



Office of Environment & Heritage

Your reference: SSD-5012
Our reference: DOC13/27049
Contact: Peter Ewin 03 5021 8915

Ms Caitlin Elliott
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NSW Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Re: Exhibition of Environmental Impact Statement for Atlas-Campaspe Mineral Sands Project (SSD-5012)

Dear Ms Elliot

Thank you for your electronic mail to the Office of Environment and Heritage (OEH), dated 6 June 2013 inviting us to make a submission on the publically exhibited Environmental Impact Statement (EIS) for the proposed Atlas-Campaspe Mineral Sands Project.

OEH has considered the EIS and our detailed comments are included as **Attachment A**. A number of these comments were raised in the OEH submission, dated 26 February 2013, to the Adequacy Review for this project. We note that a number of changes to the draft EIS have been incorporated based on these comments. However, we continue to believe that the proposal is likely to have impacts on the biodiversity values and Mungo National Park that have yet to be adequately addressed in the EIS.

In summary, OEH considers the issues that need to be addressed before we would support the proposal are:

- Lack of information within the EIS on vegetation condition, including mapping, making assessment of the impacts of the proposal on the vegetation present, and the associated threatened species, difficult.
- Adequacy of the proposed offset area in both area and configuration, particularly for Belah-Rosewood Woodland and associated threatened species.
- Development of comprehensive management and monitoring plans for a number of the threatened species that are to be impacted, including, but not limited to, Cobar Greenhood Orchid and Malleefowl.
- Lack of proposed mitigation action for an increased glow in the night sky at Mungo National Park, particularly during overcast weather conditions.

OEH recognises that there is no requirement to prepare a Statement of Commitments for an EIS for a State Significant Development as required previously for Part 3A Major Project Environmental Assessments. Section 7 of the EIS summarises the commitments presented in the EIS in regards to the project. OEH agrees with the broad statements in this Section, but we expect the inclusion of detailed conditions within the approval documentation, if issued, including a number of plans committing the proponent to ongoing management and monitoring that specifically address many of the concerns raised in this submission in regard to biodiversity, particularly threatened species.

Attachment A includes our detailed comments and a number of recommendations that we believe address these concerns. These recommendations may be used to assist the development of conditions of approval. OEH is happy to discuss these comments further with the Department of Planning and Infrastructure and the proponent.

If you have any further questions on these matters please contact Peter Ewin, A/Senior Team Leader, Planning on (03) 5021 8915 or by email at peter.ewin@environment.nsw.gov.au.

Yours sincerely



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13/7/2013

Encl: Attachment A – OEH Comments on and Recommendations for the Atlas-Campaspe Mineral Sands Project EIS

Attachment A: OEH Comments on and Recommendations for the Atlas-Campaspe Mineral Sands Project EIS

The comments below relate to both Main Report and the relevant Appendices of the EIS with references provided to the relevant document in the text. Recommendations are either for additional information to allow accurate assessment of the impacts of the proposed project or are provided to guide potential conditions of approval if the project application is successful.

Flora Assessment

Fire History

Section 2.7 of Appendix A (Page 17) provides a very brief summary of the fire history of the study area. The mapping developed by the Mallee Fire and Biodiversity Project (www.latrobe.edu.au/zoology/research/specialisations/fire-ecology/projects/mallee-fire-and-biodiversity) agrees with this summary, but more detail could be provided. The key points from this mapping are:

- Most of the study area burnt in the 1974-75 fire (mapped as 1972-77) including some (but not all) areas of vegetation mapped as non-mallee within the Study Area.
- Only small areas of mallee vegetation remained unburnt in this fire, within both the Atlas and Campaspe mine paths as well as in the proposed offset. These patches are generally less than 100 hectares in area, though Belah-Rosewood Woodland in the east between the two mine paths appears to be a large unburnt patch.
- There are three other relevant fires identified in the period 1977-2007 – a fire in 2000-02 located in the extreme north of the proposed offset, another in 1995-98 partly within the north western part of the Campaspe mine path, and another in 1992-95 located at the junction of the Campaspe MLA (but outside the mine path) and the proposed offset. These fires are relatively small in area (between 100 and 400 hectares) and it is unclear which of these fires is referred to in Section 2.7 (10-12 years earlier).
- Mapping ceased in 2007, and it is unlikely that a large fire has occurred since then but additional areas, similar in size to those described above, may have been burnt.

Fire is a key feature in mallee landscapes as it has an important role in determining habitat suitability for many threatened species (including Malleefowl) and also in the development of hollows (a key habitat feature) which begin to develop approximately 40 years post fire (see Haslem *et al.*, 2011). There are also techniques now available to age mallee vegetation based on stem measurements (Clarke *et al.*, 2010) and there would be significant value in including age within the assessment, particularly in areas containing threatened plant records.

Recommendation

*Utilise the mapping developed in the Mallee Fire and Biodiversity Project to provide an accurate fire history of the development site and offset, and if necessary, use the same methodology to map fires since 2007. Undertake additional survey using the methodology in Clarke *et al.* (2010) to estimate the age of areas mapped as having remained unburnt in the 1974-75 fire and confirm fire age for the areas within the proposed offset.*

Field Survey

The survey effort as described on Pages 20-28 of Appendix A within the development footprint is adequate in regards to both general survey and targeted threatened species surveys. However there appears to be a concentration in the Rapid Data Point surveys in an area to the south of the Atlas deposit (Wampo Station) with considerably less effort within the proposed offset.

