Director, Mining and Industry Projects
Major Projects Assessment
Department of Planning and Infrastructure
GPO Box 39
Sydney, NSW 2011

Attention: Stephen O'Donoghue

2 May 2013

Dear Mr O'Donoghue

RE: Watermark Coal Project (SSD-4975) Publicly Exhibited Environmental Impact Statement

I refer to your letter received on 25 February 2013 seeking comment from the Office of Environment and Heritage on the exhibited Environmental Impact Statement for the Watermark Coal Project.

Details of the OEH response to the document are provided in Attachment A.

A response dealing with the Aboriginal cultural heritage issues will be forwarded separately.

In summary OEH has provided comments on the following matters with regard to biodiversity:

- The derived native grasslands component of endangered ecological communities may be under-estimated, and inadequate consideration has been given to the loss of endangered ecological communities and how the impacts from the Project will be offset in the short-medium term. OEH also does not support inclusion of mine site rehabilitation as an offset. In addition, it is unclear as to whether indirect impacts on the retained vegetation and fauna habitat have been effectively offset. As a result, OEH considers the biodiversity offset package to be inadequate.

- Whilst OEH supports multiple biodiversity outcomes for the onsite offset area, careful planning will be required to ensure that EEC restoration and Koala habitat creation can be successfully achieved.

- The assessment of the occurrence of groundwater dependent ecosystems within the Project site and potential impacts from the Project is inadequate.

- The Koala Plan of Management has focussed primarily on the loss of habitat. An inadequate description has been provided of the Koala population that occurs at the Project site and the potential impacts on the Koalas as a result of the Project. The proposed avoidance, mitigation and offset measures will not adequately ameliorate the impacts of the Project on Koalas. Finally, information should be provided to justify why the translocation of Koalas

should be accepted as a major mitigation measure rather than its intended use only in exceptional circumstances. A significant effort will be required to determine the fate of translocated koalas and the impact on koalas already resident at the translocation sites if translocation is trialled as a mitigation measure.

If you have any questions regarding this matter please contact myself on 02 6883 5317.

Yours sincerely,

ROBERT TAYLOR
Manager, Environment and Conservation Programs
REGIONAL OPERATIONS

Attachment A. Biodiversity.

Watermark Coal Project Public Exhibition
Office of Environment and Heritage Response

PROJECT OVERVIEW

The impacts of the Project on biodiversity values involve:

- The removal of 4,021 ha of native vegetation and habitat which includes:
    - 864 ha of woodland
    - 73 ha of derived native grassland
    - 3,084 ha of low diversity grassland, planted and exotic pasture (but see comments below)

- The removal of 789 ha of endangered ecological communities listed under the *Threatened Species Conservation Act 1995* including:
    - 738 ha of Box-Gum Woodland (including 73 ha of derived native grassland)
    - 30 ha of Inland Grey Box Grassy Woodland
    - 18 ha of Fuzzy Box Woodland
    - 3 ha of Weeping Myall Woodland

- One flora species listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*, Lobed Blue Grass (*Bothriochloa biloba*) has been recorded within the Project area.

- The removal of 847 ha of preferred Koala habitat.

GENERAL COMMENTS

- The comments in this response should be read in the context that it is based on the information within the environmental impact assessment, appended ecological assessment, desktop assessment and plot data provided by the consultant. OEH has not undertaken any on-site surveys to collect data.

- The following data were requested from the proponent so that a desktop verification process could be undertaken in regard to the classification of vegetation communities and derived native grassland EECs in particular:
    - copy of vegetation map (ArcGIS shapefiles);
    - location of vegetation plots (ArcGIS shapefiles); and
    - plot data including species lists and abundance rankings (MS-excel).

    The proponent supplied digital data for the following:
    - vegetation map for the offsite offsets and Project site;
    - location of the vegetation plots; and
    - BioBanking plot data.

The proponent did not supply species lists and abundance ranking of species recorded in each plot. Unfortunately it is this information that is crucial for the verification of vegetation classification and as such, **it was not possible to verify whether the vegetation community classifications in the EIA were correct**.

ACRONYMS USED WITHIN THIS DOCUMENT:

BAM – BioBanking Assessment Methodology

BOP – biodiversity offset package

BSAL – biophysical strategic agricultural land

C/EEC – critically endangered/endangered ecological community

DNG – derived native grassland

EIA – ecological impact assessment

EEC – endangered ecological community

GDE – groundwater dependent ecosystem

KPoM – Koala Plan of Management

LDG – low diversity grassland and exotic pasture

MIA – mine infrastructure area

BIODIVERSITY IMPACTS

1.   The vegetation condition mapping is inadequate, particularly in relation to grasslands.

Background

OEH notes that the proponent has used two different methods to assess vegetation/habitat condition. This is a confusing approach and in the experience of OEH neither of the methods appear to be widely used for the assessment of vegetation condition. The first method, based on field observations, vegetation type and edge to area ratio, is not referenced as being taken from peer reviewed published literature. The second method, the modification of the BioBanking score used by the proponent, is not a published peer reviewed methodology to provide a vegetation condition ranking.

As neither of the methods is widely used it is difficult for readers of this document to establish what the different categories mean on the ground. It is perplexing as to why the author would use the BioBanking method to collect the data, but not use the recognised method in this methodology for assessment of condition.

Using the proponent's methodology all grassland is assigned a "low condition" score. OEH does not agree with this conclusion given that neither the accepted BioBanking Assessment Methodology (BAM) condition methodology has been used and that plot data discussed in Section 2 of this response below for the "low diversity grassland and exotic pasture" (LDG) vegetation community indicates that many of the plots exhibit native plant species richness above benchmark levels. Thus the proponents own data provide clear evidence that the low condition score is not justified. The

extent to which this is the case cannot be determined but requires a complete re-examination of the condition mapping for grasslands.

