# Edward River Council

# Planning Proposal No 7

**This is an amended planning proposal for Lots 2 and 3 DP562598 and Lot 1 DP1121183 being 21701-21703 Riverina Highway also known as Kyalite Stables and proposes to zone the land R5 Large Lot Residential.**

# 1 INTRODUCTION

The gateway determination for this planning proposal was issued on 25 October 2012 and since this time Council has received a number of extensions in order to complete the planning proposal. The planning proposal applies to 21701-21703 Riverina Highway, Deniliquin and consists of three titles being Lots 2 and 3 DP562598 and Lot 1 DP1121183.

Council undertook government agency consultations in November 2012 but since this time there has been a delay in progressing this planning proposal. Work recommenced in 2015 with a planning focus meeting held on 24 June 2015 between Council, the proponent and the representatives from the Office of Environment and Heritage (OEH). Since this time, Council has engaged relevant specialists and has been working with the proponent and the government departments to address the key issues in the gateway determination. Council has now completed all specialist studies and has prepared this amended planning proposal. Council is now seeking a revised gateway determination.

# 2 BACKGROUND

## 2.1 Planning Proposal

The original planning proposal was prepared by Habitat Planning on behalf of Council and at its meeting on 14 December 2011, Council resolved:

> *'That Council forward the Kyalite Stable Planning Proposal to the Minister for Planning and Infrastructure for gateway determination in accordance with section 56(1) of the Environmental Planning and Assessment Act 1979 to amend the Deniliquin Local Environmental Plan 1997 to rezone part Lot 3 DP562598, Lot 2 DP562598 and Lot 1 DP1121183 Riverina Highway from 1(a) General Rural to R5 Large Lot Residential'.*

Council received a request for additional information to support the planning proposal on 2 February 2012 from the Department of Planning and Infrastructure. Council responded to this request on 21 March 2012. Appendix 1 is the original planning proposal. Additional information submitted to support the planning proposal (and as requested by the Department is available upon request).

## 2.2 Gateway Determination

A gateway determination was issued on 25 October 2012 subject to a number of conditions. Appendix 2 is the gateway determination. The gateway determination was subject to the following conditions:

a Council to address inconsistencies with Section 117 Directions 1.2 Rural Zones, 1.5 Rural Lands and 2.1 Environmental Protection Zones and demonstrate how it intends to facilitate the protection and conservation of environmentally sensitive lands.

b Council to address the requirements of State Environmental Planning Policy 55 Remediation of Land and the Contaminated Land Planning Guidelines. An initial site contamination investigation is to be prepared demonstrating that the site is suitable for rezoning to the proposed zone.

c Council to address specific principles of clause 10 of the Murray Regional Environmental Plan No 2 – Riverine Land being bank disturbance, flooding, land degradation, river related uses, settlement and wetlands.

d Community consultation must be undertaken in accordance with the Environmental Planning and Assessment Act and the terms of the gateway determination.

e Consultation to be undertaken with the following public authorities:

- Commonwealth Civil Aviation Safety Authority – as per the requirements of Section 117 Direction 3.5 Development Near Licensed Aerodromes;
- Murray Catchment Management Authority
- NSW Department of Primary Industries – Agriculture
- NSW Department of Primary Industries (Minerals and Petroleum) – as per the requirements of Section 117 Direction 1.3 Mining, Petroleum and Extractive Industries;
- Office of Environment and Heritage (Flooding and NSW National Parks and Wildlife Service) – with respect to flooding and to address the requirements of Section 117 Direction Flood Prone Land;
- NSW Rural Fire Service – as per the requirements of Section 117 Direction 4.4 Planning for Bushfire Protection;
- Transport for NSW (Roads and Maritime Services) – address the requirements of Section 117 Direction 6.2 Reserving Land for Public Purposes

## 2.3 Government Agency Consultation

Letters were sent to government agencies as detailed in the condition 6 of the gateway determination on 20 November 2012 and responses (Appendix 3) were received from the following agencies:

- **Roads and Maritime Services**

  Lots with direct frontage to Riverina Highway should be denied direct access to the Riverina Highway. The potential for road connectivity from the subject development site to the future subdivision of the surrounding land holdings should be investigated and provided for. A strategic approach to the consideration of rezonings in the area may provide an option for access to adjoining land holdings and for the provision of a road access from Rose Street to the subject site. To address the current standard of construction of Rose Street and its intersection with the Riverina Highway rather than create a new intersection to the highway may prove beneficial to the subject site and the broader community.

