the Project has the potential to result in a significant residual impact on the koala, affecting an area of 64.83 ha. The EA holder has identified the offset requirements under the Queensland Environmental Offset Framework to compensate for the significant residual impacts. However, the supporting application materials do not provide detailed information on the measures proposed to first avoid and mitigate these impacts, nor do they specify the type of intended offsets, whether land-based or financial.	3.1 Provide evidence of how Peabody has adhered to the hierarchy of impact management, prioritising avoidance and mitigation measures before considering offset requirement.	Peabody has applied the hierarchy of impact management throughout the Project timeline and from inception. Further discussion of the avoidance and minimisation measures that have been implemented for the Project has been included and encompasses use of existing infrastructure, prioritizing underground versus surface infrastructure and consolidating surface footprints through design iterations.	Appendix C – Terrestrial Ecology Technical Report: Executive summary, Section 6.2, Section 7.2, Section 8.3.2.5 EA Amendment document: Section 6.4.5.1, Section 6.4.5.2
		3.2 Provide additional information on the offset proposal, specifying whether it will involve land-based or financial offsets, along with a justification for the chosen preference.	The preferred offset approach is via financial offsets due to the relatively small impact area to regulated vegetation (of concern RE) and koala habitat and concerns about the practicality and value of a similarly small land-based offset in a landscape where koalas are likely to require larger more viable habitat areas.	Appendix C – Terrestrial Ecology Technical Report: Section 9 EA Amendment document: Executive summary, Section 6.4.6, Section 7.0
4	<u>Regional ecosystem mapping – Certified map amendment (MAR3577B) and E2M ground-truthed mapping</u> Section 3.2.2.1 – Regional ecosystems states: *"An RE map amendment was submitted by Kleinfelder and approved by the Queensland Herbarium (MAR3577) in June 2024 to refine vegetation mapping within the Study Area prior to this current assessment. MSES impact assessments and calculations relative to MSES regulated vegetation will utilise this Queensland Herbarium certified amendment mapping. However, ground-truthed RE mapping undertaken by e2m as part of this current assessment will be utilised for habitat mapping for all other MSES values."* The department is concerned with the use of one set of RE mapping for regulated vegetation and a different set of RE mapping for habitat as both assessments apply to the same project area. Based on Section 5.1 (Vegetation Communities) and Figure 7 (Ground-truthed Regional Ecosystems) in Appendix C, it is understood that E2M has undertaken additional ground-truthing and identified discrepancies between the RE areas mapped during the field survey and those shown in the Queensland Herbarium-certified map amendment (MAR3577B). However, the assessment does not provide a quantitative comparison (in hectares) between the ground-truthed RE mapping and the MAR3577B mapping within the Centurion North project footprint, making it difficult to determine the extent of area variation between the two datasets. If significant differences are identified between the extent of the ground-truthed RE areas and the MAR3577B mapping, it would be more appropriate to repeat the significant residual impact assessment using the most recently conducted and validated mapping.	4.1 Provide clarification on whether different sets of RE mapping have been used for regulated vegetation and habitat mapping within the same project area.	Two versions of field-validated mapping were discussed and used in the assessment of MSES in the initial submission. However, following advice from DETSI, the MSES report has been amended to use the more detailed e2m RE mapping only to assess both regulated vegetation and habitat MSES for this Project.	Appendix C – Terrestrial Ecology Technical Report: Section 4.2, Section 5.1, Section 8.2 EA Amendment document: Section 6.4.1.1, Section 6.4.6.
		4.2 Update Section 5.1 of Appendix C to include a table that provides a detailed comparison of the extent (in hectares) of the ground-truthed RE areas within the Centurion North project footprint against the certified map amendment MAR3577B.	As per Item 4.1, as only e2m ground-truthed mapping has been discussed (i.e. all references to Kleinfelder and the certified map amendment has been removed from the amended MSES report) and used in the assessment of MSES, this comparison table has not been included in the report as it is no longer relevant to our assessment. Nonetheless for DETSI's information, an RE comparison of the two versions of mapping (MAR3577B certified map and e2m ground-truthed RE mapping) has been provided.	N/A
		4.3 Where a significant difference is identified between the extent of the ground-truthed RE areas and the MAR3577 mapping, repeat the significant residual impact assessment using the most recently conducted mapping.	The significant impact assessment for regulated vegetation MSES has been revised utilising e2m ground-truthed RE mapping. As a result, a residual significant impact has been triggered for of concern RE 11.8.11. The landscape fragmentation connectivity tool has also been updated to reflect e2m ground-truthed RE mapping. Revision of significant impact assessment for protected species' were not necessary as no changes to habitat mapping have been made.	Appendix C – Terrestrial Ecology Technical Report: Section 8.2, Section 8.4 EA Amendment document: Section 6.4.6.