Vegetation condition was not measured using the BioMetric methodology (though some of the information collected is similar – see Section 3.2.8). OEH in its original correspondence recommended the use of the BioBanking Assessment Methodology (BBAM) to assist with calculating the impacts and offset requirements. The collection of site data using the BioMetric

methodology (as required in the BBAM) would have allowed a quantitative measure of condition to be determined, which could be used for comparison against benchmarks to allow generation of a more accurate measure of condition. This could also be used to measure the outcomes of rehabilitation works within the mine footprint to determine success (or otherwise) of these works.

Another concern with the methodology used is the application of a general level of grazing to the study area (Page 27) which may be based on a false assumption. There is much literature on the impacts of artificial water points on grazing in arid and semi-arid rangelands (see Graz *et al.*, 2012). Figure 4.7 in the Main Report shows the existing water points within the study area, and there is likely to be a reduction in the grazing impacts by stock and feral goats (and to a lesser extent kangaroos) the greater the distance from these water points. The vegetation condition recorded may reflect this, though as condition is not presented spatially, this cannot be confirmed.

Recommendation

Establish a monitoring program within the offset and rehabilitation areas using the BioMetric methodology to measure condition (and hopefully improvement thereof) of the vegetation within these areas.

Desktop Review

The list of threatened species considered (Table 4 and Appendix D within Appendix A) is comprehensive with only the following two species not considered despite being recorded from the CMA Subregion on the Threatened Species website (www.environment.nsw.gov.au/threatenedSpeciesApp/):

- Button Immortelle (*Leptorhynchus waitzia*) – Low probability, recorded from Willandra Lakes World Heritage Area with no details.
- Silky Swainson-pea (*Swainsona sericea*) – High probability, there are a number of records (including specimens) recorded in Linear Dune Mallee to the north and west of the study site (see Clements *et al.*, 2000).

Vegetation Communities

The analysis of the vegetation data collected, the presentation of community profiles and the associated vegetation map are thorough and of high quality (Pages 46-72 of Appendix A). However, there are a number of concerns with the process and the resulting vegetation map detailed in Figure 11 (Figure 4-14 of the Main Report) that make it difficult to fully assess the impacts of the proposal:

- The decision to only survey (and map) the development footprint and the proposed offset limits the detail on the extent of the vegetation communities within the area and also the potential impacts of the clearing of this vegetation in a local context. The lack of mapping to the north of the Campaspe deposit and to the east of both deposits (particularly in the area surrounding the accommodation camp and connecting roads) is particularly important. Figure 8 gives an indication of the regional vegetation communities present, but this does not provide the level of detail required to fully assess the impacts of the proposed development.
- Vegetation mapping of the Southern Mallee Area (Val, 2001) detailed significant areas of the study area, particularly the northern extremity of the Campaspe mine path and the northern half of the proposed offset, as Deep Sand Mallee (which is identified a separate community from East West Dune Mallee in the NSWVCA (172)). Though both these communities are discussed in the EIS they are lumped together in the vegetation mapping. Further information on the extent of this community should be provided, as the assumption is that the two communities did not separate in the analysis due to lack of sites within the northern mallee areas, as there are implications for threatened fauna species which potentially have different usage of the these two communities.

- The Belah-Rosewood Woodland profile lists that NSWVCA 221 (Black Oak-Pearl Bluebush Woodland) may occur within the proposal. Given this community is poorly reserved, and has already had significant areas cleared by the proponent in the Ginkgo and Snapper Mineral Sands Projects, further identification of sites within both the development footprint and the proposed offset that correspond to this community would assist in assessing the likely impacts of the current proposal.
- It is assumed that it is position in the landscape that has led to the Saltbush Shrubland being allocated to Slender Glasswort low shrubland (NSWVCA 18) rather than Bladder Saltbush shrubland (NSWVCA 157) along the MCRT.
- The mapping of the vegetation at the Ivanhoe Rail facility is problematic as the Belah-Rosewood/*Acacia* Woodland is listed as being part of three NSWVCA communities (58, 221 and 77). The first of these are discussed above and it is considered unlikely that Black Oak-Pearl Bluebush occurs in this area. The final community (Yarran shrublands) is more problematic as it potentially meets the definition of the *Acacia melvillei* shrubland EEC even though *Acacia melvillei* is replaced by *A. homalophylla* in this location. The NSWVCA profile for both communities (23 and 77) contain the following quote (as also stated on Page 59 of Appendix B):

There is taxonomic confusion between the taxa Acacia melvillei and Acacia homalophylla. An assessment by Kodala (2001) shows that these closely related wattles overlap in their distribution but herbarium determination is difficult without seedpods as these vary between the species while other characters tend to overlap. These two taxa are lumped here into one community for semi-arid NSW and another community that occurs to the north in the Cobar Peneplain and in wheatbelt of NSW (ID77).

Therefore it would appear that the definition of the community is based on the presence of either of the *Acacia* species within specific IBRA regions. In this case the bioregion is the Murray-Darling Depression and hence is community is likely to be equivalent to NSWVCA 23. Whether this then meets the definition of the EEC as listed by the NSW Scientific Committee needs to be determined, though many of the associated species listed in this determination (including *Nelia*, Rosewood and Belah) are listed as occurring at the site. In either case it would be helpful to map (or at least describe) the extent of each of the vegetation communities listed above at the site.

Recommendations

Undertake vegetation mapping in the areas to the east of the proposed development footprint.