  A significant majority of traffic generated by the subdivision would be to and from Deniliquin requiring access into the subdivision via a right turn manoeuvre from the Riverina Highway. Based on the traffic volumes on the Riverina Highway and the expected traffic generation due to the proposed development the intersection of the proposed driveway with the Riverina Highway is required, as a minimum, to be designed and constructed as a Basic Right Turn (BAR)/Basic Left Turn (BAL) treatment.

The land zoned SP2 has been identified as being required for future road widening purposes and may in the future be acquired by RMS for road purposes.

Consideration should be given to the establishment and maintenance of a landscaped buffer area along the frontage of any proposed allotment to the highway for visual reasons and to address impacts of headlights on any future dwellings.

The RMS response provided a list of 'conditions' which should be considered for the proposed development for road safety reasons as the subject site has frontage and access to the Riverina Highway, which is a classified road and within a 100km/h speed zone.

- **NSW Rural Fire Service**
  The NSW Rural Fire Service advised that any future lot created that includes land within the riparian corridor must have sufficient area where bushfire hazard reduction is permissible in order to achieve a complying Asset Protection Zone.

- **Civil Aviation Safety Authority**
  CASA advised that they have no jurisdiction over local land use planning but Council should confirm that the development falls outside the Obstacle Limitation Surface and PANS-OP airspace and sensible cladding material should be used during construction and external lights should be shielded below the horizontal to minimise glare and possible effects on pilots.

- **Office of Environment and Heritage**
  OEH advised that they did not support the planning proposal for the southern half of the subject land and the proposed subdivision design should be amended to delete the proposed river frontage lots. The minimum lot size for these lots should be increased to 2ha.

**Flooding**

Council needs to confirm that the potential impact of proposed rezoning will be of minor significance for the flood prone section of the land. From the information provided it suggests that in the 1%AEP event, water would cover this land albeit at a shallow depth. The current flood planning level of 1%AEP + 100mm is in contravention of current planning advice which stipulates that the FPL should be 1%AEP + 500mm. Definitive comments cannot be made until Council has completed its flood study, reviews its flood planning area and FPL and considers any cumulative impacts and the impacts on neighbouring properties.

**Aboriginal Cultural Heritage**

An on-ground cultural heritage survey of the area should be conducted to allow for a more informed decision to be made on the suitability of the land to be rezoned.

**Impact on Adjoining National Park**

Impacts on vegetation in the Murray Valley Regional Park and visual impacts upon the landscape where the construction of dwellings, sheds or other structures occurs within the riparian area should be specifically addressed in the assessment.

**Other matters**
Concern around the potential creation of additional domestic water rights and OEH considers that it is inappropriate for new subdivisions to include direct frontage to rivers and streams.

Onsite effluent disposal is considered to be unsuitable in the river frontage riparian environment and OEH would consider that the provision of sewerage infrastructure to the site is mandatory.

OEH expects that an assessment of the potential direct and indirect impacts on threatened species of the rezoning of this area be conducted.

# 3 SUBJECT SITE

## 3.1 Planning Controls

Since the issuing of the gateway determination, Deniliquin Local Environmental Plan 2013 (LEP 2013) has been made and applies to this land. The land is zoned:

- Part R5 Large Lot Residential,
- Part RU1 Primary Production, and
- Part SP2 Infrastructure (Classified Road).

Figure 1 shows the zones applying to the land.