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	Furthermore, Table 11 in Section 6.2 outlines direct impacts to vegetation communities within the disturbance footprint, indicating a notable difference between the mapped and ground-truthed areas for several REs, including 11.5.15, 11.5.3, 11.5.16, 11.8.5, and 11.8.11. If the E2M ground-truthing was undertaken after the MAR3577 map amendment, the impact mitigation measures, particularly environmental offset requirements derived from the significant residual impact assessment based on the MAR3577 mapping may not accurately reflect the actual extent of ground disturbance to prescribed matters. Therefore, the ground-truthed RE areas must be validated via a further RE mapping amendment by the Queensland Herbarium. This is necessary to ensure that the disturbance areas used in the significant residual impact assessment are accurate and appropriately reflect the most recent on-ground values.	4.4 Update the proposed impact mitigation measures to reflect the outcomes of the revised significant residual impact assessment undertaken as per RFI item 4.3.	The mitigation proposed for the Project are still relevant to the species and habitats proposed to be impacted and are in place following measures to avoid and minimize impacts, including to regulated vegetation. Further minimisation of impacts will be attempted during on-ground, finer scale construction activities, although these cannot be defined further at this stage.	Appendix C – Terrestrial Ecology Technical Report: Section 7.2, Section 7.3.1 EA Amendment document: Section 6.4.5.1 and Section 6.4.5.2.
		4.5 If required, take necessary steps to obtain RE mapping certification from the Queensland Herbarium to validate the ground-truthed results.	An RE amendment will be submitted to DETSI as a part of the RFI response and resubmission of the MSES assessment for the Project.	N/A
5	<u>Appendix A – Groundwater Assessment</u> <u>Executive Summary</u> This section states: *'Given the scale and location, the Project activities can be largely managed under the monitoring and compliance requirements of the existing EA and Centurion Coal Mine management practices that will be applied to the Project to minimise and/or prevent unauthorised harm to EVs from the Project.'* The department notes that it would be unacceptable to manage the groundwater impacts of this Project solely under the requirements of the Centurion Coal Mine EA. Therefore, the Centurion North EA will require amendment to include provision of groundwater monitoring as part of this EA amendment process. A detailed groundwater monitoring program is required to be presented which will provide the information required to support the development of a numerical groundwater model capable of adequately simulating the proposed project and its impacts on the groundwater system. The monitoring program will need to be capable of monitoring groundwater conditions (groundwater levels, quality and flow directions) prior to any project operations occurring and monitor any impacts as the project develops. The monitoring program will also require sufficient standpipe monitoring bores in the various units within the Permian formations and the Tertiary sediments (including the basalt, basalt sands and non-basalt Tertiary unit) to provide the data required.	5.1 Provide details of a groundwater monitoring program which will provide the information required to support the development of a numerical groundwater model capable of adequately simulating the proposed project and its impacts on the groundwater system.	Peabody are currently developing / implementing a groundwater monitoring network / program for the full CND project – this program is summarised in Appendix A – Groundwater Assessment.	Appendix A – Groundwater Assessment: Section 2.3 EA Amendment document: Section 6.1.2.2
6	<u>Section 1.2.1 Water extracted from CSG wells</u> This section states: *'Currently, Peabody estimates a total water production of 20 kilolitres (kL) over the operational life of one CSG well.'* The section goes on to assume the life of one CSG well is 21 months. No reference is provided as to how the water production has been determined.	6.1 Provide supporting information for the estimate of a total water production of 20 kilolitres over the operational life of one CSG well.	Description of proposed development activities now includes additional information on likely CSG well water production rates. Evidence is also provided in Appendix A, based on similar coal seam gas water production rates in Centurion South project. Average values of water production in those locations are approximately 5kL per day, making the 20kL per day number used for this assessment a very conservative value.	Appendix A – Groundwater Assessment: Section 1.2.1

