

Our ref: DOC22/1017602
Your ref: MP08_0184-Mod 6

Mr Jack Turner
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Department of Planning and Environment
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Dear Mr Turner

Ulan Coal Mine – Underground Mining Extension – Modification 6

Thank you for your request, via the Major Projects portal, on 16 November 2022 to the Biodiversity, Conservation and Science Directorate (BCS) of the Department of Planning and Environment (DPE) inviting comments on the Environmental Impact Statement (EIS) for Ulan Coal Mine Modification 6.

Having undertaken a review of the EIS material, BCS has identified instances where the Biodiversity Assessment Method (BAM) has been incorrectly applied, and where further assessment or justification is required. Issues identified by BCS include:

- species credit species being excluded from assessment without appropriate justification,
- insufficient survey effort or justification for the exclusion of species being undertaken for some species credit species,
- uncertainty regarding whether the entire disturbance footprint has been assessed for impacts to biodiversity,
- assessment and identification of residual impacts from indirect and prescribed impacts, and
- assessment of Serious and Irreversible Impacts (SAII).

These matters will need to be addressed to ensure the final biodiversity credit obligation can be calculated correctly. Addressing these matters may require:

- additional survey work, the assumption of presence, or the preparation of expert reports,
- updates to the case in the Biodiversity Assessment Method Calculator (BAM-C) and spatial data, and
- additional evidence, assessment and justification provided in the Biodiversity Development Assessment Report (BDAR).

The BDAR includes a development footprint and a 'maximum parameters' area. The 'maximum parameters' area includes options to allow for flexibility in deciding upon the final design of the development footprint.

While BCS supports flexibility, assessors and proponents must operate within the Biodiversity Offset Scheme (BOS) framework. Options must be capable of being assessed in accordance with the BAM, including maintaining an auditable and traceable log of the credit requirements. It is unclear how the 'maximum parameters' BAM-C in its current form can be used to trace final credit requirements following selection of the final design. A staged approach would provide flexibility in accordance with the BOS.

BCS's biodiversity recommendations are provided in **Attachment A** and detailed comments are provided in **Attachment B**.

If you require any further information regarding this matter, please do not hesitate to contact Kate Tierney, Senior Conservation Planning Officer, via kate.tierney@environment.nsw.gov.au or (02) 4904 2782.

Yours sincerely

A handwritten signature in dark ink, appearing to read 'Sarah Carr', is positioned above the printed name.

Sarah Carr
Director North West
Biodiversity, Conservation and Science Directorate

31 January 2023

Attachment A – BCS's Recommendations

Attachment B – BCS's Detailed Comments

BCS's recommendations

Ulan Coal Mine Modification 6 – Environmental Impact Statement

BOS	Biodiversity Offset Scheme
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	<i>Biodiversity Conservation Act 2016</i>
BCS	Biodiversity, Conservation and Science Directorate
BC Regulation	<i>Biodiversity Conservation Regulation 2017</i>
BDAR	Biodiversity Development Assessment Report
CEEC	Critical Endangered Ecological Community
EIS	Environmental Impact Statement
MNES	Matters of National Environmental Significance
PCT	Plant Community Type
SAll	Serious and Irreversible Impacts
TEC	Threatened Ecological Community
TBDC	Threatened Biodiversity Data Collection
VI score	Vegetation Integrity Score

Recommendations

Options for project flexibility must be consistent with the BAM and have an auditable and traceable log of the credit requirements

- 1.1 Update BDAR to comply with BAM by including assessment of all areas likely to be impacted by the project, including the final development footprint.
- 1.2 Any development outside the development footprint and the area assessed in the 'maximum parameters' assessment will require a modification.
- 2.1 The maximum parameters approach presented in the BDAR is not implemented. The development should instead be staged in accordance with Recommendation 3.1 and 3.2.
- 3.1 Take a staged approach to the proposal by creating separate BAM-C cases for each option to allow for the flexibility of the development footprint.
- 3.2 Update the BDAR to reflect the proposed staging approach.
- 3.3 Assess and calculate the maximum offset liability for the proposed access track and buffer.

Aspects of the development footprint are not clearly articulated in the BDAR

- 4.1 Update the BDAR to include all areas of surface disturbance.

Justification of avoidance and minimisation methods require revision

- 5.1 Refine the location of the proposal to avoid direct and indirect impacts on native vegetation, threatened species, threatened ecological communities and their habitats in accordance with BAM.
- 5.2 Detail the avoidance measures that have been used to refine the location of the proposal.

Candidate species assessments require review – inadequate exclusion of species will impact on the credit obligation

- 6.1 Obtain an expert report to determine the presence or absence of the *Monotaxis macrophylla*, or assume presence.
- 7.1 Conduct a targeted survey to determine the presence or absence of the Striped legless lizard, obtain an expert report or assume presence.
- 8.1 Provide evidence, via survey results, to support the assertion that there are no breeding camps for Grey-headed flying-fox at the site.
- 9.1 Update the BDAR with additional evidence to demonstrate adequate survey effort or determine presence/absence using available alternatives.
- 10.1 Update the BDAR with additional evidence to demonstrate adequate survey effort or determine presence/absence using available alternatives.
- 11.1 Provide further justification that that the targeted survey effort undertaken for candidate-species credit species surveyed partly outside a recommended survey month is adequate to determine the absence of these species from the subject site.
- 12.1 Provide further justification to support the adequacy of targeted field survey for Pink-tailed legless lizard species that were considered to have a low detection probability.
- 13.1 Clarify or revised the species polygons for Large-eared pied bat and Eastern cave bat to align with BAM.
- 14.1 Review species polygons for Barking owl and *Commersonia procumbens* to incorporate all potential habitat for the species.
- 15.1 Provide spatial layers for each of the species' polygons.

Assessment of prescribed and indirect impacts associated with the construction and operation of the project require review

- 16.1 NSW Planning engage an independent expert to provide advice on the impacts of subsidence on hydrology and groundwater.
- 16.2 The BDAR should address the potential for the proposed modification to result in impacts to biodiversity values caused by subsidence.
- 17.1 The assessor must quantify credits to be offset for threatened species that will receive residual prescribed impacts resulting from the proposal, based on a maximum potential impact from the proposed modification, in consultation with BCS.
- 17.2 An adaptive management plan containing a trigger, action, response plan, should be developed that reduces and mitigates prescribed impacts on threatened bats.
- 18.1 A full assessment of the extent of impacts, including predicted consequences to the threatened entities, resulting from impacts of the proposal on water bodies, water quality and hydrological processes should be conducted in accordance with BAM.

- 18.2 The assessor must quantify credits to be offset for threatened species that will receive residual prescribed impacts resulting from the proposal, based on a maximum potential impact from the proposed modification, in consultation with BCS.
- 18.3 An adaptive management plan containing a trigger, action, response plan, should be developed that reduces and mitigates prescribed impacts on water bodies, water quality, and hydrological processes.

Assessment of cumulative impacts requires review

- 19.1 An analysis of similar developments in the surrounding area (existing and proposed) should be included to provide a cumulative impact assessment for biodiversity values.

Avoidance and appropriate assessment of Serious and Irreversible impacts will require revision

- 20.1 Further information should be provided to justify why the development footprint cannot be redesigned to avoid the loss of White Box – Yellow Box – Blakely's Red Gum Woodland CEEC.
- 20.2 Revise the SAI assessment for White Box – Yellow Box – Blakely's Red Gum Woodland CEEC to fully address section 9.1.1 of the BAM.
- 21.1 Undertake an SAI assessment for all relevant SAI potential entities, including the Large-eared pied bat and Large bent-wing bat, in accordance with section 9.1.2 of the BAM.

Important aspects of the BAM-C cases require revision – errors will impact on the credit obligation

- 22.1 Ensure that all representative plot data collected for each vegetation zone at the subject site, is entered into all applicable BAM-C cases.
- 23.1 Review the BDAR, BAM-C and spatial data to ensure that all data sources are consistent.

SMART principles must be applied when preparing pos-consent management plans

- 24.1 Ensure post-consent adaptive management plans are prepared in accordance with SMART principals and contain quantifiable triggers for adaptive management

Minor updates to the BDAR are required to ensure consistency with the BAM

- 25.1 The BDAR should be certified by the accredited assessor.
- 25.2 The BDAR should include an assessment of compliance with the minimum information requirements including Table 24 and 25 of BAM.
- 26.1 Revise mapping to comply with the requirements in the BAM.