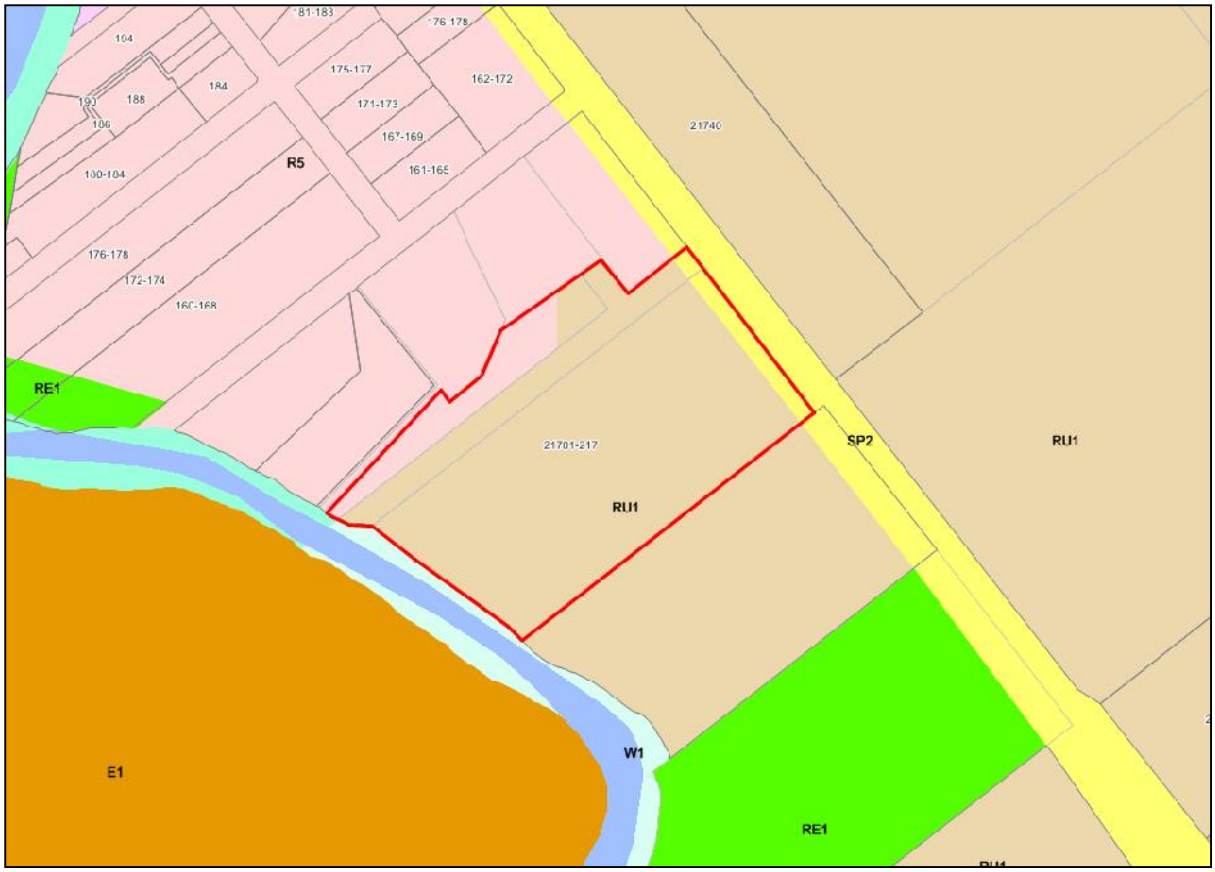

**Figure 1** Zoning of subject sites, LEP 2013

It is proposed to rezone the land zoned RU1 to R5 Large Lot Residential. In terms of the land zoned SP2, under clause 5.1 of LEP 2013 (see LEP 2013 Land Reservation Acquisition Map Sheet LRA_005) it has been identified for the purposes of section 27 of the Environmental Planning and Assessment Act to be acquired by the Roads and Maritime Service.

The following minimum lot sizes currently apply to the land:

- RU1 Primary Production – 40ha,
- R5 Large Lot Residential – 1ha or 5000m$^2$ if connected to reticulated sewer, and
- SP2 Infrastructure – no minimum lot size

The subject site has also been identified on the LEP 2013 Terrestrial Biodiversity Map Sheet BIO_005 and is adjoining the Edward River which has been identified on the LEP 2013 Riparian Land and Watercourses Map Sheet WCL_005.