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7	Section 2.2.1 Monitoring bore details This section provides some details of the hydrostratigraphy of the project area. Figure 2-3 provides some details of monitoring bores on a map. However, a table providing details of all monitoring bores, including the following information, has not been provided: • Location – coordinates, • Depth, • Screened depth, • Geologic unit monitored, • Length of water level record, and • Length of water quality record. A detailed description of the monitoring network is required to determine what information is available on which to base the assessment. The lack of such detail reduces confidence in the conceptualisation, numerical groundwater model and its predictions. It is further noted in Figure 2-3 that monitoring bores at Centurion, some of which located just south of this project, are not plotted on the figure. It is unclear that data from these bores was used in this assessment.	7.1 Provide details of all monitoring bores in a table that includes: • Location – coordinates, • Depth, • Screened depth, • Geologic unit monitored, • Length of water level record, and • Length of water quality record.	Available data on the current monitoring network and water level records has been provided, including a register of available bores for Centurion North and Centurion.	Appendix A – Groundwater Assessment: Section 2.3.1, Section 2.3.2, Section 2.3.4 EA Amendment document: Section 6.1.2.2
8	Section 2.2.1.3 Permian Stratigraphy This section provides some discussion on the Permian. Based on Figure 2-2, it is assumed that Permian formations, Fort Cooper Coal Measures, Moranbah Coal Measures and the Back Creek Group are present on site. However, there is no discussion of these formations in section 2.2.1.3. It is also assumed based on figure 2-2 that there are multiple coal seams present, most in the Moranbah Coal Measures and perhaps one at the base of the Fort Cooper Coal Measures. There is no discussion of the various coal seams in section 2.2.1.3 except to say that there are coal seams in the Permian. Other parts of the report appear to indicate that CSG will be removed from the Lower Goonyella seam and that the Goonyella middle seam is the target seam. The model has layers representing the RQ and GU seams as well as the Goonyella middle and lower seams. The hydrostratigraphy section should provide details of this geology as a basis for the rest of the report.	8.1 Provide additional information in section 2.2.1.3 on the Permian formations and the coal seams on site.	The representation of the FCCM within the model was not considered in detail as this formation is not targeted by the project and there are no receptors identified in this unit. The updated report includes additional detail on the hydrostratigraphy of the Permian formations, additionally, a table showing how the stratigraphic section has been translated to modelling layers is now included.	Appendix A – Groundwater Assessment: Section 2.2.1, Section 3.3 EA Amendment document: Section 6.1.2
9	Section 2.3.1 Water level information Figure 2-6 provides a hydrograph for basalt monitoring bore MB08. This is the only hydrograph provided for a standpipe bore in the entire report. Figure 2-7 provides hydrographs from a vibrating wire piezometer (VWP) for a period of 4 months starting in November 2011. It is not clear whether the VWP was equilibrated or representative of the geologic units being monitored. This impacts the reliability of the data.	9.1 Provide additional information to demonstrate groundwater flow direction and groundwater trends in the major geologic units at the project site, including the basalt and Permian formations and alluvium where present.	There is additional data that was considered in the assessment but not included in the report in an attempt to keep the report streamlined. The water level discussion now includes all the available hydrographs for the Project Area, a discussion of the data gaps, and groundwater contours for the Moranbah Coal Measures. It is considered that the alluvium is largely unsaturated although there is currently no available monitoring data for alluvium within the Project Area. Available data on basalt groundwater levels are presented in hydrographs, though no contours are shown as there is not enough data to present meaningful contours across the development area.	Appendix A – Groundwater Assessment: Section 2.3.1, Section 2.3.2, Section 2.3.4 EA Amendment document: Section 6.1.2.2

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	The only other water level data provided is in Figure 2-8 where contours are drawn based on water levels in exploration holes open to multiple Permian geologic units in 2011. They cover an area north of the project site. In relation to these contours section 2.3.1 states: *'These are considered to be low reliability water level estimates as they are likely to present as averaged piezometric level Permian strata that are exposed in the borehole (including coal and overburden). Based on these localised contours for data collected in 2011, the interpreted groundwater flow direction is to the south and west.'* It is noted that section 2.2.1.1 states that no water level data is available in the alluvium in the network. Further, there appear to be a number of basalt monitoring bores plotted on Figure 2-3. However, there are no groundwater elevation contours for the basalt provided based on this data or spot height (groundwater elevation) information using data from these bores. Overall, it is considered that the water level data presented in this application is limited in it's ability to represent the area for assessment. Further information is required to address data gaps, and better demonstrate the groundwater flow in project the area and surrounds.	9.2 Where there are obvious gaps in the data provide detailed advice as to how those data gaps are being addressed.	The current gaps will be addressed through the groundwater monitoring program that Umwelt are overseeing for the full CND project, additional detail is included on this program including locations of recently installed and proposed bores and the monitoring program currently occurring to build a baseline of groundwater conditions.	Appendix A – Groundwater: Section 2.3.4 EA Amendment document: Section 6.1.2.2