OEH recommends that the proponent map all LDG into their condition state as per DECC (2009). This condition mapping would provide greater delineation of the current LDG vegetation community, ultimately allowing grassland to be identified as:

a. derived native grasslands that correspond to an EEC;

b. non-EEC listed native grasslands;

c. native vegetation in moderate-good condition; or

d. low condition vegetation/grasslands.

This condition mapping will assist the proponent in determining the locations within the offset areas that are the most suitable to target for restoration of ecological communities (see Section 4(b) in this response).

Recommendation

1. The "low diversity grassland and exotic pasture" vegetation community should be defined by its condition class as per DECC (2009). Suggested mapping types are:
    a. cleared land
    b. low condition
    c. >50% native ground cover with no native canopy present (derived native grasslands in moderate to good condition):
        i. grasslands that equate to EPBC Act and TSC Act definition.
        ii. grasslands that only equate to TSC Act definition
        iii. non-listed native grasslands
    d. >50% native ground cover with a native canopy present (native vegetation in moderate to good condition).

2. Any changes to the area of DNG EEC means that the offset calculations will need to be re-adjusted accordingly to ensure an adequate offset for the area of EEC to be removed.

2. Some areas of vegetation currently mapped as "Low diversity grassland, planted and exotic pasture" potentially should be re-mapped as derived native grassland - a component of the Box-Gum Woodland EEC listed under the *Threatened Species Conservation Act 1995.*

Background

Section 2.2.2 of the EIA lists the methodology used to identify Box-Gum Woodland EEC under the EPBC Act and the TSC Act. OEH notes that the proponent has acknowledged the different criteria that need to be applied when identifying these definitions of endangered and critically endangered ecological communities on the ground. However, it is somewhat puzzling that the areas of all listed EECs, particularly the Box-Gum Woodland, is exactly the same for the EPBC Act listing and the TSC Act listing - indicating that the different methodologies have not been applied.

OEH conducted a comparison of BioBanking plot data supplied by the proponent for the "Low diversity grassland and exotic pasture" (LDG) and the "derived native

grassland C/EEC" (DNG) vegetation communities (collected using BAM). This information suggests that vegetation currently mapped as "Low diversity grassland and exotic pasture" should be re-classified to derived native grassland (and therefore form a component of the Box-Gum Woodland EEC) under both the EPBC Act and the TSC Act due to:

- the species richness of native plants; and

- the ability of the grassland to achieve EEC status with assisted natural regeneration.

a.   Species richness of native plants

The BioBanking data indicates:

- Information collected from the 18 plots for the low diversity grassland derived from NA226 and NA237 communities that are identified as Box–Gum Woodland EEC indicates that average native plant species diversity recorded for all 18 plots in the LDG was higher (17.6 species) than the 4 plots of DNG (16 species).

- Four of the eighteen (22%) plots had a native plant species richness above benchmark levels for the vegetation types.

- Of the 18 plots in the LDG only 2 (11%) had an exotic plant cover greater than 50% (this measure includes exotic plants in the overstorey, midstorey and shrub cover as described in the BAM), indicating that all 16 plots recorded exotic groundcover values consistent with native vegetation in moderate to good condition as defined by the BAM.

b.   The grassland is capable of assisted natural regeneration

In Section 2.2.2 of the Ecological Assessment report of the EIA the proponent states that the identification of whether modified patches including grassland areas met the definition for EEC under the TSC Act was guided by the *Identification Guidelines for Endangered Ecological Communities: White Box, Yellow Box, Blakely's Red Gum Woodland (Box Gum Woodland) (NSW NPWS 2005)* and the proponent specifically highlights the section on whether either the understorey or overstorey or both have a '*natural regenerative ability*'. The proponent states that "Therefore, to be considered to meet the TSC Act definition of Box Gum Woodland, the grassland should be capable of assisted natural regeneration and not require active planting of trees and understorey."

The plot data recorded for the LDG shows that there are still very high numbers of native plants species present in the majority of plots with only two (11%) of the 18 plots recording exotic plant cover greater than 50%. Furthermore, as stated above 22% of plots had native plant species richness above benchmark levels and every plot indicated that the LDG vegetation zone had the maximum value for overstorey regeneration of species. With such high levels of species richness, native plant cover in the understorey in many of the plots and a full compliment of overstorey species regenerating across the LDG vegetation zone, it indicates that the majority of this zone would fit the description State 2 under the Box-Gum Grassy Woodland State and Transition Model (Rawlings *et al.* 2010) and therefore this community is more than capable of responding under appropriate management to assisted natural regeneration. The fact that the consultant reached a different conclusion when they had such data available raises serious concerns.

In conclusion, the data provided by the proponent does not support their results for the area on the Project site that has been identified as DNG EEC under the TSC Act. According to OEH analysis of the data, much greater areas of the LDG need to be re-evaluated and redefined as DNG EEC under the TSC Act. Furthermore, it is likely that some of the areas in the LDG may fit the definition of the CEEC under the EPBC Act given the high native species richness of some of the plots in the LDG.

Recommendation

The proponent re-evaluate the area of the Derived Native Grassland Box-Gum Woodland C/EEC and Weeping Myall Woodland EEC (if necessary) as defined by the TSC Act and EPBC Act.

3. Avoidance and mitigation measures described in the EIA should be formalised within any approval process.

Background

OEH evaluates proposals against the OEH policy of '*Principles for the use of biodiversity offsets in NSW'* (http://www.environment.nsw.gov.au/biocertification/offsets.htm)

The principles state that impacts from a development must be first avoided, mitigated, and finally offset. OEH notes that a number of measures have been proposed within the EIA to ameliorate the impacts of the Project on flora and fauna species and their habitats. Given that these measures have been undertaken to reduce the impact of the Project on biodiversity issues, OEH requests that some surety be provided within any Project approval conditions to ensure that these biodiversity values are not impacted by future mining operations. This would include:

- no disturbance of the Breeza State Forest;

- no disturbance of Mt Watermark and the adjacent Box-Gum Woodland EEC. The Mt Watermark Offset Area should have an appropriate in-perpetuity conservation covenant applied to the area as part of the BOP; and

- retention of EECs between the mining infrastructure area and the overburden emplacement area associated with the eastern mining area.