The land is located within the flood planning area identified by the Edward River at Deniliquin Flood Study (WMAwater 2014). The LEP 2013 does not contain mapping which identifies the flood planning area or a clause that identifies a flood planning level.

## 4 PROPOSED DEVELOPMENT

The planning proposal originally proposed a 13 lot community title, the construction of a road, and a neighbourhood lot.

The development plan for the land has been reviewed and proposes a 7 lot subdivision and construction of a road. Lots would vary in size from 1.2ha through to 2.6ha. There would be 5 lots with frontage to Edward River and the remaining two lots would adjoin the Riverina Highway. All of the lots with frontage to the Edward River will have building and access envelopes identified.

Appendix 4 is the proposed subdivision layout.

## 5 SITE SPECIFIC ISSUES

The gateway determination and government agency consultations highlighted a number of issues that are required to be addressed prior to exhibition of the planning proposal.

### 5.1 Inconsistencies with Section 117 Directions

The gateway determination identified that the planning proposal was inconsistent with Section 117 Directions 1.2 Rural Zones, 1.5 Rural Lands and 2.1 Environmental Protection Zones and Council had to address these inconsistencies and demonstrate how it intends to facilitate the protection and conservation of environmentally sensitive land.

The Section 117 Directions are considered in Appendix 5. However, in response to the specific Directions identified by the gateway determination the following comments are made:

- **Direction 1.2 Rural Zones**
  This direction applies to this planning proposal as it proposed to rezone land from a rural zone to a residential zone. It is proposed to rezone approximately12.63ha of land zoned RU1 Primary Production to R5 Large Lot Residential. The planning proposal is inconsistent with this direction but the inconsistency is considered to be of minor significance given the small area of rural land that is to be rezoned to residential. The area of the land means that it has limited agricultural value or capability and the volume of land to be rezoned is considered insignificant when considered in the context of the land available for agriculture across the whole Council area.

- **Direction 1.5 Rural Lands**
  Clause 3(a) of this direction applies to the planning proposal as it affects land within an existing rural zone. The planning proposal is inconsistent with this direction but the inconsistency is considered to be of minor significance when considered in the context of the rural planning principles.

  The following comments in relation to the rural planning principles are provided:

  a The promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas.

*The subject site has 12.63ha of RU1 zoned land and in the context of the land area zoned RU1 in the Council area, the rezoning will not undermine will not undermine opportunities for current and potential productive and sustainable economic activities in rural areas.*

b Recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State.
*The rezoning of the subject site does not undermine the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State. The subject site is small in area when considered in the context of rural land within the Council area, the region and the State.*

c Recognition of the significance of rural land uses to the State and rural communities, including social and economic benefits of rural land use and development.
*Rural land uses are of a great importance to Council and its communities and readily acknowledged the social and economic benefits of rural land use and development. The rezoning of the subject site does not undermine this importance when considered in the context of the amount of rural land within the Council area.*

d In planning for rural lands, to balance the social, economic and environmental interests of the community.
*Council has considered the social, economic and environmental interests of the community as part of preparing this planning proposal. The reduction in rural land does not significantly impact on the social, economic and environmental interests of the community given the size of the land and within the context of the land currently zoned for rural uses in the Council area.*

e The identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land.
*Specialist reports have been prepared addressing site specific issues such as flooding, biodiversity and Aboriginal cultural heritage. These reports have concluded that subject to conditions, the planning proposal can proceed.*

f The provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities.
*The planning proposal does not detract from opportunities to provide a rural lifestyle in other villages within the Council area.*

g The consideration of impacts on services and infrastructure and appropriate location when providing for rural housing.
*The planning proposal does not propose to provide for rural housing. However, the subject site is capable of being serviced.*

h Ensuring consistency with applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General.
*There is no regional strategy that applies to this region.*

- **Direction 2.1 Environmental Protection Zones**
Council does not consider that this direction applies to this planning proposal. The Direction states that an LEP must include provisions that facilitate the protection and conservation of environmentally sensitive areas and land within an environment protection zone or land otherwise identified for environment protection purposes in a LEP must not reduce the environmental protection standards that apply to the land (including by modifying development standards that apply to the land).