10	<u>Section 2.3.2 Water Chemistry</u> This section states: *'Alluvium: Variable salinity, but generally brackish to saline (up to 6,600 µS/cm, with an average of ~3,700 µS/cm), slightly alkaline pH (7.32 to 7.61) and sodium chloride dominated;'* It is not clear where this data comes from given the report states there are no alluvial bores in the network. The section also states: *'Permian Coal Measures: Limited data exists for monitoring bores screened within the coal measures outside of two rounds of grab samples in late 2011. Chemistry results from these sampling rounds indicated that groundwater in the coal measures is of significantly higher in salinity, and more alkaline compared to samples from the basalt and alluvium.'* It is not clear what bores the grab samples in late 2011 relate to. Additionally, no chemistry data is provided for those bores. In the basalt, a range of electrical conductivity and pH is provided but no details as to which bores were sampled and how water quality varies spatially (mapped) is provided. A piper plot is also provided for basalt, weathered basalt and Tertiary (assume non basalt) but it is not clear which bores are represented by these samples. Overall, there is limited connection between the statements on water quality and the supporting data for each unit. In order to enable sufficient assessment of the project, the application should address these information gaps.	10.1 Provide additional information that completes the water quality reporting to the greatest extent possible; and	The report discusses the available data and its suitability for the level of the current assessment. It also discusses the proposed groundwater quality data acquisition under the upgraded groundwater monitoring program. No additional data was available to be presented at this stage.	Appendix A – Groundwater Assessment: Section 2.3.1, Section 2.3.3, Section 2.3.4 EA Amendment document: Section 6.1.2.2
		10.2 If gaps remain provide advise as to how gaps in the water quality data will be addressed.	Discussion of water quality included a mistake in the reporting, with Tertiary Sediments screened in MB18R and PB03 reported as "alluvium". This has been corrected. By linking this discussion with the additional data included in the monitoring bore section, we show the data providence. Limitations remain with the availability and quality of sampling in the Permian coal seams due to the depth of these features. Summary information on the new groundwater monitoring locations and proposed monitoring program is presented in the report. It is understood this work will address data gaps with regard to water chemistry availability in each hydrostratigraphic unit, as discussed in the report.	Appendix A – Groundwater Assessment: Section 2.3.1, Section 2.3.3, Section 2.3.4 EA Amendment document: Section 6.1.2.2

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11	*Section 3.3 Model layers – Fort Cooper Coal Measures* Figure 2-2 indicates that the Fort Cooper Coal Measures overlies the Moranbah Coal Measures in much of the project and model area. Section 3.3 and Table 3-1 don't mention the Fort Cooper Coal Measures when describing the model layers. Section 3.3 states: *'The overburden was divided into three layers of equal thickness and pinch-out occurs where the target coal seam or interburden units come into direct contact with higher units (alluvium, regolith / weathered material, basal sands).'* Additionally, it is noted that Table 3-1 identifies layers 15 – 17 as Permian overburden 1, 2 and 3. However, it is unclear that the Fort Cooper Coal Measures is included in parts of layers 15 to 17. Similarly, Appendix A, Table A1 makes no mention of the Fort Cooper Coal Measures when describing hydraulic parameters used to represent the various model layers. Given that the Fort Cooper Coal Measures is a significant formation on site, it is important to clearly define how it has been represented in the numerical groundwater model.	11.1 Provide advice as to how the Fort Cooper Coal Measures have been represented in the numerical groundwater model.	Update has been made to the stratigraphy section with respect to the Fort Cooper Formation and the model approach can be made clearer through a side-by-side of the stratigraphy and the model layer design.	Appendix A – Groundwater Assessment: Section 2.2.1, Section 3.3 EA Amendment document: Section 6.1.2
12	<u>Section 3.5.1 General Head Boundaries</u> This section states: *'The model boundary conditions are presented in Figure 3-1. The general head boundary (GHB) condition was used primarily to represent the regional flow into and out of the model area. GHB cells have been assigned in all model layers along the general head boundaries indicated in Figure 3-1.'* A review of Figure 3-1 would appear to indicate that the model boundary conditions are not presented in Figure 3-1.	12.1 Provide additional advice in regard to the model boundary conditions.	The figure referred to in-text has been updated with the appropriate symbology and labels.	Appendix A – Groundwater Assessment: Section 3.1