BCS's detailed comments

Ulan Coal Mine Modification 6 – Environmental Impact Statement

Options for project flexibility must be consistent with the BAM and have an auditable and traceable log of the credit requirements

1. Amendment to the locations assessed in the BDAR following approval will require a project modification

Section 2 of BAM states:

“For proposals other than an application for a biodiversity stewardship agreement, the introduction to the BAR must:

- a. *Clearly identify the boundary of the subject land that shows the operational footprint and the*
- b. *construction footprint for any additional clearing associated with temporary/ancillary construction facilities and infrastructure”*

Section 1.2 of the BDAR states:

“Should the Proposed Modification be approved, the final infrastructure locations will be determined once the mine plan has been finalised and will be micro-sited to avoid disturbance to biodiversity values as much as possible. As such, the final locations may potentially be outside the corridor assessed for biodiversity impact purposes as part of the maximum parameters approach. A biodiversity due diligence exercise will be conducted at the relevant time and UCMPL will ensure that the biodiversity impacts associated with the final infrastructure locations will be the same or less than those assessed under the maximum parameters assessment.”

BCS does not support the application of a biodiversity due diligence exercise to amend the final location of the proposal. Assumptions cannot be made about biodiversity values for areas that have not been assessed in the BDAR.

Biodiversity credit calculations for the project are quantified according to the spatial extent of the proposed development footprint and the ‘maximum parameters’ areas. The inclusion of any additional areas of impact to biodiversity values, beyond the scope of the areas assessed in the BDAR and EIS would require a modification to the approved project.

Recommendation

- 1.1 Update the BDAR to comply with BAM by including assessment of all areas likely to be impacted by the project, including the final development footprint.
- 1.2 Any development outside the development footprint and the area assessed in the ‘maximum parameters’ assessment will require a modification.

2. The maximum parameter approach is not supported

Section 7.14(4) of the BC Act states:

“A condition to retire biodiversity credits is required to be complied with before any development is carried out that would impact on biodiversity values. If the retirement of particular biodiversity credits applies to a stage of the development, compliance with the

condition for their retirement is postponed until it is proposed to carry out that stage of the development.”

Section 1.2 of the BDAR outlines the ‘maximum parameter’ approach, with options for Area 1, 2 and 3, as follows:

- “1. The indicative Development Footprint has been assessed and credits calculated in the usual manner in accordance with the BAM.*
- 2. In addition, a ‘maximum parameters’ assessment has been completed considering the infrastructure contingency options provided by UCMPL. The maximum impacts of the combination of the indicative Development Footprint layout and each of the contingency options have been determined for ecosystem and species credits (impact areas defined and credits calculated)...*
- 3. Should the Proposed Modification be approved, the final infrastructure locations will be determined once the mine plan has been finalised and will be micro-sited to avoid disturbance to biodiversity values as much as possible...*
- 4. The Biodiversity Management Plan (BMP) will be updated to include the final credits required to be retired for each stage of development, based on the credit per hectare calculated in the maximum parameters assessment. Where the updates to the layout and recalculation of final BAM credits can be done using existing BAM survey data this will occur. Should the footprint vary sufficiently to require additional BAM data collection, this data would be collected at the appropriate time to ensure the BAM minimum requirements are met. An updated BAM calculator will be prepared, and the outcomes consulted with BCS and documented in the BMP. This would ensure that the credits retired are based on the final detailed design. Credits would then be retired as per the BMP (based on the final detailed design) with updates to the BMP to be made before each stage of surface development and approved by DPE.*
- 5. Importantly, the maximum parameters approach uses the infrastructure contingency infrastructure options to consider the worst-case direct impact area for each plant community type (PCT)/critically endangered ecological community (CEEC), i.e. the highest level of direct impact that would occur for each PCT, rather than a cumulative assessment of all options. Credits have been generated for the PCTs impacted along with the same threatened species used in the assessment of the Development Footprint.”*

BCS notes that the proponent has submitted two finalised BAM-C cases, one for the development footprint and another for the ‘maximum parameters’ assessment. It is unclear how the ‘maximum parameters’ BAM-C case could be used, without further amendment via a reduction to account for the unused options.

BCS does not support the maximum parameters approach. There is potential for all areas included in the maximum parameters calculation to be cleared if this is included in the conditions of consent. In addition, there is no way to track and audit the retirement of biodiversity credits.

Recommendation

- 2.1 The maximum parameters approach presented in the BDAR is not implemented. The development should instead be staged in accordance with Recommendation 3.1 and 3.2.

3. A staged approach should be implemented for the different options

The Biodiversity Offset Scheme (BOS) allows for the staged retirement of credits, providing some flexibility of offsetting to proponents. A staged approach allows for the retirement of the relevant biodiversity credits attributed to each stage, permitting only the credit obligation related to the stage under construction to be retired prior to impact occurring, rather than the entire credit obligation.

BCS considers that a BAM-C (child) case should be created for each option for Areas 1-4 in the development footprint. This would create a viable and flexible framework for the proponent to retire the credits for each BAM-C case, as each option is selected. For example, a separate BAM-C case should be created for each of the Options 1-9 in Area 1, Options 1-4 for Area 3, and for Area 4. The options not selected for the proposal can be discontinued.

A staged offset delivery strategy should be detailed in the BDAR. The options approach should be clearly outlined, identifying that each option is represented by a separate BAM-C case for each potential stage of the proposal, with the intention to select only one option for each Area 1, 3 and 4.

The quantum and types of credits calculated for each individual stage should be clearly presented in the revised BDAR.

The buffer for the proposed access track (Area 2), should include the maximum total impact required for construction, as this buffer will not be able to be staged.

Recommendations

- 3.1 Take a staged approach to the proposal by creating separate BAM-C cases for each option to allow for the flexibility of the development footprint.
- 3.2 Update the BDAR to reflect the proposed staging approach.
- 3.3 Assess and calculate the maximum offset liability for the proposed access track and buffer.

Aspects of the development footprint are not clearly articulated in the BDAR

4. Confirm that all proposed surface impacts have been included within the development footprint

Section 2 of BAM states:

“For proposals other than an application for a biodiversity stewardship agreement, the introduction to the BAR must:

- a. *Clearly identify the boundary of the subject land that shows the operational footprint and the*
- b. *construction footprint for any additional clearing associated with temporary/ancillary construction facilities and infrastructure”*

Section D in Appendix D – Maximum Parameters Impact Area Calculations in the BDAR states:

“The Tables combine the total Area of the fixed, assessed Development Footprint areas for which no contingency is required (i.e Area 3, less the area of the Pad site and Area 4) with the combined maximum potential impact areas for the Ulan West and Ulan Underground contingency areas and the Access Track buffer.”

Section 4.2.5 of the BDAR states:

“Areas of surface infrastructure may only require short term disturbance (such as for access to and drilling of boreholes), in which case the disturbed area will be rehabilitated with the goal to stabilise the ground against erosion and to re-establish native plant species representative of the disturbed vegetation.”

Figure 3.3 Maximum Parameters Area in the BDAR shows the location of the Proposed Infrastructure (Footprint Assessed in Mod 6 BDAR) relative to the location of the Ulan Underground Infrastructure Pad Options, being Areas A, B, C and D. None of the Ulan Underground

Infrastructure Pad Options, are included within the Proposed Infrastructure (Footprint Assessed in Mod 6 BDAR).

It is unclear if all surface infrastructure components required for the project have been included within the development footprint. If the intention of the proposal is to clear native vegetation at one of the Ulan Underground Infrastructure Pad Options, then at least one option i.e., Area A, should be included in the Development Footprint, and the Maximum Parameters Area calculations.

All areas of disturbance must be clearly identified in the BDAR, as they represent direct impacts to biodiversity values. The BDAR must identify the location(s) and total area of this disturbance and include this area in the development footprint.

Recommendation

4.1 Update the BDAR to include all areas of surface disturbance.

Justification of avoidance and minimisation methods require revision

5. Effort to avoid impacts to biodiversity is inadequate

Section 6.4(1) of the BC Act states:

“For the purposes of the biodiversity offsets scheme, the biodiversity conservation measures to offset or compensate for impacts on biodiversity values after any steps taken to avoid or minimise those impacts are as follows—

- a) the retirement of biodiversity credits,*
- b) other actions that benefit the biodiversity values of the impacted land or other biodiversity values.”*

Section 1 of the BAM Operational Manual Stage 2 states:

“Inadequate consideration of avoiding and/or minimising biodiversity impacts can compromise the approval of a development application.”