Furthermore, the following actions should be required of the proponent, as proposed within the EIA:

- monitoring of vegetation and threatened species and the establishment of reference sites as detailed in section 7.3 of the EIA;

- the development of a biodiversity management plan; and

- regular independent audits conducted on the BOP.

If these biodiversity values were impacted upon, or commitments to monitoring and the development of a biodiversity management plan were not upheld, the basis for this assessment of the impacts of the Project on biodiversity values would be compromised.

Recommendation

Biodiversity avoidance and mitigation measures as discussed above should be formalised within any project approval granted by the Department of Planning and Infrastructure.

4. Inadequate consideration has been given to the loss of endangered ecological communities and how the impacts will be ameliorated in the short to medium term.

Background

a. Substantial areas of EECs will be removed by the Project

Despite the avoidance and mitigation measures discussed in Section 3 above, OEH notes that the clearing of substantial areas of woodland (that is, 864 ha) has not been able to be avoided. Approximately 738 ha of Box-Gum Woodland EEC is proposed to be cleared as a result of the Project. When compared to the regional vegetation mapping for the Namoi catchment, this constitutes substantial clearing of already extensively cleared vegetation communities. The White Box grassy woodlands and Box-gum grassy woodlands mapped within the catchment have been reduced to 20% and 17% of their former extents (see http://www.namoi.cma.nsw.gov.au/416845.html?2). A further 51 ha of other EECs will be removed as a result of the Project. Removal of this vegetation also involves the loss of 847 ha of preferred Eucalypt-dominated woodland for Koalas. This clearing represents a substantial loss within an already fragmented regional landscape.

Whilst OEH accepts the conclusion that the avoidance, mitigation and offset measures are likely to ameliorate the impacts of the Project so that 'no threatened species are likely to become extinct' (Section 9 the EIA), the substantial short and medium-term impact on threatened species and ecological communities remains.

b. Revegetation of low condition disturbed land to EEC condition is questionable

Throughout the EIA there is an assertion that regeneration, revegetation, mine rehabilitation and offset activities will increase the final area of EECs and that these activities will offset the impact of the removal of existing woodland vegetation.

Table 8.5 in Section 8.7 of the EIA proposes to return mine rehabilitation areas to EEC condition – including 1,975 ha of Box-Gum Woodland and 82 ha to other EECs. OEH does not support land that is currently used for high value agricultural outcomes (and hence is of low condition in relation to biodiversity) to be rehabilitated for biodiversity outcomes, including the rehabilitation to EECs. It is also important to draw the proponent's attention to the fact that under the Interim Offsetting Policy (OEH 2011) OEH requires that the proponent justify why it is necessary to use rehabilitation and restoration as part of the offset package. There are a number of considerations in justifying why this type of land should be included in the proposal including:

- the proponent can demonstrate that they have exhausted all other options;

- that the rehabilitation/restoration is not already required by another approval body eg. mine rehabilitation requirements. If so this is considered double dipping;

- that the success of the rehabilitation/restoration is supported by relevant published/peer reviewed research;

The ability of the proponent to return cleared, mined land to the standard of the EEC being removed in the short or long term is highly questionable given the high probability of the introduction of weedy perennial grasses, changes to the water table and soil structure changes. Similarly, it is proposed that areas mapped as "low diversity grassland and exotic pasture" will be the areas targeted for revegetation for many vegetation communities within the BOP, including EECs, within the onsite and offsite offset areas (Table 8.5, Section 8.7). Other than very small scale projects there is little scientific evidence to support the proponent's view that large scale areas of Box-Gum Woodland EECs can be successfully revegetated on land that has a long history of cultivation or fertilizer application and a high exotic plant cover. In fact, the contrary is the case as there are many studies showing that it is very difficult to achieve. Other arguments against an approach using low condition land are:

- restoration is very expensive and given the evidence available the proponent is proposing a strategy with a high risk of failure; and

- this land is fertile land that should remain as productive agricultural land.

Unless the proponent can provide relevant published peer reviewed research to show otherwise, OEH would prefer that any revegetation activities are focussed on areas defined as State 1 or State 2 within the Box Gum Grassy Woodland State and Transition Model (Rawlings *et al.* 2010).

c. Offset ratios proposed for EECs are incorrect

As discussed in (b) above, the proponent's biodiversity offset proposal includes mine rehabilitation and the revegetation of EECs in vegetation currently mapped as "low diversity grassland and exotic pasture" at onsite offset areas and into "low diversity grassland" at offsite offset areas. Given the concerns raised in (b) above, OEH does not accept this proposal unless such areas are in fact DNG in moderate to good condition. Even with such land the majority of the offset should still be within existing woodland rather than just DNR.

Recommendation:

1. OEH does not consider it feasible that mine rehabilitation will result in the creation of EECs. Reference to mine rehabilitation for all biodiversity offset calculations should be removed and offset ratios should be re-calculated accordingly.

2. OEH prefers that EECs should firstly be offset by *existing* EEC woodland vegetation. If a proportion of DNG is included, only land defined as State 1 and State 2 within the Box Gum Grassy Woodland State and Transition Model should be targeted for revegetation activities.

3. Given recommendations 1 and 2 above, OEH recommends that the proponent undertake a complete review of the BOP relating to offsetting the impact of the Project on EECs.