*Further discussion on the area and extent of some vegetation communities (particularly Deep Sand Mallee and Black Oak-Pearl Bluebush Woodland) needs to be added, as does further consideration (and mapping) of the Belah-Rosewood/*Acacia* Woodland present at the Ivanhoe facility.*

Vegetation Condition

Despite the limitations of the methodology (see above) the assessment of vegetation condition (Pages 72-77 of Appendix A) is probably to be as expected – most of the vegetation present (apart from communities occurring near water points, particularly Yarran Shrubland and Black Box Woodland) is in good condition (though this is not presented directly in Table 11). However, the assessment does not identify where the good condition vegetation occurs within the landscape and how much is to be cleared as part of the project. It is assumed that the most disturbed areas are associated with water points in the central portions of the clearing (and the adjoining proposed offset) and higher quality vegetation is associated with the mallee areas within the proposed offset. However it is unclear where the good condition Belah-Rosewood Woodland is located and as this community is generally highly degraded in south western NSW (particularly with the understorey grazed) then it is important to identify how much of this is located in the

clearing footprint and how much is within the offset. A site visit by OEH staff indicates at least some of the Belah-Rosewood Woodland in the eastern parts of the footprint, particularly of the Campaspe mine path is in good condition.

The vegetation condition assessment also does discuss time since fire (see above) and confirms (through lack of hollows) that much of the mallee vegetation was probably burnt during the 1974-75 wildfire. However, it appears no sites were undertaken within remnants that were not burnt in this fire and so it is unclear what hollow resource these remnants contain, if any. It also should be noted that much of the vegetation is approaching the time since fire when hollows would begin to develop in mallee vegetation (see Haslem *et al.*, 2011) and that based on past definitions this would be entering the age-class considered "old-growth", although the Mallee Fire and Biodiversity Project has thrown significant light on this and it is important that fire is excluded for significant parts of the offset area (see Management below).

Recommendation

A review of the condition assessment to identify the vegetation of different condition vegetation in each community is to be cleared and how much poor condition vegetation is to be included in the proposed offset.

Clearing of Native Vegetation

The clearing of 4158 hectares of native vegetation is likely to have significant impacts on the biodiversity of the area (Pages 78-83 of Appendix A and Table 4-46 of the Main Report). We understand that much of the footprint cannot be altered due to the location of the ore bodies and the associated infrastructure and agree that the use of the existing road network for the MCTR will minimise impacts on vegetation. The main concern we have is the location of the accommodation camp and associated access within Belah-Rosewood Woodland, the community with the greatest area cleared with the project (Page 83). Though it is difficult to assess the overall impact of the clearing in this part of the project (see comments above regarding extent and condition mapping) it is the community that we believe is being most significantly impacted by the overall project and poorly benefited from the current offset design. Although the alternative options for staffing the project are discussed on Page 6-14 of the Main Report (the decision to use an on-site workforce is agreed) there needs to be stronger justification for the location of the accommodation camp in this vegetation community, as locating it in another area may have significant benefits on the suitability of the final offset area.

Assessment of Significance

The species and communities considered in the assessment of significance (Pages 94-95 and Appendix L in Appendix A) are correct and we agree with the outcomes of this assessment (i.e. significant impact on *Pterostylis cobarensis* and *Acacia melvillei* woodland, no significant impact to other threatened species and communities). The discussion above in regard to the *Acacia* woodland present at the Ivanhoe facility may mean that this assessment needs to consider the vegetation present at that site.

In regard to *Pterostylis cobarensis* it is stated on Page 93 the design of stockpiles has been modified to exclude these plants from the stockpiles, though this appears to be on Figures 14 and 15 as a small exclusion area surrounded by infrastructure, meaning a high a chance of accidental or indirect damage to these plants. We agree that this is an important action and would suggest that this be clearly identified in the approval conditions and within the management plan discussed in greater detail below.

Recommendation

The requirement to effectively protect the population of orchids within the MLA area needs to be included as a specific approval condition (or as part of Management Plan). Further detail on how the proposed design and ongoing monitoring will demonstrate that the orchids

present at Site 4 have not be impacted upon by the project will need to be considered in this plan

Proposed ARC Linkage Project for Sandhill Pine Woodland

Within the Main Report (Page 4-48) there is discussion of in-kind involvement with the University of Ballarat in a proposed ARC Linkage Project investigating native pine regeneration. While OEH is aware of this project, it does not have full detail on the proposal, including likelihood of achieving funding and the proposed priorities and outcomes. We would like to see additional information, including a formal commitment by the proponent to the project if it does achieve funding and, given that small areas of Sandhill Pine Woodland EEC are being cleared as part of the project, a commitment to implementing relevant recommendations (if any) from the research project that will potentially mitigate the impacts of this clearing. As the proposed offset does not contain areas of this community, it would be likely that this commitment would need to be in a location currently not being protected from threats such as stock and rabbit grazing.

Measures to avoid and mitigate impacts on Flora

OEH accepts that the various management issues associated with biodiversity (outside the management of the offset) are incorporated into a single Biodiversity Management Plan (BMP) as identified on Page 97 of Appendix A. Some of the issues discussed below are based on experiences garnered from similar plans developed in as part of approvals for the Ginkgo and Snapper Mineral Sands Projects.

We agree with the proposed vegetation clearance procedures (Page 98 of Appendix A) on the basis that it is made very clear to the proponent that clearing is only allowed during specific seasons – see detailed comments under Fauna Assessment.