Section 7.1.1 of BAM states:

“Locate the proposal to avoid or minimise direct and indirect impacts on native vegetation, threatened species, threatened ecological communities and their habitat

- 1. Knowledge of biodiversity values should inform decisions about the location of the proposal. The initial assessment of biodiversity values from Stage 1 may be used to inform the early planning of the route or location of a proposal.*
- 2. Selecting a final proposal location may be an iterative process. Decisions may need to be revisited after all field surveys have been completed.*
- 3. Impacts from clearing native vegetation and threatened species habitat can be avoided or minimised by locating the proposal in areas:*
 - a. lacking biodiversity values*
 - b. where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a low vegetation integrity score)*
 - c. that avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or a highly cleared PCT.*

- d. *outside of the buffer area around breeding habitat features such as nest trees or caves.”*

Section 4 of the BDAR states:

“UCMPL has sought to avoid and minimise potential impacts on ecological values throughout the Proposed Modification planning process. This included designing the Proposed Modification to maximise the use of existing mining facilities and consideration of the placement of essential infrastructure to avoid disturbance to native vegetation and habitats, where practicable.”

The Executive Summary section of the BDAR states:

“The Proposed Modification was determined to be a controlled action by the Minister for the Environment and Water due to likely significant impacts on:

- White box – Yellow Box – Blakely’s Red Gum Woodland and Derived Native Grassland Critically Endangered Ecological Community.*
- Large-eared Pied Bat(Chalinolobus dwyeri) – vulnerable species.”*

Figure 1.2 Proposed Modification Overview shows the location of the Proposed Modification Area, including Areas 1, 2, 3 and 4 (the Development Footprint) is dominated by woody vegetation.

Figure 6.4 Maximum Parameters Area CEEC Extent shows the extent of large, connected, and continuous areas of White Box – Yellow Box – Blakely’s Red Gum CEEC within the Proposed Project Approval Boundary. This CEEC is prevalent across Areas 1, 2 and 3 for the Proposed Infrastructure (Footprint Assessed in Mod 6 BDAR), including across all options.

Figure 3.12 Species Polygons shows the Proposed Access Track Corridor which passes through the Species Polygon for Large-eared pied bat and Eastern cave bat.

The proponent has selected a range of options for Area 1 and Area 3, and a buffer for Area 2, with the intention of selecting options with the least impact on biodiversity. BCS notes that none of the options or buffers proposed for Areas 1, 2 or 3 avoid areas with important biodiversity values. White-Box CEEC is prevalent across all options for Areas 1, 2 and 3 in the development footprint. The buffer area provided to give flexibility for Area 2 provides negligible opportunity to reduce the area of impact on the species polygon for Large-eared pied bat and Eastern cave bat.

It does not appear that the location of significant biodiversity values was considered in determining the location of options. A merit assessment to determine the least impactful options for each area in the development footprint is not undertaken in the BDAR. The BDAR outlines the important biodiversity values which will be impacted by the proposal, including nationally listed threatened species and communities. None of the options presented provide substantial difference when considering impacts on important biodiversity values.

BCS considers the ‘maximum parameters’ approach does not conform to the BAM requirement to avoid and minimise impacts to biodiversity. Attempts must be firstly to avoid, and then to minimise impacts on native vegetation. Where possible, the proponent should try to locate the development footprint to avoid impacts as required by the BAM.

BCS recommends that the proponent consider refining the locations of surface infrastructure to avoid impacts on important biodiversity values identified in the BDAR.

Recommendations

- 5.1 Refine the location of the proposal to avoid direct and indirect impacts on native vegetation, threatened species, threatened ecological communities and their habitats in accordance with BAM.
- 5.2 Detail the avoidance measures that have been used to refine the location of the proposal.

Candidate species assessments require review – inadequate exclusion of species will impact the credit obligation

6. Justification for removal of *Monotaxis macrophylla* from the candidate species list is not adequate.

The General Notes section of Threatened Biodiversity Data Collection (TBDC) for *Monotaxis macrophylla* states:

“Survey within 6 months of disturbance or fire, if possible. Species is a short-lived annual, and will not be present unless a recent disturbance/fire event has occurred and triggered germination. Strongly recommend expert report to discount presence or absence, or detection by soil seed analysis.”

Table 2.3 Predicted Species Credit Species That Were Not Retained as Candidate Species for Survey in the BDAR includes the following reason for removing *Monotaxis macrophylla* (Large-leafed Monotaxis) from the candidate list for survey as:

“Given the significant distance from known records of this species, and the absence of fire for an extended period of time, it is considered that the habitat constraints for this species are not present within the development footprint.”

BCS notes that there are no habitat constraints listed for this species in the TBDC. The proposal site is within the known distribution for *Monotaxis macrophylla*. Although the presence/absence of records for a specific species may be used to inform the overall assessment, the absence of records cannot be used to exclude candidate species from the requirement for targeted survey.

The removal of *Monotaxis macrophylla* is not consistent with the assessment requirements set out in Steps 2 and 3 of Section 5 of the BAM. If *Monotaxis macrophylla* cannot be removed from the list of candidate species credit species, assessors must proceed to BAM Step 4: Determining the presence of a candidate species credit.

BCS notes that *Monotaxis macrophylla* cannot be assumed to be absent at a site based on the time since last fire exceeding six months. Given the conditions outlined by the proponent regarding time since last fire, survey would not be an appropriate method for determining species presence or absence. Instead, presence or absence of the species should be determined according to an expert report, or alternatively, the species can be presumed to be present at the subject site.

Recommendation

6.1 Obtain an expert report to determine the presence or absence of the *Monotaxis macrophylla*, or assume presence.

7. Justification for removal of Striped legless lizard from the candidate species list is not adequate.

Table 2.3 Predicted Species Credit Species That Were Not Retained as Candidate Species for Survey in the BDAR includes the reason for removing Striped legless lizard (*Delma impar*) from the candidate list for survey as:

“The Development Footprint is located outside of the known geographical range for the species. The closest records are in the Muswellbrook/ Denman area approximately 130 km east of the Development Footprint. No further assessment is required.”

The removal of Striped legless lizard from the candidate species list is not consistent with the assessment requirements set out in Steps 2 and 3 of Section 5 of the BAM. A species can only be removed from the list if:

- a. The assessor can manually apply any relevant geographic limitations to the species, which are based on information collected from BioNet Atlas, where the site is located outside the defined geographical area.
- b. the assessor determines that none of the habitat constraints for the species are present on the site. Documentation in the BDAR should reflect the TBDC information and evidence that the features are not present (field data).
- c. the species is a vagrant in the IBRA subregion. Vagrancy is taken as the record being well outside the species range or natural distribution. The suspect record will need to be reviewed against the species known distribution and the assessor will need to confirm with species experts that it is likely to be a vagrant. If agreed by experts the assessor should contact BCS to have the record quarantined from BioNet Atlas and re-labelled as vagrant. The BDAR will need to contain supporting information such as who was contacted, when, their credentials and the resultant response from BCS.
- d. After carrying out a field assessment, the assessor determines that microhabitats required by a species are absent from the subject land (or specific vegetation zone). The assessor must include a description of the microhabitats assessed as being required by the species in the BAR. This must be based on evidence such as published literature.

BCS notes that the proposal site is within the predicted geographic range for the Striped legless lizard. There are no known geographical limitations for the species in the TBDC. The absence of species records cannot be used to justify the exclusion of candidate species from the requirement for targeted survey. If the Striped legless lizard cannot be removed from the list of candidate species credit species, assessors must proceed to BAM Step 4: Determining the presence of a candidate species credit.

Recommendation

- 7.1 Conduct a targeted survey to determine the presence or absence of the Striped legless lizard, obtain an expert report, or assume presence.

8. Justification for removal of Grey-headed flying-fox from the candidate species list is not adequate.

Table 2.3 Predicted Species Credit Species That Were Not Retained as Candidate Species for Survey in the BDAR includes the following reason for removing Grey-headed flying-fox from the candidate list for survey:

“There are no breeding camps within or nearby to the Development Footprint. The nearest known breeding camp is located in Mudgee, approximately 60 kilometres south of the Development Footprint (National Flying Fox Monitoring Viewer, DAWE 2021b). No further assessment is required.”

The ‘Species credit’ threatened bats and their habitats. NSW survey guide for the Biodiversity Assessment Method (OEH 2018¹) states:

“Potential breeding habitat: The initial search for camps should encompass any recorded camps and roosting habitat likely to occur on the subject land. If a camp is located the survey only needs to take place in the camp (that is the area occupied by the target species) to identify breeding females.”