5. The Biodiversity Offset Package is considered inadequate in a number of areas.

Background

a. *Native grassland may not be appropriately mapped as DNG EEC and therefore the proponent is offering a reduced offset ratio*

The assessment of grassland values and whether a particular area of grassland meets the definition of derived native grassland C/EEC under both the EPBC Act and the TSC Act has been discussed in Section 1 and 2 of this response. If additional areas of DNG EEC are identified, an agreed increase in the EEC area being offset should occur.

b. Use of mine rehabilitation areas as an offset for biodiversity loss is not acceptable

OEH will only consider areas subject to mine rehabilitation as a biodiversity offset as a last resort. The proponent would need to provide a comprehensive justification as detailed in Section 4(b) of this response. OEH also acknowledge that the majority of the land use at the Project site is currently agriculture-focussed and some of this is Biophysical Strategic Agricultural Land.

Therefore, the inclusion of mine rehabilitation in the biodiversity offset ratios is not accepted. Consequently, the offset ratio calculations are incorrect. See 4(b) and 4(c) above for further discussion on this issue.

3. Endangered ecological communities are not sufficiently offset

As outlined in Section 4 above, the proposed BOP includes the revegetation of "low diversity grassland and exotic pastures" into EECs listed under the TSC Act. As stated above OEH does not accept offsets into this vegetation community unless they form another essential ecological role such as connectivity. The current proposal is not accepted by OEH and therefore creates incorrect offset ratios for EECs. When only existing woodland and derived native grasslands are considered in the offset areas, the offset ratio is 1.8:1 for Box-Gum Woodland and less than 1:1 in total for the other EECs. OEH does not consider these offset ratios for EECs to be acceptable.

d. Insufficient offsetting of non-EEC native vegetation communities

Given the view of OEH as detailed in Section 5(b) above, OEH currently considers that two vegetation communities that will be cleared within the Project boundary - Tumbledown Red Gum Grassy Woodland and Blakely's Red Gum Shrubby Woodland - are not being offset as they rely on recreation within the mine rehabilitation area.

In addition, the regionally rare Poplar Box Woodland is offset only at 1:1. OEH does not consider that either of these situations is acceptable.

e. Different threatened species assemblages and vegetation types occur between the Project site and the offsite offset areas and there is potential for a large inaccuracy in the available areas and condition assessment for vegetation types in the offsite offsets

The offsite offset areas Aandra and Clonmeen are 100 kilometres north of the project site in the Nandewar Bioregion nestled in mountainous topography with the majority of vegetation types being consistent with high altitude vegetation types. In contrast the project site is located in the Brigalow Belt South Bioregion on the rich soils of the Liverpool Plains with vegetation types consistent with lowland vegetation types. It is not surprising then that there are significant differences in the flora and fauna assemblages between the two sites.

Examples of these differences are detailed below:

- Of the four flora species listed under the TSC Act that have the potential to occur at the Project site, only one has the potential to occur at the offsite offset site.

- 33 fauna species listed under the TSC Act are known to occur or have the potential to occur at the Project site.

    - Seven species recorded at the Project site have not been recorded at the offsite offset site, including the iconic Koala.

    - A further three species are not considered to occur at the offset site.

    - One species has been recorded at the offset site that has not been recorded at the Project site.

- Three vegetation communities in the onsite offset areas are not present in the project boundary - Brigalow, Blakely's Red Gum Motherumbah Shrubby Woodland, Dwyer's Red Gum Woodland.

- Six vegetation communities occur at the offsite offset areas that do not occur within the project boundary – Red Stringybark/ Blakely's Red Gum Woodland, Red Stringybark/ Rough-barked Apple Woodland, New England Blackbutt Woodland, Orange Gum Woodland, Manna Gum Riparian Woodland, River Oak Riparian Woodland.

- No indication is given as to how much time was spent on assessing the vegetation communities that occur within the offsite offset areas. According to the plot data sent to OEH by the proponent there were only 10 plots used to sample the vegetation over an area of 2,878 hectares and many vegetation types were not sampled at all. Consequently it is considered that the information presented in Table 8.4 of the EIA is likely to contain significant errors in regard to the areas quoted for the different vegetation types that have been recorded as occurring on the site. Furthermore, the range of vegetation types present on the site is likely to be incomplete and the condition of the vegetation, particularly the "derived native grassland C/EEC" and the "low diversity grassland, planted and exotic pasture" needs to be mapped according to those categories listed in Section 1 of this response.

f. Future management of the proposed biodiversity offsets remains unresolved

Section 8.6.6 of the EIA states that the proponent is considering voluntary conservation agreements, conservation covenants under Section 88 of the *Conveyancing Act,* rezoning and approval conditions. OEH recommends the following mechanisms and instruments to the proponent for securing offsets in the first instance:

- BioBanking Agreement and retiring of credits;

- Dedication to the public reserve system (where agreed to by OEH);

- Conservation Agreement;

- Trust Agreement; or

- Planning Agreement.

Please note that OEH does not support the securing of offsets via approval conditions only. The offsets must be secured in perpetuity.

It is noted that a parcel of Crown Land is located on Mt Watermark, and a portion of the area identified as Offset Area 6 remains within private ownership. OEH questions the ability of a third party (ie. the proponent) to secure an appropriate in-perpetuity conservation mechanism on these parcels of land.

Recommendation

OEH considers that the Biodiversity Offsets Package in its current form as detailed in Section 8.0 of the EIA is not acceptable and recommends the following:

1. A complete review of the proposed offset package for the reason listed from (a) to (e) above.

2. The future management of proposed offsets should be secured in accordance with the NSW OEH interim policy on assessing and offsetting biodiversity impacts of Part 3A, State Significant Development (SSD) and State Significant Infrastructure (SSI) projects.

6. The EIA does not demonstrate that indirect impacts on remaining vegetation and habitat have been effectively accounted for in either the assessment of significance or in calculating offsets.

Background

Section 6.3 of the EIA outlines possible indirect effects associated with the proposal including fragmentation, edge effects, dust, vehicle strike, noise, light and erosion. In an adequacy check of a previous version of the EIA OEH requested that the proponent adequately address the effect of indirect impacts on significant vegetation communities, threatened species and connectivity. These issues have not been addressed.