13	<u>Sections 3.5, 3.6 and 3.7 Initial conditions</u> Section 3.5 states: *'The GHB water levels were assigned based on the topographic gradients beyond the model boundaries, most recently recorded water levels at monitoring bores and aligned with conceptualised regional flow behaviour (Section 2.3.1).'* Section 3.6 states: *'Initial heads were assigned based on the converged steady-state condition prior to the commencement of the proposed dewatering and underground mining activities.'* Section 3.7 states: Hydraulic Parameterisation *'To optimise the match between the measurements and the model simulated levels, the hydraulic properties (i.e., horizontal and vertical conductivity) for each hydraulic parameter zone were adjusted during an initial calibration phase.'* Limited information is provided in Section 3 of the report as to what measured or recorded water levels were used to support the development of initial heads and the steady state model.	13.1 Given the very limited measured and recorded water level data presented in the report, provide further information indicating what water level data was used to develop the steady state model.	This item is noted to be labelled 16.1 in the DETSI response, which has been corrected to 13.1. Initial heads applied in the model were informed by topography and contour mapping of observed groundwater elevations, interpreted by AGE (2012), and adjusted based on the converged steady-state condition (defined through manual calibration of hydraulic parameters as described in the following sections). Boundary conditions, including GHB, recharge and evapotranspiration introduced in Section 3.5 were applied during this steady-state period.	Appendix A – Groundwater Assessment: Section 3.5, Section 3.6, Section 3.8
		13.2 Provide a discussion on what limitations the lack of water level data places on the model predictions.	This item is noted to be labelled 16.2 in the DETSI response, which has been corrected to 13.2. Discussion included in the model limitations section of the report about how additional water level data that is collected within a broader range of the hydrostratigraphic units could help constrain initial heads, GHB settings and the calibration of the model.	Appendix A – Groundwater Assessment: Section 3.5, Section 3.6, Section 3.8

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14	Section 3.8 – Model Performance This section states: *'The model shows a reasonable fit between observed and modelled groundwater levels.'*	14.1 Provide supporting information that demonstrates a reasonable fit between observed and modelled groundwater levels.	This item is noted to be labelled 17.1 in the DETSI response, which has been corrected to 14.1. A scatter plot and associated discussion have been included, with groundwater level observations charted with modelled heads to demonstrate reasonable fit. In addition, the parameter ranges used in modelling are shown in Appendix C to demonstrate that there is a wide array of parameter uncertainty and to demonstrate conservatism in the impact assessment.	Appendix A – Groundwater Assessment: Section 3.8
15	Table 3-2 Groundwater model and data limitations This table states under the heading of measurement error: *'Bore logs and construction details available for most site bores, and long-term site water level data available for various units.'* The report provides only one hydrograph for a standpipe bore. It is MB08 in basalt.	15.1 Provide supporting information demonstrating that long term site water level data is available for various units.	The revised water level discussion now includes hydrographs of all available monitoring data for the Project area	Appendix A – Groundwater Assessment: Section 2.3.1, Section 2.3.2, Section 2.3.4 EA Amendment document: Section 6.1.2.2
16	Table 3-2 Groundwater model and data limitations This table states under the heading of scenario uncertainties – calibration: *'A steady state calibration to initial heads was performed. Lack of data at model bounds complicates assignment of boundary condition constant heads and, based on the declining groundwater level and change in storage observed in the model through out runs, the system is not in equilibrium with heads that match piezometric contouring of available data. This is likely to be due to groundwater abstraction in the southern area of site and additional data may address this limitation.'* Given DETSI's concern about the lack of reliable water level data to calibrate the model against, the statement above even further reduces confidence in the numerical groundwater model. Item 12 of this request raises an issue concerning the lack of water level data which is not addressed in the above statement as a limitation. Understanding on a range of limitations of the model is important for the assessment.	16.1 Provide discussion as to how the lack of reliable water level data may have influence the model limitations and inability of the model to reach equilibrium.	