All actions detailed on Pages 99-100 of Appendix A would need to be included in the BMP. We agree with proposed mitigation for *Brachyscome papillosa* though a monitoring program would also need to be included (to ensure population isn't being impacted). Additional requirements for *Lepidium monoplacoides* would be the use of exclusion fences to exclude goats and rabbits from known populations and annual monitoring of known sites (and survey of other areas within the offset) to establish population size and changes. Given the location of the known populations of *Pterostylis cobarensis* the greatest threat is accidental destruction (including through fence/firetrail construction given proximity to boundary). The populations need fencing and signage as a priority and a contingency process detailed in case of accidental disturbance. Additional survey is also required in the offset to identify potential populations (see comments below).

We have major concerns about the likely success of the alterations to surface water flow and Black Box Woodland as described on Page 102 of Appendix A. We consider that a condition of approval is required to ensure that once rehabilitation activity is complete a hydrogeological evaluation of the area in question is undertaken following a period of suitable rainfall conditions and that any required additional repairs, are then implemented to ensure the desired outcome (i.e. water filling natural drainage basins) is achieved.

Detailed comments on the post-mine rehabilitation and revegetation (Pages 104-105 of Appendix A) are provided in Rehabilitation Strategy below, though we emphasise that we believe that there is a low likelihood of rehabilitation to conditions similar to pre-clearing vegetation (particularly in Belah-Rosewood and Mallee Woodlands), especially if the final land-use is conversion back to grazing.

Recommendations

OEH considers that it is necessary as a condition of approval that the Biodiversity Management Plan be submitted to (or developed in conjunction with) OEH for finalisation before commencement of clearing.

OEH recommends that a condition of approval be included to ensure that once rehabilitation is complete a hydrogeological evaluation of the area associated with Black Box Woodland is undertaken following suitable rainfall conditions and additional repairs implemented as required to ensure the desired outcome (i.e. water filling natural drainage basins) is achieved

Offset Strategy

We have a number of concerns regarding the proposed offset as identified in Pages 107-120 of Appendix A. We do not believe the area identified is sufficient to mitigate the impacts of the proposed development, though this is difficult to quantify as the proponents have not utilised an assessment methodology (such as the BBAM as recommended in our correspondence) that allows a quantitative evaluation of the biodiversity values of the offset. The main concerns are location, area and vegetation composition, though the issues raised above in regard to the assessment undertaken (i.e. extent of vegetation mapping and condition identification) also make it difficult to assess the appropriateness of the proposed offset.

While a number of the criteria identified on Page 107 of Appendix A in regard to selection of the offset are valid, including proximity to both the mine site and existing conservation reserves, and the location of existing tracks and fencelines, other selection criteria identified are less so. Particularly, there is no requirement that limits the offset to '*Cristal Mining controlled land*'. The entire area within the Boree Plains Station has not been mapped or considered as the offset, indicating that the location of offset land is restricted to areas that do not contain further potential mineral resources (a consideration which has not been included in the EIS). While any proposed offset must be able to be managed for that purpose in the long term, we also do not believe mineral prospect within the area of this proposal should limit the area of the offset, if sufficient 'sterile' areas are not available.

The key issue with the location of the proposed offset is the 'tongue' of vegetation between the two mine paths, approximately 11 kilometres along the northern boundary adjoining the Campaspe deposit and 10 along the southern Atlas boundary. This will increase significantly the edge effects related to the disturbance with the mine workings (dust, noise, weed and feral species invasion) to the offset area and may be a significant impediment to the proposed protection in perpetuity mechanism. However, we also acknowledge if this area is excluded then many of the vegetation communities to be impacted by the proposal will not be protected in the remaining western portions of the proposed offset and an additional area would need to be identified.

We do not believe the area within the offset is sufficient to mitigate the impacts on biodiversity, particularly in regard to Belah-Rosewood Woodland. As this community occurs on heavier soils, it was one of the most targeted for clearing under the Southern Mallee process and many areas are also highly degraded with the understorey being particularly impacted by grazing. While the condition assessment is unclear of the location of good condition woodland, it does state that about 75% of the study area is in this category. Given that the area within the offset is only slight larger than the area cleared (1.3:1) we do not believe that this sufficiently mitigates the impact. It may be possible to reduce the clearing area (such as relocation of the accommodation camp), but there is still a requirement, we believe, to increase the area of Belah-Rosewood Woodland within the final offset.

A number of communities, particularly associated with roadworks, are also not included in the offset area and though the areas in terms of the overall project are small (around two percent)

they are of sufficient area (90 hectares) to require offset if they were identified as a separate project.

We do agree that the area proposed is sufficient for the mallee communities that are particularly important for many of the threatened fauna species impacted by the project, but would also note that these communities (particularly Linear Dune Mallee) have some of the highest reservation rates within the region due to their poor carrying capacity for grazing and unsuitability for cropping.

Based on the evidence provided, OEH does not agree that there is 12765 hectares of suitable habitat within the offset for *Pterostylis cobarensis* (Page 110 of Appendix A). 240 survey sites (Table 11) were undertaken in the two listed communities (Sandplain and Linear Dune Mallee) and this species was only recorded at two of these (Table 6). Currently there is no summary detailing the number of sites within these communities within the proposed offset (or additional surveys undertaken in October 2012) but it would appear that there may be other localised factors (rather than just vegetation community) determining the distribution within the area. Initially it was thought there may have been a link to long unburnt vegetation (based on the Mallee Fire and Biodiversity Project) but this does not appear to be the case, so there may be some other factor, such as localised drainage, limiting its distribution. Given the distance (greater than 150 kilometres) from the nearest known population despite significant past vegetation survey in the region, until this factor is identified or more populations are identified from survey in the offset area, it may be prudent to consider the known locations as the only ones in the local area.