In Section 6.3 the proponent states that as a precautionary measure, the disturbance area incorporates buffers around the open cut mining areas, mining infrastructure areas and transport corridors. The majority of the disturbance area incorporates a 20 to 50 metre buffer around these areas and that inclusion of this buffer has allowed for assessment of some areas that may be indirectly impacted. The proponent goes on to state that impacts are considered in more detail in the remainder of Section 6.3 and have been considered within the assessment of significance (Appendix I of the EIA).

There are a number of issues with the above statements including:

• It is unclear how the 20 to 50 metre buffer was used to quantify indirect impacts. Was it added to the area of woodland and grassland being cleared and therefore contributes to any proposed offset?

• The comments made in regard to the various indirect impacts are very generalised and no attempt is made to provide quantification or analysis of different levels of impact for different species or species assemblages where relevant.

• In the assessment of significance there is little in the way of analysis of either direct or indirect impacts on the species assessed, even for the species that were found to be present on the site during surveys.

Recommendation

The proponent justify that they have adequately assessed indirect impacts on biodiversity and clarify exactly what is being provided to offset the indirect impacts.

7. Careful planning will be required to ensure that the proposed dual biodiversity outcomes for Offset Area 6 are achieved.

Background

It is noted that it is proposed that Offset Area 6 will have a dual role for biodiversity outcomes – to re-establish EECs (and other vegetation communities), and to provide habitat for Koalas. OEH supports multiple outcomes in biodiversity offsets however further information needs to be provided by the proponent:

1. A map indicating where the EECs to be revegetated will be located. Presently only the area (ha) has been provided in the EIA. This map should correspond to the condition mapping discussed in Section 1 of this response.

2. The proposed species composition of the Koala habitat plantings to be undertaken. Any plantings focussed on establishing Koala habitat need to be sympathetic to the TSC Act and EPBC Act EEC listings for the offset area to maintain this dual biodiversity outcome.

Recommendation

The following information should be provided for Offset Area 6:

1. A map indicating where each EEC will be restored.
2. The proposed species composition of the Koala habitat plantings.

8. The identification of Biophysical Strategic Agricultural Land (BSAL) within the onsite offset areas may alter the final biodiversity offset ratios.

Background

OEH acknowledges that 696 ha of BSAL has been mapped and site verified within the onsite offset areas. OEH also acknowledges that it may be determined that this land should remain available to agricultural activities and as a result it would be withdrawn from the proposed biodiversity offset package. We have recommended above that this also occur for reasons related to probability of failure of rehabilitation for biodiversity). Hence the biodiversity offset package needs to be appropriately amended to ensure that an acceptable offset for the EECs and other native vegetation communities that are being removed is achieved.

Recommendation

BSAL areas identified within the onsite offset areas should be excluded from the biodiversity offset package, additional biodiversity offsets secured to ensure an acceptable offset ratio is achieved.

9. The assessment of the occurrence of groundwater dependent ecosystems (GDEs) within the Project site, and potential impacts from the Project is inadequate.

Background

Section 3.2 of the EIA discusses the potential for the occurrence of GDEs within the Project site. The discussion implies that the only ecosystems to be considered within this impact assessment are those that are "totally" dependent ecosystems including some wetlands and karsts. OEH considers that any ecosystems may be considered groundwater dependent if it utilises groundwater from an aquifer – the degree of dependence is of less importance. The definition for GDEs contained within the Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2008 is "ecosystems which have their species composition and natural ecological processes wholly or partially determined by groundwater".

The assessment of GDEs is somewhat contradictory by stating that Table 3.3 of the EIA shows that no groundwater dependent communities exist at the Project site. Later it is stated that modelling conducted by SKM indicates 986 ha of very low potential, 485 ha of low potential, 839 ha of moderate potential and 58 ha of high potential groundwater dependency could occur at the Project site. OEH could not find a diagram within the EIS that displayed this information. Despite the potential for groundwater dependency to occur, Section 6.9 of the EIA states that no obvious GDEs occur at the Project site. OEH does not believe that the proponent has adequately justified these conclusions.

The Groundwater Impact Assessment (Appendix T) states that deep groundwater exists at the Project site and vegetation will not rely on groundwater in these areas. It is also stated that shallow groundwater exists, and if the salinity is too high the vegetation will not utilise the saline groundwater.

While OEH agrees with these statements in general, it is difficult to clearly understand where the shallow and deep groundwater occurs. An informed understanding of the potential interaction between groundwater and vegetation can only be gained if groundwater depth and vegetation communities are overlaid.

Recommendation

1. The proponent should provide additional information to justify:

    a. whether GDEs (as defined by the Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2008) are present or absent within the Project site; and

    b. if GDEs are considered to be present what the impact of the Project activities will be on them and how these impacts will be offset.

2. The proponent should provide information to support these conclusions, including:

    a. The SKM groundwater dependency mapping referred to in Section 3.2.2*iii* for the Project site; and

    b. an overlay of groundwater depth and vegetation communities.

ISSUES SPECIFIC TO THE KOALA-

Following a review of the KPoM, it is clear that the central focus of the document has been the issue of habitat loss. Whilst this is important and has been addressed satisfactorily, the Koala population on the Project site faces other substantial threats. Threats including traffic and train movements, dog attacks, disease, stress and

climate change can all significantly decrease the ability of the Koala population to survive in the long term.

A fundamental component of the environmental assessment requirements provided by OEH to the proponent has not been addressed for Koalas – namely that the EIA should address the likely impacts on threatened species, including an assessment of the effectiveness and reliability of measures to avoid, mitigate or compensate impacts on the species. While it is clear within the EIA that preferred Koala habitat will be cleared, detailed discussion about the impact of the Project's activities on the actual Koala population present at the Project site is absent.

Reference within the KPoM to the NSW Koala Recovery Plan (DECC 2008) and the National Koala Conservation and Management Strategy (DEWHA 2009) would have substantially strengthened the document and addressed many of the outstanding issues listed in this response.