¹ OEH (2018). ‘Species credit’ threatened bats and their habitats. NSW survey guide for the Biodiversity Assessment Method. Office of Environment and Heritage.

BCS was unable to locate details of any searches for Grey-headed flying-fox camps or roosting habitat in the BDAR. Evidence of this survey being undertaken is required to justify that there are no breeding camps at the site.

Recommendation

- 8.1 Provide evidence, via survey results, to support the assertion that there are no breeding camps for Grey-headed flying-fox at the site.

9. The targeted survey effort undertaken for threatened flora is inadequate.

Section 5.3(1) of the BAM states:

“The assessor must perform a targeted species survey for all candidate species credit species identified as likely to occur on the subject land.”

The Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method (DPIE 2020²) states:

“Survey effort must generally be high to ensure all areas of suitable habitat have been adequately surveyed and enable confidence in results (refer to Section 1.3 of this guide). Additionally, plants are sessile and for most species the probability of detection depends on the total time searched (in the appropriate season) rather than the number of site visits... The preferred approach recommended in this guide is the parallel field traverse.”

Table 1 in the Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method outlines the maximum distance between parallel field traverse (separation widths) as:

Lifeform	In open vegetation (m)	In dense vegetation (m)
Medium shrubs	20	10
Sub-shrubs	15	10
Orchid/ Epiphytes and climbers	10	5

Targeted surveys were undertaken for *Acacia ausfeldii*, *Commersonia procumbens*, *Prasophyllum petilum* and *Tylophora linearioides*. Table A1.2 Candidate Species-Credit Species of the BDAR provides:

“Targeted threatened flora walking transects were undertaken throughout the Development Footprint in August and October 2020 over eight days, for a total of 128 person hours of survey (refer to Figure 2.1 to Figure 2.5).”

Figures 2.2 to 2.5 Flora Survey Methods show the location of the Species Credit Species Transects from August and October 2020 relative to the Proposed Access Track Corridor.

Figures 3.1 to 3.4 Vegetation Communities show the location of each mapped Plant Community Type (PCT) relative to the Proposed Access Track Corridor.

BCS notes an absence of species credit species transects for some areas of the proposed infrastructure requiring targeted flora survey. This includes:

² DPIE (2020). Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method. Department of Planning, Industry and Environment.

- The eastern end of the proposed access track (PCT 281), and
- The western end of the proposed access track (PCT 479).

In Figure 2.3 there is an absence of species credit species transects in the east and west ends of the Proposed Access Track Corridor (mapped as PCT 281 and 479 respectively).

Targeted species surveys are required to survey all areas of potential habitat. Potential habitat is the area of the subject land that support any listed habitat constraints and PCTs associated with the target species as per the TBDC. Adequate flora survey effort requires undertaking parallel field traverses in accordance with the maximum distance for the species' lifeform, across all areas of potential habitat. Within the subject land, PCT 281 is required to be surveyed for *Acacia ausfeldii* and *Prasophyllum petilum*, whilst PCT 479 is required to be surveyed for *Commersonia procumbens* and *Tylophora linearis*.

Further evidence is required to demonstrate that the targeted survey undertaken for candidate flora species was adequate. Where limitations on the detection of species are still evident, further targeted survey, an expert report or assuming species presence will be required in accordance with Section 5.2.4 (2) of BAM.

Recommendation

- 9.1 Update the BDAR with additional evidence to demonstrate adequate survey effort or determine presence/absence using available alternatives.

10. The targeted survey effort undertaken for some threatened fauna is inadequate.

Section 5.3(1) of the BAM states:

“The assessor must perform a targeted species survey for all candidate species credit species identified as likely to occur on the subject land.”

Table A1.2 Candidate Species-Credit Species of the BDAR provides information on the threatened fauna surveys undertaken. Targeted species-specific surveys outlined include:

- Targeted nocturnal call playback and spotlighting surveys for Bush stone-curlew,
- Targeted breeding habitat tree searches and diurnal bird surveys for Gang-gang cockatoo and Little eagle,
- Targeted bird of prey nest searches and diurnal bird surveys were undertaken for Square-tailed kite,
- Targeted searches for hollows, call playback surveys (August 2020) and spotlighting surveys (October 2020) for Barking owl, Masked owl, and Powerful owl,
- Remote sensing cameras for Brush-tailed phascogale, and
- Spot Assessment Technique (SAT) and call playback surveys (October 2020) for Koala.

Figure 3.1 – 3.4 Vegetation Communities shows the location of each mapped PCT relative to the Proposed Infrastructure.

Figure 2.6 – 2.9 Fauna Credit Species Survey Methods shows the location of the surveys undertaken relative to the Proposed Infrastructure.

Targeted species surveys are required to survey all areas of potential habitat, being area(s) of the subject land that support any listed habitat constraints and PCTs associated with the target species as per the TBDC. BCS notes that for Figures 2.6 to 2.9:

- Bush stone-curlew: there is an absence of Spotlight Survey at the east end of the Proposed Access Track Corridor (mapped as PCT 281),
- Gang-gang cockatoo and Little eagle: the location of the Hollow-bearing Tree Assessments and the Diurnal Bird Surveys are outside of the Proposed Access Track Corridor (mapped as PCT 281),
- Square-tailed kite: the location of the Hollow-bearing Tree Assessments and the Diurnal Bird Surveys are outside of the Proposed Access Track Corridor (mapped as PCT 281) and the Proposed Infrastructure (Area 3) (mapped as PCT 618),
- Barking owl, Masked owl, and Powerful owl:
 - There is an absence of Hollow-bearing Tree Assessments, Call Playback and Spotlight Survey at the east end of the Proposed Access Track Corridor (mapped as PCT 281),
 - The location of the Hollow-bearing Tree Assessments and the Call Playback (August 2020) are outside of the Proposed Infrastructure,
- Koala: The location of the Koala SAT is outside of the Proposed Access Track Corridor.

Further evidence is required to demonstrate that the targeted survey undertaken for candidate fauna species was adequate. Where limitations on the detection of species are still considered to be present, further targeted survey, an expert report or assuming species presence will be required in accordance with Section 5.2.4 (2) of BAM.

Recommendation

10.1 Update the BDAR with additional evidence to demonstrate adequate survey effort or determine presence/absence using available alternatives.

11. Survey timing for some candidate-species credit species should be adequately justified.

Section 5.3(2)(a) of the BAM states, if undertaking a species survey the assessor must:

“Only survey during the time specified for that species in the TBDC, unless there is clear justification to vary the timing and the reasoning is documented in the BAR.”

Table 2.4 Candidate Species-Credit Species Survey Timing in the Development Footprint in the BDAR outlines the survey period as per TBDC:

- Gang-gang cockatoo – Oct to Jan,
- Square-tailed kite – Sep to Jan, and
- Powerful owl and Masked owl – May to Aug.

Table A1.2 Candidate Species-Credit Species identifies the survey methods for these species as including:

- Gang-gang cockatoo – Targeted breeding habitat tree searches were undertaken throughout the Development Footprint in August and October 2020,
- Square-tailed kite – Targeted bird of prey nest searches and diurnal bird surveys were undertaken throughout the Development Footprint in August and October 2020,
- Powerful owl and Masked owl – Targeted searches for hollows greater than 20 cm diameter and greater than 4 m above the ground were undertaken in August and October 2020 to

identify potential breeding habitat available for the species across the Development Footprint. Additional spotlighting surveys were undertaken in October 2020.

BCS notes that the candidate species credit species identified above were excluded from further assessment on the basis that these species were surveyed for and found to be absent from the subject site.

BCS identifies that the targeted survey for the above-mentioned species is partly undertaken outside of recommended survey months. Further discussion should be provided to justify that the targeted survey undertaken for the species above was adequate to determine the absence of these species from the subject site.

Recommendation

11.1 Provide further justification that that the targeted survey effort undertaken for candidate-species credit species surveyed partly outside a recommended survey month is adequate to determine the absence of these species from the subject site.

12. The targeted survey effort for Pink-tailed legless lizard is inadequate.

Section 5.3(1) of the BAM states:

“The assessor must perform a targeted species survey for all candidate species credit species identified as likely to occur on the subject land.”

Section 5.3(2)(b) of the BAM states, if undertaking a species survey the assessor must:

“comply with the Department’s threatened species survey guides published by the Secretary of the Department or anyone authorised by the Secretary.”