Stating these concerns about the proposed offset, the following comments are related to the management of this area but could also be applied to any additional areas that may be potentially added to the offset. We support the proposed methods for protection in perpetuity, but previous discussions with the proponent have indicated that the timeframe for achieving some of the outcomes, particularly addition to Mungo National Park, may take longer than a year and that initial stages should be undertaken as early as possible. Also, as stated above, the design of proposed offset with long edge-effects may reduce the suitability of this area for the proposed protection methods. Careful consideration should be placed in the approval to ensure a protection method is obtained in the long-term but timeframes are sufficient to ensure delays to the project are not caused by lack of success.

Once the offset is agreed, however, the Management Plan needs to be developed immediately and ideally before clearing has commenced. Expanding on the points presented in Appendix A, the following should also be considered in the Offset Management Plan:

- Complete closure of water points (rather than fencing) to reduce water sources for feral animals;
- Adjustment in feral animal control methodologies dependant on the outcomes of monitoring efforts – may need to be initially concentrated in the most disturbed areas to assist natural regeneration;
- Prioritisation of weed management should be those required under legislation (such as noxious weeds) and those with significant biodiversity impacts (such as Ward's Weed);
- The regeneration of the cleared and highly disturbed areas need to be monitored to ensure targets are being met and so decisions can be made to determine when additional active management is required; and
- The approach to fire appears practical with suppression of wildfire (particularly lightning strike) to prevent a broad scale event within the offset being the highest priority. Consultation with OEH (Mungo NP) and RFS to incorporate fire management at a regional level is encouraged, regardless of the final tenure of the offset.

Recommendations

The method for conservation in perpetuity needs to be identified early, preferably in the conditions of approval, and sufficient time needs to be allocated to achieve this outcome.

OEH would consider that it be necessary as a condition of approval that the Offset Management Plan be submitted to (or developed in conjunction with) OEH for finalisation before commencement of clearing.

Fauna Assessment

Methods

The survey methodologies and effort within the mine footprint and proposed offset as detailed in Pages 19-38 in Appendix B, appear to be adequate to assess the impacts of the project, other than the same comments as for the flora assessment in regard to surveys to the north and east of the project. It is also noted that no sites were located in the area identified as the preferred accommodation camp site, which appears to be in a large area of intact Belah-Rosewood Woodland. The survey effort for the MCRT may be low, but as linear infrastructure is difficult to assess and the route is adjoining an existing road for most of the extent, the methods used are considered adequate.

There appears to be details lacking on the survey associated with the Ivanhoe Rail facility. It is unclear when these surveys were undertaken (Table 2), why no sites were established in the development footprint (outside the access road) and why certain techniques (including pitfall trapping and bat survey) were not undertaken despite predicted threatened species only being detected using these techniques. Additional survey may be required to determine the full range of species present at the Ivanhoe Rail facility. Finally, there appears to be no documentation of the effort spent on identifying potential raptor nest sites across the study area, and this has impacts on threatened raptors, particularly Spotted Harrier and Little Eagle (see comments below).

The list of threatened species considered (Table 8 and Appendix B) is comprehensive with only the following three species not considered despite being recorded from the CMA Subregion on the Threatened Species website (www.environment.nsw.gov.au/threatenedSpeciesApp/):

- Yellow-tailed Plain Slider (*Lerista xanthurus*) – there are a number of records of this species in mallee near Mallee Cliffs National Park to the south west of the proposal.
- Plains-wanderer (*Pedionomus torquatus*) – this species has historically been recorded in the Ivanhoe area, and there is a low probability that it may occur in grassland areas within the project footprint.
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) – Possibly in the vicinity of Ivanhoe, but likely to be very edge of range (see below).

There are also a number of species listed in Table 16 which were considered as potentially impacted by the Ivanhoe Rail Facility (including Flock Bronzewing, Painted Honeyeater, Grey-crowned Babbler, Diamond Firetail and Kultarr) that have not been included in Table 8. There are a number of other species present in the CMA Subregion (Lachlan – Darling Depression (Part B)) that have not been considered as part of the Assessment of Significance, but OEH agrees that these need not be considered (see www.environment.nsw.gov.au/threatenedSpeciesApp/cmaSearchResults.aspx?SubCmaId=857).

Results

The results as detailed in Pages 39-98 of Appendix B provide a comprehensive report on the species recorded and the habitats present within the study area. The addition of information on raptor nests recorded during the surveys is noted. In particular, Section 4.4.13 (Resources for threatened species) provides a comprehensive discussion of the resources available to threatened species within the study area. However, it is unclear whether this data was collected from the fauna survey sites or from data compiled as part of the vegetation assessment. Also, there is no discussion on the differences (if any) between the habitat resources available within the development footprint and the proposed offset (and possibly even within Mungo National Park if data was collected at sites undertaken there). Clarification of the data collation process and some analysis within the different parts of the study area may provide useful information on the potential impacts of the proposal on these resources.