OEH believes that inadequate information has been provided within the EIA and the Koala Plan of Management (KPoM) to assess the impacts of the Project on the Koala population, and whether the population will be improved or maintained over the life of the Project. OEH has previously requested that the proponent address this inadequacy in the EIS documents. Population studies that include radio-tracking, spotlighting and health surveys are required throughout the life of the mine to determine the status of the Koala population at the Project site.

Numerous statements exist within the KPoM that are unsubstantiated, misleading or incorrect. Section 10.1.1 states that there is "potential" for a significant impact on Koalas to occur if impacts from the Project are not mitigated. Regardless of the proposed mitigation and offset proposals made within the KPoM the Project **will** result in direct impacts to the Koala population at the Project site. Similarly Section 10.2 of the KPoM states that a range of indirect impacts "may occur" to the Koala population and/or their habitat. OEH suggests that indirect impacts **will** occur, particularly given that habitat fragmentation and habitat degradation are considered to be "indirect" impacts and the Project is proposing to clear 847 ha of preferred Koala habitat.

10. The description of the Koala population that occurs at the Project site is inadequate.

Background

An estimation of the Koala population that occurs on the Project site has been provided in Section 9.3.3. However, the proponent has not provided any details about the age structure of the population, the tree species that are being utilised or the general health (e.g. occurrence of Chlamydia) of the Koala population. Without these details it is difficult to determine what the impact of the Project will be on the Koala population, and the population's potential resilience to any impacts.

Recommendation

Specific details of the Koala population including population composition, utilisation of tree species and population health should be provided.

11. Inadequate identification of the impacts of the Project on the on-site Koala population.

Background

Whilst Section 7.4 of the KPoM summarises key threats to Koalas in general, the discussion of these threats/impacts in relation to the Project within Section 10 is totally inadequate.

a.   Impact on the Koala population is unknown

Although the proponent has identified numerous direct and indirect impacts of the Project on the Koala, the KPoM does not clearly state the potential magnitude of these impacts on the Koala population. Section 9.3.3 estimates a density of Koalas at the Project site to be 0.309 Koalas/ha of woodland, equating to a total of approximately 260 Koalas. The KPoM does not indicate the proportion of these animals that are likely to be impacted by the Project, nor which animals within the population are likely to be most affected by the mining activities. This lack of analysis makes it extremely difficult to determine if the potential impact is acceptable or if the mitigation measures are adequate. Given that all areas of koala habitat within the areas to be disturbed will be removed the impact will be total loss. Translocation and rehabilitation of areas to provide new habitat MAY provide some level of offset but this is yet to be determined. There is no discussion of the phasing of impacts to koalas over the life of the project and no information on the availability of new habitat in rehabilitated areas over time .

b.   Inadequate discussion of impact of road and rail movements

The KPoM acknowledges that an increase in vehicle movements will increase the level of risk to individual animals, and that this risk is accentuated given the likely reliance of Koalas on roadside vegetation for movement corridors. Section 7.16.3 of the Main Report indicates that vehicle movements along the mine access road could reach 196 at each of the AM and PM peak periods. During the operational phase of the mine these peaks could be 308 for each AM and PM period. Little discussion is provided on the number of vehicle movements that will occur within the Project site and the impact this may create.

Despite the admissions about increased traffic volumes, no attempt has been made to estimate the impact this may have on the Koala population, particularly breeding females, or how these impacts are proposed to be mitigated. Literature recommends that where roads traverse Koala habitat mitigation measures such as low speed limits, traffic calming devices, warning signage, wildlife underpasses, roadside lighting and/or exclusion fences should be utilised (DECC 2008; McApline *et al.* 2007). Low speed limits should also be enforced. OEH recommends that a speed limit of less than 60 km/h during daylight hours and 20-40km/h from dusk until dawn should be implemented at the Project site to attempt to reduce Koala injuries and mortalities.

The increased risk of injury or mortality from trains is also recognised. Given that up to 47 train movements per haul day will occur along the Werris Creek-Moree railway line OEH considers this to be a substantial risk to Koalas. Again, the proponent has not discussed the estimated impact this will have on the Koala population, nor have detailed mitigation measures been outlined.

c.   Inadequate discussion of indirect impacts – lighting, noise and dust

Impacts on Koalas from mining activities that involve lighting and noise have been poorly addressed and potential impacts have been understated. The statement in Section 10.2.6 that impacts from noise emissions are likely to be localised within

100m of the active pit is misleading and incorrect. The impact of artificial light at night on a largely nocturnal species like the Koala has not been discussed.

The potential impacts of dust (including coal dust), both on the direct health of Koalas and from ingestion through dust that has settled on Koala feed trees has not been discussed.

3. Inadequate assessment of significance for the Koala

The assessment of significance (Appendix I of the EIA) for the Koala is totally inadequate. No details of the actual Koala population to be impacted upon, nor what impact the Project will have on the population is provided. It is acknowledged that a recovery plan exists for the Koala but no discussion regarding the Project and the proposed mitigation and offset measures is provided. Key threatening processes are listed but no discussion is provided regarding the KTPs relevant to the Project. Finally, the conclusion provides no insight into the potential impact of the Project on the Koala.

Recommendation

1. A clear analysis of the estimated impact of the Project on the on-site Koala population should be provided including how these impacts are spread over the life of the mine.

2. A detailed analysis should be included of the amount of habitat that will be available over time due to the rehabilitation of new areas to koala habitat. This needs to be compared with loss of habitat over time and a strategy developed to cope with periods when loss does not equal creation of new habitat.

3. The proponent should provide a detailed discussion on the impact of increased road and rail movements on the Koala population and how these impacts will be mitigated. This should include the imposition of road speed limits of less than 60 km/h during daylight hours and 20 km/h from dusk until dawn.

4. The proponent should provide a discussion on the potential impacts of noise, light and dust on the Koala population and how these impacts will be mitigated.