Table A1.2 Candidate Species-Credit Species in BDAR states:

“Targeted diurnal herpetofauna surveys were undertaken in October, with a focus on rocky habitats with native grassy ground cover. Locations of diurnal reptile searches are shown on Figure 2.6 to Figure 2.9 Observations for reptiles were also made opportunistically during other aspects of surveys, in particular while undertaking targeted threatened flora transects.”

Figures 3.1 to 3.4 Vegetation Communities shows the location of each mapped PCT relative to the Proposed Access Corridor.

Figures 2.7 and 2.8 Fauna Credit Species Survey Methods shows the location of the Diurnal Reptile Search relative to the Proposed Access Track Corridor and Proposed Infrastructure.

BCS notes that there is an absence of Diurnal Reptile Search at the Proposed Infrastructure (Area 3) in PCT 618. Additionally, the locations of the Diurnal Reptile Search are located outside of the Proposed Access Track Corridor.

Targeted species surveys are required to survey all areas of potential habitat, being area(s) of the subject land that support any listed habitat constraints and PCTs associated with the target species as per the TBDC. Surveys for the Pink-tailed legless lizard must include all areas within the Development Footprint that include the listed PCTs for that species (including PCT 281 and PCT 618).

Table 3.6 Predicted Species-Credit Species in the BDAR states:

“This species was not recorded despite targeted surveys within the Development Footprint in October (refer to Appendix A).”

The nearest record of this species on BioNet is approximately 50km to the east, near Mogo in Goulburn River National Park (DPE 2022c)."

Table 4.2 Targeted Fauna Survey Effort for EPBC Matters of National Environmental Significance (MNES) states:

"October 2020: 3x Diurnal reptile searches (30 minutes duration)."

The *Department of Planning and Environment's Threatened reptiles Biodiversity Assessment Method survey guide*³ provides the species-specific survey requirements for pink-tailed legless lizard:

Survey area: Per 50 ha of suitable habitat

<i>Survey method</i>	<i>Survey period</i>	<i>Effort per survey</i>	<i>Survey replicates</i>
<i>Habitat surveys</i>	<i>Sep. – Nov.</i>	<i>≥200 suitable rocks</i>	<i>4</i>

BCS notes that the targeted surveys for Pink-tailed legless lizard do not meet the species-specific survey requirements in the Threatened reptiles BAM survey guide.

Further evidence is required to demonstrate that the targeted survey undertaken for Pink-tailed legless lizard was adequate. Where limitations on the detection of species are still considered to be present, further targeted survey, an expert report or assuming species presence will be required in accordance with Section 5.2.4 (2) of BAM.

Recommendation

12.1 Provide further justification to support the adequacy of targeted field survey for Pink-tailed legless lizard species that were considered to have a low detection probability.

13 Species polygons for Large-eared pied bat and Eastern cave bat must be clarified and may need revision.

Section 5.2.5, Box 2 – Requirements for the species polygon in BAM outlines the requirements for species polygons stating that the species polygon must:

"use GPS to confirm the location of the species polygon on the best available orthorectified aerial image of the subject land."

Table 1 of the 'Species credit' threatened bats and their habitats provides the features and approach required to develop the species polygon for species credit bat species for Large-eared pied bat and Eastern cave bat. This states:

"Use high resolution aerial imagery and topographic maps to identify potential roost habitat features on the subject land when it is within 2km caves, scarps, cliffs etc.

Species polygon boundary should align with PCTs on the subject land to which the species is associated (listed in the TBDC) that are within 2km of identified potential roost habitat features."

Figure 3.12 Species Polygons in the BDAR shows the location of the Species Polygon for Large-eared pied bat and Eastern cave bat relative to the Proposed Access Track Corridor.

³ DPE (2022). *Department of Planning and Environment's Threatened reptiles Biodiversity Assessment Method survey guide*. Department of Planning and Environment.

BCS notes that the Species Polygons in Figure 3.12 occur outside of the Development Footprint. The species polygons should be refined to map PCT 281 that is within 2 kilometres of cliffs/ potential roost habitat, and which is within the Proposed Access Track Corridor.

Recommendation

13.1 Clarify or revise the species polygons for Large-eared pied bat and Eastern cave bat to align with BAM.

14 The species polygons for some species that have been assumed present within the 'maximum parameters' area require review

Table 6.4 of the BDAR describes how species polygons have been calculated for each of the species that have been assumed to be present. It is noted that in most cases the species polygons incorporate the entire areas of all associated PCT's for the species. BCS supports this approach.

BCS note that the species polygons for two species, Barking owl and *Commersonia procumbens* do not incorporate all potential habitat.

Barking owl

For the Barking owl Table 6.4 states *"until detailed surveys of the contingency areas are undertaken, it is unknown whether any nest trees are present. As such, for the purposes of the maximum parameters assessment, four 140m radius circles (one for PCT 281, one for PCT 478, one for PCT 481 and one for PCT 479 (Intact/thinned condition types only) are assumed (4 tree circles total). The outcomes of the broad assessment of hollow density within the infrastructure contingency footprints have guided these numbers"*.

BCS does not support this approach. Where surveys have not been conducted and the presence of or number of nest trees is unknown the species polygon must incorporate the entire area of potential habitat, in accordance with Section 5.2.5.4 of the BAM. In this case the entire area of PCT 281, PCT 478, PCT 479 and PCT 481 should be included in the species polygon.

BCS note that the same approach has also been applied to the species polygons for Gang-gang cockatoo, Powerful owl, and Masked owl, however in these cases the buffered area incorporates all potential habitat therefore the final polygon is adequate.

Commersonia procumbens

For *Commersonia procumbens* Table 6.4 states *"the species polygon covers all areas of three PCTs (478, 479 and 481) that could be impacted in the Maximum Parameters Area"*. BCS notes that the vegetation zone '481_Regen', which has an area of 0.4 hectares has not been included in the polygon. This vegetation should be included in the species polygon unless appropriate justification is provided for its exclusion.

Recommendation

14.1 Review species polygons for Barking owl and *Commersonia procumbens* to incorporate all potential habitat for the species.

15 Spatial layers for all species polygons in the 'maximum parameters' area have not been provided

Table 24 Minimum information requirements for the Biodiversity Development Assessment Report and the Biodiversity Certification Assessment Report – Stage 1: Biodiversity assessment in the BAM requires the following data to be provided:

“Digital shape files of each species polygon including GPS coordinates of located individuals

Species polygon map in jpeg format”

No spatial layers have been provided for the species polygons in the 'maximum parameters' area. BCS notes that a number a species have been assumed present in the 'maximum parameters' area and that the species polygons have been calculated using entire suitable vegetation zones. Although the species polygons have been derived directly from the vegetation mapping final species polygon spatial layers must be provided as part of the data package.

Recommendation

15.1 Provide spatial layers for each of the species' polygons.

Assessment of prescribed and indirect impacts associated with the construction and operation of the project require review

16. Address the expected impacts of subsidence on surface biodiversity values

Section 8.2 of BAM states:

“The BDAR or BCAR must include an assessment of the indirect impacts of the proposal on native vegetation, threatened entities and their habitat, and describe:

- a. the nature, extent, frequency, duration and timing of indirect impacts of the proposal:*
 - i. during construction*
 - ii. during operation*
 - iii. arising from a change in land-use patterns*
- b. the consequences of indirect impacts on biodiversity values*
- c. any limitations to data, assumptions and predictions about impacts on biodiversity.”*

Section 5.2.1.1 of the BDAR states:

“The subsidence impacts predicted for the Proposed Modification are not expected to result in any perceptible change in the condition or viability of any of these vegetation zones and are not expected to result in loss of vegetation in terms of direct tree failure or death. Subsidence is not expected to cause significant cracking or alteration to hydrology that could be reflected in impacts on vegetation.”

Section 5.1.1 in Appendix 7 in the Ulan Coal Modification 6 Underground Mining Extension Modification Report (Modification Report) states:

“The general surface landform is expected to be affected by impacts from vertical subsidence, tilt and strain, horizontal movements and the unconventional effects discussed in Section 4.1. Impacts are expected to be mainly in the form of cracking and humps

including compression overrides and ripples. Impacts are likely to be greater in magnitude in the areas of shallower depth and in the vicinity of steeper ground.”

Some examples of cracking from ‘Figure 11: Examples of impacts to general landform are presented’ in Appendix 7 of the Modification Report are provided below.



a) Cracking.



e) Wider crack near start line of longwall.