Assessment of Significance

OEH agrees with the list of species considered and the outcomes of the Assessment of Significance (Pages 117-120 and Appendix C in Appendix B), although there are a number of species that we believe need further consideration. However, the text on Page 4-63 of the Main Report appears to be contradictory when it states that *'the Project would be unlikely to significantly impact on any threatened species of fauna, with the possible exception of the following species which were considered to have the potential to be significantly impacted in the short-term'* whereas the Assessment of Significance states (and we agree) that the impacts on these species will be significant. We believe it is likely that the impacts are likely to occur in the medium to long term, depending on the ongoing management of the proposed offset and success of the rehabilitation within the mine footprint.

Given the paucity of Bardick records in NSW, two records within a single survey means that this area may be a significant population for the state, and although none were captured within the development footprint, there is a high likelihood of their occurrence, particularly in the north west portions of the Campapsee deposit. The locations where the species was recorded are mapped in Val (2001) as Deep Sand Mallee and the area of habitat within the proposed offset may not be as high as described, though the area to be cleared is also proportionally less as well.

We agree that the impact on Malleefowl of the project is likely to be significant, with at least two breeding pairs directly impacted by clearing of vegetation. Both these mounds appear to be close to the boundary of the development footprint and although it appears to have been a modification of the development footprint to avoid these mounds, we believe it is likely that indirect impacts (either disturbance by noise and vehicle movements or loss of foraging habitat) would prevent the birds utilising these mounds. Additional survey in the vicinity of these two mounds should be undertaken within adjoining uncleared area to identify other mounds that the birds may utilise, and ongoing monitoring of these and other mounds recorded, either in the proposed offset area or detected during pre-clearance surveys will also be required. It should be noted that the majority of records are associated with the area mapped as Deep Sand Mallee by Val (2001) and although this may reflect survey effort, at least some of the monitoring should be undertaken in this vegetation community. Additional survey, including the use of aerial survey, may also be required in the vicinity of the development to obtain a better picture of the cumulative impacts on the population of Malleefowl in the area.

Five threatened raptor species (Spotted Harrier, Little Eagle, Grey Falcon, Square-tailed Kite and Black-breasted Buzzard) were considered as part of the assessment, with only the first two actually recorded on the site (which OEH considers as the most likely to be impacted). We agree that the impacts on foraging habitat are unlikely to be significant but believe that the single most important impact on these species is the loss of nest sites with the Little Eagle one of the species most likely to be impacted. At this stage no nests of threatened raptor species have been identified within either the development footprint or the proposed offset. Pre-clearance surveys will need to identify all raptor nests and, if possible, the species involved within the mine footprint and clearing must not commence until breeding is completed. Similarly, the indirect impacts of mine operations (noise, dust and lighting) may also need to be mitigated by survey (to identifying breeding sites adjoining the mine area), monitoring (to ensure breeding continues) and other action if nest are abandoned.

The Bush Stone-curlew is a very rare species in south western NSW with very few records, most of which are associated with vegetation near the Murray and Darling Rivers. Although they have a distinctive call, the area of the proposed is relatively remote and unless a landholder with knowledge of this species is in the area at night, a resident population could perceivably go undetected. This makes the record of this species within the EIS difficult to assess, but also potentially highly significant.

The Rufous Fieldwren has been included in the species assessment, based on records identified in this project and the West Balranald Mineral Sands Project to the south east of the current proposal. OEH has had discussions with the proponent and consultants involved with the latter project and has expressed doubt about the validity of these records (it would be a significant range extension and there can be confusion with the threatened Redthroat, particularly when identified on call alone). Call Playback (with identification confirmed through visual sighting) is the best method to confirm this species as both species appear to respond to playback of either species. Therefore, we agree that the impact on this species is unlikely to be significant, but also believe it probably should be removed from the overall assessment unless further evidence to confirm the identification of this species is provided.

The record of Stripe-faced Dunnart (based on teeth found in a fox scat) probably needs confirmation. There are very few records in south western NSW, NPWS has not captured this species in surveys in various habitats on Mungo National Park and a number of the other surveys with extensive pitfall trapping have not recorded this species either. Therefore, we agree that the impact on this species is unlikely to be significant, but also believe it probably should be removed from the overall assessment unless further evidence to confirm the identification of this species is provided.

We agree that the impact on Western Pygmy-possum may be significant, particularly given its possible preference for Belah-Rosewood Woodland. Once again it would be expected that a monitoring program would need to be established to determine the impacts of management in the proposed offset for this species.

We assume that the impact of the proposal on Corben's Long-eared Bat is considered significant in the Assessment of Significance, yet the other bats (Little Pied Bat and Inland Forest Bat) are not is due to the high density of this species relative to other sites. However, the threat to all species is similar with the loss of hollows used for roosting the key issue, although it is likely that suitable hollows are likely to develop over the next 10 to 20 years in the mallee if fire is excluded. We believe that the loss of high quality Belah-Rosewood Woodland is likely to have a significant impact on all bat species and particularly Corben's Long-eared Bat. Like other threatened species we propose that a comprehensive monitoring program will need to be established to ensure the management actions undertaken in the offset are achieving the improvements required to maintain threatened species populations, including these bats.

The possible record of the Long-haired Rat is both interesting and potentially significant. The only other *Rattus* species identified in the region is the Black Rat, and this is considered unlikely to be recorded such a distance from human residences. However, the Long-haired Rat is also very distant from regular populations with the only nearby records being two Australian Museum specimens and bones associated with the Walls of China, all from Mungo National Park. While the previous wet conditions probably supply adequate conditions for an abundance of this species to occur (as has happened in the Lake Eyre region in South Australia) there is no evidence of this species expanding into south western NSW in recent years. Further confirmation of the presence of this species may be detected in future monitoring programs.