To calibrate the model, steady state run of model parameters and boundaries was evaluated against groundwater data summarised in AGE 2012. This was additionally evaluated using an extended transient period (in which boundary conditions do not change) to provide adequate starting heads for the areas where no hydraulic data was available. Heads reproduced in this period were a reasonable match for observed values, however no transient calibration was carried out - additional data being gathered through the expanded groundwater monitoring program should address this limitation. Lack of data at model bounds complicated assignment of boundary head conditions that contribute to calibration confidence. However, as the parameterisation section notes, parameter values are considered conservative such that predicted impacts are likely overestimated. The southern boundary condition has been reviewed and changed to drain cells rather than constant head cells at the location of the existing open cut mining (GHB elsewhere). This change, combined with re-evaluating the initial heads, resulted in much better model stability and largely addressed the model equilibrium issue.	Appendix A – Groundwater Assessment: Section 3.8
17	Section 4.3 Model predicted drawdowns Figure 4-3 demonstrates that predicted drawdown in layer 22 (GM seam) extends to the western and northern boundaries. The model boundary conditions at the lateral boundaries may therefore be unduly impacting model predicted drawdown. Additionally, it is noted that predicted drawdown in layer 22 ceases abruptly in the west where the target seam subcrops. However, there are no predicted drawdowns provided for layer 25 representing the Back Creek Group which adjoins layer 22 to the west.	17.1 Provide advice on whether the lateral model boundaries of the numerical groundwater model will be extended to reduce potential impact on model predicted drawdown.	The lateral model boundaries were not extended based on the drawdown results. Discussion has been included in the text about approach to model boundary definition. The numerical model developed for the full Centurion North development will have boundaries set at a distance well beyond the extent shown in this model.	Appendix A – Groundwater Assessment: Section 4.3 EA Amendment document: Section 6.1.3.2
		17.2 Provide predicted drawdowns in layer 25 representing the Back Creek Group.	Back Creek Group drawdown has been extracted and discussed in the text.	Appendix A – Groundwater Assessment: Section 4.3 EA Amendment document: Section 6.1.3.2

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18	Section 4.4 – Sensitivity analysis This section provides information on changing predicted drawdown in basalt monitoring bore MB09 as a result of varying, hydraulic conductivity, storage coefficient and recharge. Whilst it is considered that this provides some additional information it does appear to provide a very narrow focus for a sensitivity analysis. It is considered that a much better appreciation of the impact of these changes would have been gained by changing parameters in the major layers and then presenting and comparing the changed predicted drawdown extents in those layers as would typically occur with a sensitivity analysis.	18.1 Provide advice as to why the predicted drawdown extents were not provided as outputs to the sensitivity analysis.	Results from the sensitivity simulations are presented via hydrographs to provide a clearer comparison between simulations using differing hydraulic parameters. Hydrographs present a clearer illustration of how sensitive drawdown is in response to changes in parameter values (relative to the base case) because all sensitivity cases can be presented in a single figure. In addition, the full parameter sets are provided in Appendix B for assessment. Sensitivity case hydrographs show that a conservative approach to parameterization was maintained throughout the design of the model.	Appendix A – Groundwater Assessment: Section 4.4, Appendix B
19	Appendix A, Table A1 – Parameter values The figures for Specific Yield in general in this table seem low, particularly for the alluvium where a range of 1-10% would usually be expected. It is unclear if Table A1 provides 0.001 or 0.1%. In any case this requires clarification, and the use of either value requires justification.	19.1 Provide advice as to what data supports the use of a Specific Yield of 0.1% to represent alluvium in the numerical groundwater model.	Previously reported specific yield value for alluvium was a typographic error in reporting and has been updated. A value of 1% was taken as conservatively low (i.e. drawdown reflected more readily) value. No local hydraulic testing data was available to constrain this number.	Appendix A – Groundwater Assessment: Section 4.4, Appendix B
20	PRCP schedule Section B – Final site design and reference maps This amendment seeks to update Figure 1 – Final Site Design and Figure 2 – Reference Map in Section B of the PRCP schedule. It is recommended that the updated Figure 1 and 2 be provided as separate files, preferably in a high-resolution image format (JPEG, TIF, etc.) to facilitate their inclusion in the final schedule.	20.1 Provide the updated versions of Figure 1 and Figure 2 as separate files, preferably in a high-resolution image format.	High-resolution images (.jpg) and PDF have been provided for the proposed figures for update in the PRCP Schedule. As noted in the updated PRCP, the following figure updates are proposed: • Figure 1 with Figure 10-1; and • Figure 2 with Figure 10-2.	Attached images and PDF documents