5. The assessment of significance (Appendix I within the EIA) for Koalas should be expanded with particular attention paid to components (a), (d), (f), (g) and the conclusion.

12. The avoidance and mitigation measures outlined within the Koala Plan of Management do not adequately ameliorate the impact of the Project on Koalas.

Background

Section 11 of the KPoM acknowledges that the "Project has the potential to have a significant impact on the local population of the Koala". OEH does not believe that the proposed avoidance and mitigation measures are adequate to ameliorate the impacts on the Koala population.

a. Avoidance measures

It is stated that Breeza State Forest will not be disturbed and it represents an intact patch of vegetation that supports Koalas. However, Figure 9.2 in the KPoM shows high Koala activity along the northern and southern boundaries of the state forest but little activity within the state forest. Given that Breeza State Forest is listed as a major

avoidance measure a commitment should be provided that ensures that no future mining activities will occur within the state forest.

It is also stated that the Mine Infrastructure Area (MIA) has been strategically placed to avoid preferred Koala habitat. The woodland that has been avoided will be located between the MIA and the eastern overburden emplacement, subjecting the woodland to edge effects and subjecting any Koalas that may utilise the woodland patch to substantial threats. Details should be provided on how the Koalas that utilise this woodland will be managed and how impacts from the adjacent MIA will be mitigated.

No disturbance of the black soil plains is also listed as an avoidance measure to reduce the impact of the Project on Koalas. It appears that this area does not contain woodland habitat and therefore according to the EIA and KPoM it is not considered to be Koala habitat. It is unclear how this measure could therefore be considered an avoidance proposal for Koalas.

Despite these limited avoidance measures the Project will result in the clearing of 847 ha of Koala habitat, impacting on an estimated 260 Koalas. Areas of high Koala activity (Figure 9.2 in the KPoM) are located within all of the three Mining Areas (Eastern, Southern and Western) and adjacent to the proposed rail loop. In addition, neither the KPoM or EIA have attempted to explain the seemingly unusually high Koala activity within the Project site. Without an understanding of these causal factors, it is difficult to determine whether the mitigation and offset measures proposed are adequate to ameliorate the impacts of the Project. As these areas have not been avoided the current Project layout will result in a substantial impact to the Koala population.

b. Mitigation measures

It is acknowledged that mitigation measures have been included in the KPoM. However, given that OEH believes that the identification of the impacts of the Project on the Koala population is inadequate (see Sections 1 and 2 of this response), it follows that appropriate mitigation measures have not been sufficiently identified to ameliorate these impacts.

The measures proposed in Table 11.1 are general mitigation measures not targeted towards the Koala and therefore will provide limited mitigation to the impacts on the population. The measures proposed in Section 11.2.2 are unlikely to provide any substantial positive impact.

The EIA and the KPoM acknowledge that the Project may have a significant impact on the Koala. The incidence of sick and injured Koalas is likely to increase as a result of the Project. A major provision should be made within the mitigation proposal regarding how sick and injured Koalas will be provided for. Simply "contacting a local veterinarian" or "Koala/wildlife rescue organisation" is not sufficient as these resources are already stretched as they attempt to cope with the current level of sick and injured Koalas.

Recommendation

1. The proponent should provide assurance that Breeza State Forest will not be subject to future mining activities if it is to be used as an avoidance measure for Koalas.

2. The discussion of avoidance and mitigation measures within the KPoM should be updated following the amended identification of impacts on the Koala population (outlined in Sections 1 and 2 of this response).

   Given that OEH considers the current avoidance and mitigation measures to be inadequate the proponent should provide:

   a. Justification as to why the measures are adequate; or

   b. Provide additional measures to reduce the impact of the Project and therefore reduce the reliance on offset measures to ameliorate the impact.

   c. Indicate how the impacts will change over the life of the mine

3. Provisions should be made by the proponent to provide for sick and injured Koalas above that currently proposed within the KPoM.

13. The translocation of Koalas should be used in exceptional circumstances, not as a major mitigation measure.

Background

Section 11.2.10 of the KPoM acknowledges that the NSW Koala Recovery Plan states that translocation of Koalas should only be considered when animals are at extreme and immediate risk. The KPoM does state that Koalas will be "encouraged to move naturally" but there is no detail provided on how this might be achieved. It is therefore highly likely that the alternative option of translocation will be required. Given that an average of nine Koalas per year over a 30 year period are proposed to be translocated, this cannot be considered an exceptional circumstance.

Similarly, Table 5.2 states that limited data is available but successful translocation of Koalas have occurred in the past. In order to determine the ability of this measure to offset the impact of the Project, the proponent should provide evidence that translocation on the scale proposed is feasible and can be carried out in a manner that will not impact on any koala population present in areas where the koalas will be translocated to. .

If translocation remains the major mitigation measure, intensive population studies must be undertaken to determine the level of survival of translocated animals, and also to determine the impact on the resident population of Koalas within the translocation site. A comprehensive review of the success of the translocation program should be undertaken after an agreed time period (2-3 years) and appropriate alternative mitigation procedures should be adopted if the results are not favourable.

Recommendation

1. The proponent should provide justification as to why translocation of Koalas should be considered a standard offset practice for this Project given that the current Recovery Plan only permits translocation in exceptional circumstances.

2. If translocation of Koalas proceeds then it should be undertaken as a trial in the first instance. An intensive population study of the translocated Koalas and the resident Koalas within the translocation site should be undertaken. A comprehensive review of the translocation program should occur after 2-3 years to determine its success.

14. The proposed offsets within the KPoM do not adequately ameliorate the residual impacts of the Project on Koalas.

Background

a. Reliance on habitat restoration as an offset, including problems with lag periods

There is an underlying assumption within the EIA that the provision of additional Koala habitat (through regeneration, replanting, and the rehabilitation of the mining areas) will be adequate compensation for the impact of the Project's activities on Koala habitat. This is further supported by Section 11.3 of the KPoM which states that the avoidance and mitigation measures alone would be insufficient to ameliorate the impacts to the Koala population.