Recommendations

Pre-clearing surveys will be required as part of a Clearing Protocol for the project, with particularly emphasis on tree hollows, raptor nests and Malleefowl mounds. If breeding activities encountered during these surveys, clearing can not undertaken until breeding has been finalised (such as by continual monitoring of Malleefowl mounds or the installation of remote cameras).

Before clearing commences, additional call playback for the Bush Stone-curlew be undertaken, particularly within Belah-Rosewood Woodland, to determine the extent of the

population and if resident birds are detected, develop an appropriate management plan (within the Biodiversity Management Plan) to minimise the impacts on this species.

It is recommended that as part of the ongoing maintenance of the offset that a comprehensive monitoring program be established to determine if the management actions implemented within the offset are beneficial to threatened species present including Bardick, Western Pygmy-possum, Corben's Long-eared Bat and other woodland species. This should include a number of survey methods including pitfall trapping and harp trapping necessary to identify the range of species potentially impacted by the proposal.

There is a need to establish a monitoring regime as described in the Malleefowl Monitoring System (www.malleefowlvictoria.org.au/documents/monmanual.pdf). Sites will need to be established surrounding the two mounds adjoining the mine footprint (particularly in the Campaspe mine path as this is unlikely to be disturbed until Year 15 (see Figure 29)), and a number of sites within the proposed offset. Consideration of aerial survey of the properties adjoining the project is also recommended to obtain greater information on the Malleefowl populations within this area.

Timing of land clearance

Section 6.6 of Appendix B (Page 124) states that land clearing will be undertaken to minimise impacts on threatened species 'where practicable'. Our experience with other projects undertaken by the proponent is that this has occurred on most occasions, but there have been incidents where clearing has occurred during the breeding season (despite pre-clearing surveyor concerns) with impacts on breeding birds and bats, including threatened species.

Recommendation

Because of past clearing practices and the high number of threatened species likely to be impacted by vegetation clearing on this project, the term "where practicable", or similar terms, must not be included in any documents associated with the BMP and clearing protocols.

Offset Strategy

Many of the issues relating to the deficiencies of the proposed offset area (Pages 128-139 of Appendix B) are discussed under the Flora Assessment above. As detailed, the greatest concern is the loss (and low offset ratio) of Belah-Rosewood Woodland which has a high proportion of hollows of all the vegetation communities. This community is likely to be the key habitat for a number of threatened species detailed in the assessment, including – Bush Stone-Curlew, Major Mitchell's Cockatoo, Varied Sittella and Corben's Long-eared Bat, some of which have been identified as being significantly impacted. The White-browed Treecreeper, a species declining to the east and south of the study area is also a Belah specialist (Val *et al.*, 2001) and so the loss of a large area of potentially high quality habitat is also likely to cause declines in this species in the local area. OEH does agree that the management of the mallee areas within the offset, particularly the exclusion of fire to allow hollows to develop means that it is probable that impacts of the proposal will be mitigated for other mallee dependant species, apart from perhaps Malleefowl.

Recommendation

As stated above, there is a requirement to undertake an intensive, long-term monitoring program to determine if the management in place is achieving the outcomes identified in the assessment. This program should establish a number of sites across the final offset including sites adjoining the development footprint and in the various vegetation communities, including areas of different condition. The surveys would aim to identify improvements in vegetation and habitat condition (ideally by undertaking a standard methodology such as BioMetric) at each of the sites and also the impacts on threatened

species populations through long-term surveys including, but not restricted to, pitfall trapping, bird census and harp-trapping.

Aboriginal Cultural Heritage Assessment

OEH notes that the survey and the assessment of Aboriginal cultural heritage for the Atlas-Campaspe Mineral Sands Project is a thorough and detailed report, and has been undertaken in accord with OEH policies and guidelines.

The detailed survey and assessment of Aboriginal cultural heritage within the area of the proposed development has been presented in the EIS (Appendix E). This assessment recorded 100 Aboriginal sites, consisting of isolated stone artefacts, stone artefact scatters, hearths, shell, and a scarred tree.

The assessment found that the majority of these sites (71) will not be impacted by the proposed development. Twenty nine (29) sites will be impacted by the proposed development; 14 will have partial impacts, 15 will have total impact. Of the 29 sites that will be impacted, 15 are isolated stone artefacts, 9 are stone artefact scatters, and 3 are stone artefact scatters with hearths. These sites have been described these as having low to moderate significance on the basis of rarity, representativeness and research potential.

Most (22) of the sites that will be impacted by the development occur along the road access route; 1 site is within the Campaspe impact zone, and 6 sites are within the Atlas impact zone. The footprint of the Campaspe impact zone has been designed to avoid an area (an ephemeral depression on the southern margin of the Campaspe deposit) that contains 5 Aboriginal sites (Campaspe 2, 3, 4, 5 and 6).

The views of the registered Aboriginal stakeholders on the cultural values of the development area were sought, and some general comments were provided. However no specific comments on the cultural values of the recorded locations were provided (Appendix E, Table 12).

Appendix E recommends a series of mitigation measures including on-going consultation with registered Aboriginal parties, avoidance where practicable of known Aboriginal sites, salvage of Aboriginal sites that would be subject to impacts, and monitoring of soil stripping activities. These issues have been carried forward to the EIS (Main Report) and Section 4.8.3 outlines a series of measures that are proposed to be included in a Heritage Management Plan.