21	Section C – Post-mining land uses The proposed amendment seeks to extend the date of land availability (a total area of 234 ha) for rehabilitation from 2028 to 2055, representing a 27-year extension. Consequently, the completion date for the final rehabilitation milestone (RM7) is deferred to 10 December 2075. Given that the project is planned for completion by 2031, it is expected that the disturbed land subject to this amendment should be made available for commencement of first milestone (RM1) from 2032 (at least within 6 months after the area becomes available for rehabilitation). The application supporting report or the updated PRC plan does not provide clear justifications as to why the disturbed land associated with RA1 will not be available for rehabilitation until 2055. Therefore, the department requests further justification for the proposed timeframes, specifically regarding the availability of land for rehabilitation and the achievement of subsequent rehabilitation milestones relevant to RA1.	21.1 Provide justification for why the land cannot be made available for progressive rehabilitation immediately following the completion of the project subject to this EA amendment.	The updated PRCP submitted plans for the commencement of rehabilitation of the entire Centurion North Development area following the completion of all works in 2055. However, in light of DETSI comments, the PRCP schedule has been amended to commence rehabilitation of disturbance associated with this amendment. This will result in the commencement of the first milestone (RM1) for rehabilitation by 2033, resulting in a 5-year extension. Rehabilitation will be completed by 2053.	EA Amendment document: Section 4.2.2. PRCP: Section 2.4.1, PRCP Schedule (Appendix 2)
		21.2 If required, revise the timeframes for the availability of land for rehabilitation as well as the associated rehabilitation milestones for RA1 in the schedule.	The updated PRCP has been revised to commence rehabilitation of disturbance associated with this amendment, as discussed above. Updates to reflect this change have been made in Section 4.2.2 of the EA Amendment Application document, Section 2.4.1 of the PRCP, and the PRCP Schedule.	

Item #	Information Sought	Requested Actions	Response	Corresponding Section

22	<u>Section C – Post-mining land uses</u>
	PRCP Schedule RA1 currently designates 234 ha for exploration activities, early works and ancillary infrastructure. However, there is uncertainty regarding the specific surface disturbance associated with early works as it is not specified in the schedule. The consolidation of all these activities under RA1 makes it difficult to clearly identify and define specific rehabilitation criteria for disturbances associated with the newly proposed activities, such as underground gate roads, gas risers, service boreholes, SIS wells and VPWs.
	It is not clear that the current rehabilitation milestone criteria proposed for the 234 ha of collective disturbance under RA1 adequately address the potential impacts of the newly proposed activities to the land to ensure the achievement of a safe, stable, non-polluting, and self-sustaining post-mining land use (PMLU).
	To enhance the clarity and effectiveness of rehabilitation milestone criteria, it is recommended that specific milestone criteria (SMART) be developed to address potential impacts of the proposed various disturbances associated with the project.
		22.1 Provide clarification on how the proposed milestone criteria under RA1 in the amended schedule address the potential impacts of the newly proposed activities.	Proposed exploration activities include boreholes for sampling and exploration. Proposed early works activities include construction of SIS wells, gas risers, service boreholes, bleeder shaft, disturbance for future surface works, construction of gate roads and Underground In-Seam gas drainage works.
			Both exploration activities and early works activities will require new access tracks and a laydown area.
			The rehabilitation methodology for surface disturbances from the exploration and early works activities (direct surface disturbance) is anticipated to be the same. All surface infrastructure (e.g. drill pads, wells, boreholes, risers, shaft, laydown area) will require decommissioning and removal (RM1), followed by remediation of any contaminated land (RM2), landform development and reshaping (RM3) and revegetation (RM4, RM5, RM6, RM7). As there are no additional rehabilitation criteria required for rehabilitation, all rehabilitation has been consolidated under the same RA.
			As discussed in Section 7.4.2.1 of the updated PRCP, subsidence as a result of underground activities (including underground gate roads and UIS gas drainage works) are unlikely to cause adverse surface effects.
			Subsidence monitoring is currently included in the monitoring program, as outlined in Section 9.4 of the PRCP.
			In the unlikely event that subsidence impacts are observed, maintenance actions have been added to Section 9.6 of the PRCP.