The extensive proposed enhancement of Koala habitat is discussed throughout the EIA and the KPoM. OEH is supportive of the proposal to increase the area of Koala habitat available through regeneration and replanting. The creation of the Mooki River Offset Area is also supported as this riverine habitat may provide drought refuge once established. Linkages between the Project site and the offset area should be investigated if they have not already.

Despite this, OEH believes the proponent has not adequately proven that the future establishment of Koala habitat will sufficiently offset the Project's impacts on Koalas. Cristescu *et al.* (2013) indicates that restoring flora on mine sites does not necessarily equate to the restoration of Koala populations. Whilst the restoration of 3,947 ha in Offset Area 6 is positive, the proponent has provided little justification as to how this will offset impacts from the Project to the Koalas in the short term.

In addition, a lag time of approximately 10–20 years will exist between the time of planting and the establishment of the vegetation to a point that it can offer appropriate habitat to Koalas. This is often conditional on the presence of mature trees within the revegetation sites to provide a greater diversity of habitat elements. Whilst in future years revegetation activities *may* provide adequate additional habitat, the first 10 years of mining operations may result in inadequate alternative Koala habitat (in offset areas and/or relocation sites).

Given this delay in habitat reconstruction, additional explanation is required from the proponent regarding how the 10-20 year delay will be accounted for in terms of habitat provision.

b. Suitability of translocation sites

It is noted that suitable release sites have been identified, particularly Offset Area 6, and the SAT plots indicate 'similar patterns of habitat use' in Offset Area 6 compared to the disturbance boundary (Section 9.3.1).

In addition, it is proposed that 'the number of Koalas will only be released into high quality Koala habitat that will be able to support a higher density of Koalas (Section 11.2.9*i*).

However, it appears that habitat mapping of the release sites will not occur until some time 'prior' to the translocation occurring. In order to make an informed assessment of the suitability of the release sites and their ability to support additional Koalas, information is required in the EIA or KPoM that clearly outlines the existing habitat features within the proposed relocation areas, the current carrying capacity (for Koalas) within these areas, and the ability of the relocation areas to support

additional Koalas in the immediate future, particularly given that it is estimated that 16 Koalas will be impacted in Year 0 (Table 10.1), prior to revegetation occurring.

Whilst a number of Koalas may be relocated to a particular site, it is essential to determine whether that additional number of Koalas permanently remains at the site, or whether there is a proportional loss of Koalas over time. It is also necessary to determine whether the translocated koalas impact on the resident population in the translocation site.

Section 11.2.10 indicates that Breeza State Forest may be investigated as an additional site for translocation. This site should only be considered if assurance is provided that future mining activities will not impact on the site and that the current population is below the carrying capacity.

It is noted in Section 11.3.1 that some properties within Offset Area 6 are yet to be acquired. This could impact on the area of habitat available for Koalas. If these properties are not acquired by the proponent this will impact on the habitat available for Koalas in the future and therefore the biodiversity offset package will need to be appropriately amended.

c. Considering existing Koala habitat and mine rehabilitation as an offset

Section S6 states that one proposed offset measure includes the "conservation and ongoing management of existing Koala habitat" within the onsite offset areas. OEH does not consider the management of existing areas to be an offset to the Project's impact.

The same section also indicates that mine site rehabilitation will restore 2,357 ha of preferred Koala habitat. This rehabilitation will be replacing habitat that currently exists (and is being removed for the Project). As stated in Section 4(b) of this response, OEH will only accept mine site rehabilitation as an offset following justification by the proponent that outlines why this is the only option that can be pursued.

Recommendation

1. Details should be provided on the impact on Koalas of the lag period between tree planting and adequate maturity of the vegetation in the offset areas. Details should also be provided regarding how this lag period will be addressed in terms of adequate provision of additional habitat in the intervening time period.

2. Additional details should be provided by the proponent relating to the proposed translocation sites including:

   a. the presence and suitability of the existing habitat elements to support Koalas, including primary and secondary feed trees. This should include mapping identifying the Koala habitat;

   b. an estimation of the current density of Koalas;

   c. an estimation of the carrying capacity of the translocation site; and

   d. proposed monitoring of the areas over time to determine the long-term number of Koalas each area supports, survival of translocated animals and any changes to movement patterns and survivorship of the resident population (i.e. those present before translocation occurred).

15. Inadequate identification of the impacts of the Project on Koalas in a regional context have been undertaken.

Background

Some information is provided on the distribution of Koalas from a regional perspective in Section 8.1 of the KPoM, however it lacks detail and there is no discussion regarding how the Project will impact on the regional Koala population. Sections 8.1.1 and 8.1.4 indicate that the Gunnedah Koala population may have experienced an estimated loss of 25% in 2009. This decrease in the population would suggest that the potential impacts from the Project may have greater significance to the remaining Koala population, but no discussion is undertaken.

The Project will not only impact on the individual Koalas that currently reside within the Project boundary but also on the Koalas within the broader region (ie. within 20 km of the Project boundary) that utilise the habitat resources and move through the landscape. A comparison is therefore required between the populations at the two scales. If the on-site Koala population has decreased is this mirrored in the regional population? If not, what might be the cause of the localised decrease? How can this information inform adaptive management? This comparison needs to occur over the life of the Project.

OEH notes that the Draft Gunnedah LGA Comprehensive Koala Plan of Management has been released for public exhibition. OEH has not yet reviewed the Comprehensive KPoM and additional comments may be forthcoming in light of a formal review.

Recommendation

1. Detailed information on the regional Koala population and the impacts of the Project on this population should be included in the EIA and KPoM.

2. The KPoM needs to commit to the establishment of a population study that compares the onsite Koala population characteristics and changes with the characteristics of the regional Koala population over the life of the Project.

References

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