Section 5.1.3 in Appendix 7 of the Modification Report states:

“The potential for ponding in the main channel of Mona Creek is expected to increase at the northern edges of Longwalls W9-W11 as a result of proposed mining the in Proposed Modification extension areas of these panels.”

Appendix 7 in the Modification Report details a range of surface impacts that are to be anticipated as a result of the proposed modification. These impacts include vertical subsidence, tilt, strain and surface cracking, horizontal movements and unconventional subsidence.

It is widely acknowledged that mining-induced subsidence can cause impacts to the topography, hydrology and soil properties at the surface. Consideration must be given to the potential for water logging, erosion, modified soil, and groundwater hydrology that can result in soil chemical and physical changes. All potential impacts must be considered in combination under local conditions, including how these changes might impact biodiversity values which operate as part of an ecosystem in the development footprint.

The expected impacts of subsidence resulting from the proposal on surface biodiversity values including native vegetation, threatened entities and habitats have not been adequately outlined and addressed in the BDAR. Where there is uncertainty surrounding the impact of subsidence on the biodiversity values at the development site, the precautionary principal should be applied.

BCS is not in a position to provide advice on subsidence, aspects of hydrology/groundwater and interpret the niche and complex data associated with these reports in EIS submissions. . BCS recommend that Planning and Assessment engage an independent expert to provide advice.

Recommendation

16.1 NSW Planning engage an independent expert to provide advice on the impacts of subsidence on hydrology and groundwater.

16.2 The BDAR should address the potential for the proposed modification to result in impacts to biodiversity values caused by subsidence.

17. Prescribed impacts on habitat of threatened species or ecological communities associated with karst, caves, crevices, cliffs and other geological features of significance, rocks, human-made structures or non-native vegetation should be offset

Section 8.3.1 of BAM states:

“Assessment of the impacts of the proposal on threatened entities associated with karst, caves, crevices, cliffs, rocks and other geological features of significance must:

- a. predict the nature, extent and duration of short-term and long-term impacts*
- b. predict the consequences of impacts on the threatened entities identified in Subsection 6.1.1*
- c. justify predictions with appropriate modelling, relevant literature and other published sources (if available), or advice from experts.”*

Section 5.2.1.6 of the BDAR identifies the potential impacts from subsidence on cliff line habitat within the proposed modification area on Large-eared pied bat (*Chalinolobus dwyeri*), Large bent-winged bat (*Miniopterus orianae oceanensis*), and Eastern cave bat (*Vespadelus troughtoni*).

Table 5.5 Features of Geological Significance – Prescribed Impact Considerations in the BDAR states:

“Subsidence modelling indicates potential for some rockfall or cracking, however no significant collapse or otherwise of the cliff line habitats. Further detail is provided in Section 5.2.1.3. No maternity roosts have been identified in the Potential Indirect Impact Area, however potential habitat exists. The probability of any significant impact on any threatened microbat breeding or roosting caves within the Potential Indirect Impact Area is possible, however likely to be rare (Section 5.2.1.3).”

Section 5.2.1.6 of the BDAR states:

“There has been an instance of cave collapse in the UCC previously. In April 2020, complete collapse of a 41-metre wide section of sandstone cliff line was observed at monitoring site 811, above Ulan West Longwall 5. This was reported on in the 2020 subsidence monitoring report (Pacific Environmental, 2020). This is the largest, continuous rock fall observed to date at Ulan West. Pre-mining micro-bat monitoring surveys of longwall 5 (Hoye 2017b) did not detect a breeding roost of any cave-roosting micro-bats in the area of the rockfall. As such, the rockfall did not impact on a known breeding roost of any threatened micro-bats. No post rockfall monitoring or remediation has occurred.”

An excerpt from the 2019 annual bat monitoring report for UCML contained in the BDAR states:

“There were a number of declines in target microbat species activity at impact sites above the longwalls of Ulan West and Ulan Underground....Given the significant and sustained declines for these species across individual longwalls, further investigation such as that detailed in the Trigger Action Response Plan (TARP) detailed in the UCML Extraction Plan BMP will need to be enacted for longwalls UWLW2, UWLW3 and UWLW4 (UCML 2019)...The actual cause of the declines is not currently known and may be difficult to determine under the current monitoring program. Noted declines up to at least four years post-monitoring indicate that other processes may be causing a reduction in activity.”

BCS notes that cave collapse and declining detection of target microbat species have been observed at the existing development site. Mitigation measures proposed to address potential impacts from subsidence on cliff line habitat within the proposed modification on the above-mentioned microbat species are limited to monitoring. Consideration should be given to the

potential for further collapse of significant cliff habitats. The BDAR should also assess the impacts of the modification in further exacerbating the decline in target microbat species. Where there is uncertainty surrounding the impact of subsidence on the biodiversity values at the development site, the precautionary principal shall apply.

BCS notes that the impact cliff line habitat from subsidence of the proposed modification would represent a residual prescribed impact to the microbat species assumed present at the proposal site. This residual prescribed impact will require offsetting via biodiversity credits (outside of any credit requirements generated by BAM-C for direct impacts) and/or other listed conservation measures in accordance with Section 6.1.2(b) of the *Biodiversity Conservation Regulation 2017* (BC Regulation).

Section 7.14(4) of the BC Act requires the retirement of biodiversity credits prior to any development being carried out that would impact on biodiversity values. BCS does not support the approach of deferring the offsetting of residual prescribed impacts. In addition, adaptive management measures with targeted responses to address potential impacts should be implemented.

As there is no set methodology for the quantification of residual prescribed impacts, we recommend that the assessor consult with BCS to determine a method of credit quantification that will adequately offset the worst-case scenario impact resulting from the proposal. The assessor should clearly document the decision pathway and justification for suggested credit numbers or other compensatory actions.

Recommendation

- 17.1 The assessor must quantify credits to be offset for threatened species that will receive residual prescribed impacts resulting from the proposal, based on a maximum potential impact from the proposed modification, in consultation with BCS.
- 17.2 An adaptive management plan containing a trigger, action, response plan, should be developed that reduces and mitigates prescribed impacts on threatened bats.

18. Prescribed impacts on water bodies, water quality and hydrological processes must be adequately assessed.

Section 8.3.1 of BAM states:

“Assessment of the impacts of the proposal on water quality, water bodies and hydrological processes that sustain threatened entities must:

- a. describe the nature, extent and duration of short-term and long-term impacts*
- b. predict the consequences to the threatened entities identified in Subsection 6.1.4*
- c. where the proposed impact is in relation to longwall mining, calculate the maximum predicted offset liability as per the Addendum to NSW Biodiversity Offsets Policy for Major Projects: upland swamps impacted by longwall mining subsidence, using predictions of impacts on water-dependant plant communities and the threatened species they support*
- d. justify predictions of impacts with appropriate modelling (if available), relevant literature and other published sources of information, or consultation with species experts.”*

Section 5.3 of the BDAR states:

“Water quality, water bodies and hydrological processes are unlikely to be significantly impacted by the Proposed Modification.”

Section 5.1.3 of the in Appendix 7 of the Modification Report states:

“Watercourses in the Assessment Area are first, second, third and fourth order streams. Fourth order streams have not been mined under previously at UCC. These watercourses are all ephemeral in nature, only flowing during and immediately after heavy rain. Water is observed to pond in clay bottomed pools for a period after rain, but there are no known substantial, permanent, natural water holes within the Assessment Area.

Impacts from the proposed mining of the Proposed Modification extension areas are expected to include:

- *diversion of overland flow into sub-surface strata through cracks and lowering of the groundwater possibly causing potholes on flow lines*
- *changes to the length of time that ephemeral streams and pools located directly above longwall panels hold water after periods of heavy rain*
- *vertical subsidence causing ponding in the flatter areas where the stream gradients are low*
- *potential to locally change the course of flow lines in flatter areas*
- *nick-point erosion on stream channels where the gradient is locally steepened on the upstream side of longwall panels*
- *compression fracturing and upsidence where sandstone rock strata is exposed in the valley floor.”*

BCS notes that Appendix 7 of the Modification Report raises number of impacts to hydrology the proposal may result in including ponding in the main channel of Mona Creek, changes in groundwater behaviour above the Proposed Modification extension areas, and draw down of the regional groundwater level for several kilometres around each longwall panel.

BCS notes that the impacts to hydrology raised in Appendix 7 of the Modification Report are not outlined in the BDAR. Adequate assessment is not provided in the BDAR to outline the impacts of the proposal on water quality, water bodies and hydrological processes. Consideration should be given to which threatened entities may be impacted by these changes. Relevant evidence i.e., published literature is needed to support the predicted impacts. Where there is uncertainty surrounding the impact of subsidence on the biodiversity values at the development site, the precautionary principal shall apply.