A commitment to the development of a Heritage Management Plan is also clearly stated within Section 7.3.4, as follows:

Heritage Management Plan

A Heritage Management Plan would be developed in consultation with the Aboriginal community and the OEH. During development of the Heritage Management Plan, the Aboriginal community would be requested to provide advice on the storage of collected artefacts and the management of artefacts at the completion of Project activities (e.g. artefact replacement onto the post-mining landscape or retained for educational purposes).

Once formalised, the Heritage Management Plan would be implemented to manage potential impacts to Aboriginal heritage for surface disturbance throughout the life of the Project.

Recommendation

OEH recommends that a condition of approval for the project require that a Heritage Management Plan would be developed in consultation with the Aboriginal community and the OEH. This plan must include all of the measures proposed in Section 4.8.3 of the EIS, and in particular must include a protocol for the management of unexpected finds (including

Aboriginal burials), a schedule of locations that must be protected throughout the life of the project, and a schedule of locations that must be salvaged.

Mungo National Park

Night lighting

The EIS (Executive Summary, p19) contains the following information on night lighting.

Due to the distance to the Atlas-Campaspe Mine landform components (i.e. greater than 10 kilometres), no direct night-lighting impacts associated with the Atlas-Campaspe Mine are expected at key viewpoints within the Willandra Lakes Region World Heritage Area. An increased glow in the night sky may be experienced, particularly during overcast weather conditions.

Further detailed information on night lighting is contained in Section 4.14.3. OEH notes that the EIS has analysed landscape elevation and distance and does not anticipate any direct night lighting impacts at any of the elevated locations in Mungo National Park. The EIS does not commit to any mitigation measures at the Atlas Campaspe activity area beyond "restriction of night-lighting to the minimum required for operational and safety requirements".

This issue is of particular concern for the National Parks Service at Mungo National Park. Areas of Mungo National Park are at locally high elevation, in particular the crest of the Walls of China, and afford extensive vistas. The park is used by up to 30,000 people per year. A major feature of Mungo is the remote outback camping opportunities offered at the Main Campground and Belah Campground. These opportunities are part of a widely marketed tourism experience that is highly valued in western NSW. The National Parks Service conducts a number of night time activities for visitors as part of the Discovery Rangers programme, including slide nights and the interpretation of Aboriginal night sky features. This programme is an integral feature of visitor experience at the park, and any direct light impacts will diminish and devalue these activities. OEH notes that there are proposed mitigation actions at the Ivanhoe Rail Facility, where lighting would be directional and light shields would be used to minimise spill where practicable. Similar mitigation actions should immediately be installed at the Atlas and Campaspe work sites if any light spill is visible at Mungo National Park.

Recommendation

OEH recommends that the conditions of approval include a requirement that directional and light shields be installed at the Atlas and Campaspe work sites if there is any direct night light impacts at Mungo National Park, specifically the crest of the Walls of China, Red Top Tank Lookout, the Day use area Lookout, the main campground, and Belah campground.

Rehabilitation Strategy

Section 5 of the Main Report provides information on the Rehabilitation Strategy for the Atlas-Campaspe proposal. OEH has provided comments previously on the rehabilitation activities associated with the Ginkgo and Snapper Mineral Sands Projects. Although we agree that there has been success in regeneration of ground-layer species and shrubs, particularly grasses and chenopod species, demonstrated success in regeneration of over-storey species, particularly of Belah-Rosewood Woodland and, to a lesser extent, Mallee communities has not been achieved. We believe, given the nature of these vegetation communities, that clearing of these areas will require rehabilitation in the medium to long term (likely greater than 100 years) to return these communities to their original condition.

The inclusion of rehabilitation of the Wemen mine in Victoria (Pages 5-4 and 5-6) is not relevant to this project as the area was already significantly cleared for cropping prior to mining, and the final land uses (cropping and almonds) are not applicable options, due to the lower rainfall and unavailability of irrigation water. The inclusion of rehabilitation trials adjoining the mine area demonstrates that at least some local species may be established, but does not demonstrate that the community cleared has been effectively reinstated. OEH believes that this should be the aim of regeneration following a mining activity, and although this may only be achieved in the long-term, the rehabilitation to cropping land is not considered a viable option.

OEH has also previously commented on the proponents desire to retain voids and mounds as part of the final landform. Although this has no direct impact on biodiversity, it may alter the final communities that regenerate within the development footprint. For example, voids may encourage the settling of water and a different vegetation community may regenerate here, or more significantly, weeds may proliferate in this area and become a source of invasion for adjoining areas.

OEH agrees with the general principles involved in the vegetation regeneration within the mining area, but would expect to see a detailed rehabilitation plan identifying final rehabilitation targets including structural outcomes for vegetation communities, the monitoring program to measure success or otherwise of the regeneration and proposals for alternative actions if rehabilitation does not prove successful. Any monitoring should include the collection of BioMetric data to allow comparison to benchmarks to determine results of the rehabilitation program.

It is noted on Page 5-24 of the Main Report that there may be consideration of conversion of the rehabilitation area to conservation to supplement the proposed biodiversity offset. OEH would support this if the proponent can prove (through the criteria identified above) that the vegetation has been successfully rehabilitated and has actual conservation values, though we believe that this is highly unlikely in the short to medium term. However, if this outcome is to be achieved it is highly unlikely that grazing, as discussed in Section 5.3.1 of the Main Report, would be compatible with a conservation outcome, and we recommend that the Final Land use be considered as early as possible within the project to ensure appropriate management actions are implemented as soon as rehabilitation commences.

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