			
			These maintenance actions include:
			• If subsidence occurs, development and reshaping is completed to achieve a free-draining landform;
			• If erosion occurs as a result of subsidence, remediate the eroded landform;
			• Where remediation has occurred as a result of subsidence impacts, the following is completed:
			  ○ Topsoil is placed, as required; and
			  ○ Seeding is completed in accordance with the recommended pasture seed mix and seeding rates.
			In addition, the remediation of subsidence impacts has been added to RM7 in Section 10.2 of the PRCP.
				PRCP: Section 9.6, Section 10.2

		22.2 If required, develop specific milestone criteria to address potential impacts of the newly proposed activities and provide the revised PRCP schedule.	Remediation of subsidence impacts has been added to RM7, as outlined in Section 10.2 of the PRCP and the PRCP schedule.	

Item #	Information Sought	Requested Actions	Response	Corresponding Section
23	Section C – Post-mining land uses It is understood that most of the additional disturbance area proposed consists of cleared land and efforts will be made to minimise the clearance of mature trees for drill sites and access tracks. However, it is noted that some drill sites will encroach upon remnant vegetation (endangered or of concern) as depicted in Figures 6-12 and 6-13 of the supporting report. The current PRCP schedule only identifies cattle grazing as the post-mining land use (PMLU). Therefore, it is unclear how the proposed PRC plan addresses the reestablishment of vegetation and the associated monitoring plan for remnant vegetation areas affected by drilling activities and access tracks. To address this, it is recommended that areas of remnant vegetation proposed for clearing be designated as a separate rehabilitation area (RA). These areas should be managed in accordance with relevant SMART criteria to ensure effective rehabilitation and facilitate the monitoring of vegetation reestablishment.	23.1 Provide clarification on how the proposed PRC plan and schedule incorporate measures to rehabilitate the revegetation of remnant vegetation areas impacted by the proposed surface disturbances.	Section 2.2.11 of the PRCP identifies the pre-mining land use of the Centurion North MLs as cattle grazing. The achievement of a post-mining land use (PMLU) of cattle grazing is consistent with the outcomes of consultation completed to date. There is no legislative requirement for mined land to be rehabilitated to achieve the same or similar vegetation communities. The proposed disturbance associated with the mining activity is assessed against the QLD Offsets Policy. Offsets will be provided in accordance with this policy. As the PMLU is currently approved as cattle grazing in the PRCP and this is consistent with stakeholder consultation undertaken to date, a change to the current PMLU is not proposed.	N/A
		23.2 If required, designate areas of remnant vegetation proposed for clearing under a separate Rehabilitation Areas (RA) and establish relevant SMART criteria to ensure successful rehabilitation and effective monitoring of revegetation.	In light of the discussion above, no changes are required to the PRCP schedule.	
24	Grazing species mix The MSES assessment provided in Appendix C identifies two conservation significant flora species: king bluegrass (*Dichanthium queenslandicum*) – vulnerable; and finger panic (*Digitaria porrecta*) – near threatened which are listed under the NC act. Additionally, the potential for significant residual impacts to koala has been identified. However, the proposed seed mix is not representative of these grazing species or suitable koala feed tree species. It is recommended that the seed mix be enhanced to include species impacted by the project, including the identified grazing species and koala feed tree species.	24.1 Update the proposed seed mix to incorporate king bluegrass (*Dichanthium queenslandicum*) and finger panic (*Digitaria porrecta*), as well suitable koala feed tree species.	The proposed pasture mix has been reviewed and updated with consideration of feedback from DETSI. These updates include the addition of the following species: • King bluegrass (*Dichanthium queenslandicum*); • Finger panic (*Digitaria porrecta*); • Brown's Box *(Eucalytpus brownii);* • River Red Gum *(Eucalyptus camaldulensis);* • Narro-leaved Ironbark *(Eucalyptus crebra);* • Mountain Coolibah *(Eucalyptus orgadophila);* and • Forest Red Gum *(Eucalyptus tereticornis).* The eucalyptus species are Locally Important Koala Tree (LIKT) species that have been identified in the study area. The composition of the pasture mix used during rehabilitation will consider the surrounding regional ecosystems, land use, the environment (i.e. availability of water), and local seed availability. Relevant updates have been made in Section 7.1.8 and Section 10.2 of the PRCP Schedule, and Section 4.2.3 of the EA Amendment Application document.	EA Amendment document: Section 4.2.3 PRCP: Section 7.1.8, Section 10.2, PRCP Schedule (Appendix 2)