The proponent should propose an offsetting method and quantum which is appropriate to the residual impacts expected to occur in consultation with BCS. In addition, a Trigger Action Response Plan (TARP) with adaptive management measures and targeted responses to address potential impacts that can be implemented to assist in accounting for the uncertainty of impacts is also required.

As outlined above, BCS is not in a position to provide advice on subsidence, aspects of hydrology/groundwater and interpret the niche and complex data associated with these reports in EIS submissions.

Recommendations

- 18.1 A full assessment of the extent of impacts, including predicted consequences to the threatened entities, resulting from impacts of the proposal on water bodies, water quality and hydrological processes should be conducted in accordance with BAM.
- 18.2 The assessor must quantify credits to be offset for threatened species that will receive residual prescribed impacts resulting from the proposal, based on a maximum potential impact from the proposed modification, in consultation with BCS.

- 18.3 An adaptive management plan containing a trigger, action, response plan, should be developed that reduces and mitigates prescribed impacts on water bodies, water quality, and hydrological processes.

Assessment of cumulative impacts requires review

19. Cumulative impacts are not adequately assessed.

Section 6.7.6.3 in the Modification Report states:

“The assessment of cumulative impacts or impacts within a regional context remains unchanged from the assessment completed for the UCCO Project. This assessment found the impacts of the overall UCCO Project would be relatively low within a regional context prior to, and very low after, the implementation of mitigation measures, including when considered in combination with other mining projects in the region such as Moolarben and Wilpinjong (Kuskie, 2009).”

Section 5.2.3 of the BDAR states:

“The Development Footprint is situated in a landscape that is characterised by agricultural land and mining land. The history of land clearing, agriculture and mining development has resulted in a low to moderate incremental loss of native woodland vegetation and fauna habitat surrounding the Development Footprint. The Proposed Modification will result in the direct loss of approximately 27.4 ha as a result of proposed surface infrastructure.

It is recognised that the Proposed Modification will result in removal of vegetation, and thus contributing to habitat loss and vegetation clearance in the locality. To address these impacts, mitigation measures are proposed including:

- maximising the use of existing disturbed areas within the Proposed Modification Area for the placement of infrastructure and to avoid impact on surrounding vegetation*
- implementation of a detailed pre-clearing and tree felling supervision program for proposed surface infrastructure areas. This will follow the existing procedures currently implemented by UCMPL under the current BMP*
- current weed management and feral fauna management activities (being completed as part of the BMP) will cover the areas subject to the Proposed Modification.”*

Under the cumulative impact assessment guidelines for state significant projects (DPE 2022), the proponent is to undertake a review of the project and other potentially relevant future projects that may be developed over the same time period or similar timeframes as the project.

The proposal should consider cumulative impacts of any other large-scale or similar developments proposed within the region. For example, the neighbouring Moolarben Coal Complex OC3 Extension Project proposes impacts to many of the same biodiversity values including the Large-eared pied bat and the Eastern cave bat, as well as Box-Gum Woodland. The cumulative impact on biodiversity values needs to be addressed.

Recommendation

- 19.1 An analysis of similar developments in the surrounding area (existing and proposed) should be included to provide a cumulative impact assessment for biodiversity values.

Avoidance and appropriate assessment of Serious and Irreversible impacts will require revision

20. The assessment of SAI for White Box – Yellow Box – Blakely's Red Gum Woodland CEEC requires revision.

To assist the decision maker to evaluate the nature of an impact to a potential entity at risk of SAI, the BDAR must contain specific details of the impacts in accordance with the assessment criteria set out in section 9.1 of BAM.

Section 3.2.4 Guidance to assist a decision-maker to determine a serious and irreversible impact (DPIE 2019) states:

“The assessment criteria in the BAM under Subsection 9.1.1.2.2 for TECs and 9.1.2 for species, are designed to estimate the impact the proposal will have on the viability of the entity at the local, Interim Biogeographic Regionalisation of Australia (IBRA) subregional/regional and state scales (see Appendix B).”

Table 5.6 Assessment of Potential SAI Entities for White Box – Yellow Box – Blakely's Red Gum Woodland CEEC states:

“Direct Impacts will result in disturbance to 9.5 ha of the CEEC, of which 3.0 ha is DNG condition and 6.5 ha is Intact condition. Potential Indirect impacts associated with subsidence are not predicted to result in any direct tree fall or any detectable change in the health or integrity of the Box Gum Woodland CEEC.”

Table 5.3 Summary of Vegetation Zones that Comprise the Box Gum Woodland CEEC identifies the total area under the maximum parameters assessment as a total of 24.1ha.

Section 5.1.1 in Appendix 7 in the Ulan Coal Modification 6 Underground Mining Extension Modification Report (Modification Report) states:

“The general surface landform is expected to be affected by impacts from vertical subsidence, tilt and strain, horizontal movements and the unconventional effects discussed in Section 4.1. Impacts are expected to be mainly in the form of cracking and humps including compression overrides and ripples. Impacts are likely to be greater in magnitude in the areas of shallower depth and in the vicinity of steeper ground.”

The proposal does not offer options which provide for avoidance of the Box Gum Woodland CEEC. Given the very large reduction in geographic distribution for this entity, avoidance of further reduction in geographic extent should be one of the highest priorities for demonstrating avoidance.

BCS notes that the SAI assessment detail for this entity has not been completed in accordance with BAM for the total area under the maximum parameters assessment. No data has been provided to estimate the impact the proposal will have on the viability of the entity at the local and IBRA subregional/regional scales, as is required by section 9.1.1 of the BAM. Detail on the anticipated impacts on subsidence on White Box – Yellow Box – Blakely's Red Gum Woodland CEEC have not been provided.

Further detail, as outlined above, is required to enable the decision-maker to decide if the proposal is likely to increase the extinction risk of any of the relevant entities and whether impacts/losses/declines are likely to be serious and irreversible.

Recommendations

20.1 Further information should be provided to justify why the development footprint cannot be redesigned to avoid the loss of White Box – Yellow Box – Blakely's Red Gum Woodland CEEC.

20.2 Revise the SAI assessment for White Box – Yellow Box – Blakely’s Red Gum Woodland CEEC to fully address section 9.1.1 of the BAM.

21. Present information for decision-maker to determine SAI for threatened species.

The approval authority is responsible for deciding whether an impact is serious and irreversible in accordance with clause 6.7 of the BC Regulation.

Table 5.8 Potential SAI Thresholds for Threatened Species in the BDAR identifies potential SAIs under the BC Act, and stating:

- *“Large-eared pied bat – SAI threshold is potential breeding habitat and presence of breeding individuals. Potential breeding habitat is PCTs associated with the species within 100 m of rocky areas containing caves, or overhangs or crevices, cliffs or escarpments, or old mines, tunnels, culverts, derelict concrete buildings. All breeding habitat on or within 100 m of the subject land and the area immediately surrounding the feature must be identified.*
- *Large bent-winged bat – Any impacts on breeding habitat could be considered a potential SAI. Potential breeding habitat is caves, tunnels, mines or other structures known or suspected to be used by the large bent-winged bat, including species records in BioNet with microhabitat code ‘IC-in cave’: observation type code ‘E nest-roost’; with numbers of individuals >500; or from the scientific literature.”*

These species are listed as candidate SAI entities under Principle 4 in accordance with Section 6.7 of the BC Regulation, meaning that:

“the impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.”

The TBDC profile for the large-eared pied bat states:

“Any impacts on breeding habitat used by this species could be considered potentially serious and irreversible.”

The TBDC profile for the large bent-winged bat states:

“Any impacts on breeding habitat could be considered potentially serious and irreversible.”

Both microbat species have previously been recorded in the locality. BCS notes that, as well as loss of breeding habitat, other impacts such as the direct loss of breeding individuals should be included in the assessment of impact significance.

Monitoring of microbat species has shown evidence of reductions in detecting species presence at the development site. Section 6.2.1.2 of the BDAR outlines that cliff line habitats, known to be important habitat for cave-roosting bats, occur in the proposed long wall areas (including confirmed nearby breeding roosts). Potential impacts on cliff lines that may occur following longwall mining include rock falls and perceptible cracking as well as cave collapse.

The impact of the proposal to micro-bat species, via the direct loss of breeding individuals caused by subsidence, has the potential to meet the criteria under SAI Principal 4. As such, BCS recommend that an SAI assessment is undertaken for both species in relation to SAI Principle 4. If there is an absence of available data or matters are uncertain the precautionary principle should be applied, a worst-case scenario assumed, and a maximum quantum of impact presented.

Recommendation

21.1 Undertake an SAI assessment for all relevant SAI potential entities, including the large-eared pied bat and large bent-wing bat, in accordance with section 9.1.2 of BAM.

Important aspects of the BAM-C cases require revision – errors will impact on the credit obligation

22. Inconsistencies in the use of plots for vegetation zones between BAM-C assessments

Section 4.2.1 of the BAM states:

“Using the information from Section 4.1, the assessor must perform a plot-based vegetation survey of the subject land to identify the most likely PCTs on the subject land.”

Section 4.3.4 of the BAM states:

“1. Table 3 shows the minimum number of plots that must be sampled by the assessor for each vegetation zone. Relevant attributes from the plot-based floristic vegetation survey data from Subsection 4.2.1, which was established to identify a PCT, may be used to meet the minimum number of plots that must be sampled for a vegetation zone.

2. If the broad condition state of the vegetation varies across the zone, additional plots may be needed to ensure a representative sample is taken for the vegetation zone.”

BCS notes that the same vegetation plot data has been entered into the BAM-C case for both the ‘development footprint’ area (child case 22259) and the ‘maximum parameters’ area (child case 30776), despite these BAM-C cases covering different areas at the site. The vegetation plot data entered into both BAM-C case has been separated into each vegetation zone. BCS accept this approach as the vegetation zones traverse both areas.

BCS note that a different number of plots have been entered in the BAM-C for the ‘development footprint’ versus the ‘maximum parameters’ for some vegetation zones. This has resulted in different vegetation integrity scores (VI scores) being calculated for the same vegetation zones ‘478_intact’, ‘479_intact’ and ‘481_intact’ across the two BAM-C cases (see table below).

Vegetation Zone	Plots used to inform ‘development footprint’	Plots used to inform ‘maximum parameters’
478_Intact	9, 16, 17	9, 16, 17, 26, 28
479_Intact	2, 5, 7, 15, 19, 22, 23	2, 5, 6, 7, 15, 19, 22, 23, 29
481_Intact	4, 10, 12, 21	4, 10, 12, 21, 27

BCS understand that this may have been done to meet the different minimum plot numbers required, as the vegetation zones in the ‘maximum parameters’ area are larger areas. However, all plots must be entered into both BAM-C cases. Even where minimum plot numbers have been met, if additional plots have been completed and they are representative of the relevant vegetation zone, this plot data must be entered into the BAM-C. All plot data entered into the ‘maximum parameters’ BAM-C case for each vegetation zone must also be entered into the equivalent vegetation zone in the ‘development footprint’ BAM-C case.

Recommendation

22.1 Ensure that all representative plot data collected for each vegetation zone at the subject site, is entered into all applicable BAM-C cases.

23. Area calculations for PCTs are inconsistent between the BDAR, BAM-C and spatial data

A review of the BDAR, BAM-C and spatial data has identified inconsistencies that the applicant and accredited assessor should be aware of. The area calculations for six PCTs (PCT 281, PCT 476, PCT 478, PCT 479, PCT 481 and PCT 618) in the 'maximum parameters' area are not consistent across all data sources. Whilst the area calculations across the BDAR and BAM-C are consistent, these calculations are inconsistent with the spatial data provided. The inconsistencies are detailed in the table below:

PCT	Area (ha) BDAR (Table 6.1)	Area (Ha) BAM-C	Area (Ha) Spatial Data
PCT 281	3.4	3.4	2.99
PCT 476	4.8	4.8	2.21
PCT 478	8.4	8.4	38.02
PCT 479	17.4	17.4	17.77
PCT 481	18.6	18.6	40.83
PCT 618	2.1	2.1	1.2

It should be noted that the above spatial areas have been calculated by BCS by clipping the vegetation mapping layers to the footprint boundary layers provided by the accredited assessor, as no final layer was provided as part of the data package. The assessor must ensure that all final layers for the BDAR figures and BAM-C are provided as part of the data package for verification.

Recommendation

23.1 Review the BDAR, BAM-C and spatial data to ensure that all data sources are consistent.

SMART principles must be applied when preparing post-consent management plans

24. Post-consent adaptive management plans must be prepared in accordance with SMART principals and contain quantifiable triggers for adaptive management.

Section 8.5(2) of BAM states:

“The proponent must develop an adaptive management plan to address any remaining impacts where mitigation measures in Section 8.4 have not been proposed in the BDAR or BCAR.”

Tables 3, 4 and 5 in the Stage 2 BAM Operational Manual provides examples of the types of information expected for a mitigation strategy to manage a residual impact. This information includes detail of the impact, the mitigation measure, the monitoring schedule, and the responsible person(s).

Section 4.2 of the BDAR outlines the construction and operation phase minimisation/mitigation measures to mitigate the unavoidable impacts of the Proposed Modification. The BDAR outlines that specific control measures are detailed in the Ulan Complex Biodiversity Management Plan. For example, to address disease management:

“There have been no known recordings of infestations of disease or fungus within the UCC. These diseases include Chytrid fungus, Myrtle Rust (Uredo rangelii) and Phytophthora (Phytophthora cinnamomic). The level of risk with regards to infestations of disease or fungus within the Proposed Modification Area or adjacent areas is considered low. An important measure to prevent the spread of plant disease such as Myrtle Rust is ensuring vehicles and equipment are clean of mud and vegetation before entering any areas off existing tracks into native vegetation.”

BCS notes that the detail provided in Section 4.2 of the BDAR does not establish a monitoring schedule or allocate responsibility for managing disease. BCS acknowledges that further information may be provided in the Ulan Complex Biodiversity Management Plan.

If consent is granted, BCS will provide detailed review and comment on relevant post-consent documentation for impact mitigation, including the Biodiversity Management Plan. BCS requires that strategies for residual and indirect impact mitigation adhere to SMART principles with quantifiable triggers for adaptive management in accordance with Section 2.6 of the BAM Operational Manual Stage 2.

Recommendation

- 24.1 Ensure post-consent adaptive management plans are prepared in accordance with SMART principals and contain quantifiable triggers for adaptive management.

Minor updates to the BDAR are required to ensure consistency with the BAM

25. The BDAR should be certified by the accredited assessor

Section 6.15(1) of the *Biodiversity Conservation Act 2016* (BC Act) states:

“A biodiversity assessment report cannot be submitted in connection with a relevant application unless the accredited person certifies in the report that the report has been prepared on the basis of the requirements of (and information provided under) the biodiversity assessment method as at a specified date and that date is within 14 days of the date the report is so submitted.”

The lead assessor for the project must certify in the Biodiversity Development Assessment Report (BDAR) that the report has been prepared on the basis of the requirements and information provided under the Biodiversity Assessment Method (BAM) as at a specified date, within 14 days of the date the report is submitted to the decision-maker.

The accredited assessor has not certified the BDAR i.e., by signing the first page. The BDAR must also provide an assessment of compliance with the minimum information requirements outlined in Appendix K of BAM.

Recommendations

- 25.1 The BDAR should be certified by the accredited assessor.
- 25.2 The BDAR should include an assessment of compliance with the minimum information requirements including Table 24 and 25 of BAM.

26. The mapping of the native vegetation extent requires revision

Section 3.1.2 of BAM states:

The assessor must prepare a Location Map based on digital aerial photography (such as ADS40 imagery) or the best available imagery, showing (at a recommended scale of 1:1000 or finer):

- a. the boundary of the subject land*
- b. the assessment area, which includes the subject land and a 1500 m buffer surrounding the outside edge of the boundary of the subject land or 500 m along each side of the centre line of a linear-shaped proposal. The assessor must establish the assessment area using GIS software*

- c. *landscape features identified in Subsection 3.1.3*
- d. *additional relevant detail, such as local government area boundaries or other base data relevant at this scale.*

Figure 1.5 – 1.10 show the Location Maps for the proposal site. Figure 1.8 – 1.10 show the location of the Native Vegetation relative to the Proposed Modification Area.

BCS notes that the Native Vegetation shown in Figure 1.9 does not appear to be buffered around the outside edge of the boundary of the subject land. A portion of the Proposed Modification Area in the east is not included.

The Location Maps should be updated to show the 1500m buffer surrounding the outside edge of the boundary of the subject land.

Recommendations

26.1 Revise mapping to comply with the requirements in the BAM.