The specialist studies for flooding, biodiversity and Aboriginal cultural heritage do not identify any environmentally sensitive land that requires protection by the introduction of an environmental protection zones. However, Council does recognise the flooding sensitivity of the land and the importance of retaining the existing vegetation and as a result proposes to introduce controls into the LEP to address these issues.

**5.2 State Environmental Planning Policy 55 Remediation of Land (SEPP55)**
Council is required to consider SEPP55 when preparing a planning proposal and in particular clause 6.

Aerial photography from 2008 shows that part of the site has been used for agriculture. Figure 2 is an extract from this photography showing the subject site and the bays used for cropping.

Table 1 of the 'Managing Land Contamination Planning Guidelines' (Department of Urban Affairs and Planning/Environment Protection Authority, 1998) lists agricultural activities as a potentially contaminating land use.

A detailed site investigation would be required for part of the site as part of any development application submission.

**Figure 2** Aerial photography showing use of part site for agriculture

### 5.3 Murray Regional Environmental Plan No 2 – Riverine Land (REP2)

The gateway determination requires Council to consider the following specific principles of clause 10 of REP 2:

- **Bank disturbance**
  The proposed rezoning and subsequent development of the land may result in disturbance to the shape of the bank and riparian vegetation. This may occur as a result of ancillary development eg water recreation structures. These issues would be addressed when a development application is lodged usually for integrated development under the Environmental Planning and Assessment Act. This means that State Government agencies will consider these issues as part of their assessment of the development application.

- **Flooding**
  Refer to comments below regarding flooding.

- **Land degradation**
  The planning proposal includes an assessment of impacts on biodiversity (including the impacts of vegetation removal) which has concluded that there will be no significant impacts on biodiversity. The planning proposal also includes a number of LEP clauses to minimise impacts on flooding, controls for the retention of vegetation and development within the river front area.

- **River related uses**

The subject site does have frontage to the Edward River and this principle states that only development which has a demonstrated, essential relationship with the river should be located on land adjacent to it and other development should be set well back from the river bank. The planning proposal proposes that a river front area be established for the subject site which limits development that can occur in that area. The basis for the river front area is the location of the building envelopes, flood modelling and maximising the retention of vegetation on site. In addition to this building and access envelopes will ensure that development is confined to particular areas on the site.

The development will not provide public access to the foreshore. However within the former Deniliquin Council area there are well established access points to the river including Twin Rivers Reserve (approximately 350m from the subject site), the Murray Valley Regional Park (opposite the site and almost 400ha in area) and various other public recreation areas with river frontage in Deniliquin (McLeans Beach reserve, Beach to Beach foreshore walk etc).

- **Settlement**
  Flooding - The subject site is not flood free land but flood modelling has been undertaken and concluded that the site will not be located within a floodway and will not result in significant flood impacts for adjoining land (refer to comments below about flooding).

  Existing services and facilities – Services are available within the vicinity of the site and it is proposed that these will be extended to the site.

  Prime crop and pasture land – Part of the subject site is currently zoned for primary production but as discussed in other parts of this document the land is not suitable for primary production due to its size.

- **Wetlands**
  There are no wetlands identified on the site.

The following issues were raised during consultation with State Government agencies. Consultation with these agencies was required by condition 6 of the Gateway determination.

### 5.4 Obstacle Limitation Surface/PANS-OPS Airspace (CASA)

The site is located within the obstacle limitation surface and the PANS-OPS Airspace for the Deniliquin airport but it is unlikely that the development will penetrate the OLS given its distance from the Deniliquin airport and the type of development likely to occur on the site (eg dwellings and ancillary sheds).

### 5.5 Cladding Materials (CASA)

CASA stated that sensible cladding materials should be used for any future development and external lights should be shielded blow the horizontal to minimise glare and possible effects on pilots. These issues can be considered when a development application is assessed for the site.

### 5.6 Flooding (OEH)

The site is located within the flood planning area and the Office of Environment and Heritage identified that Council would need to confirm that the potential impact of the rezoning on flooding will be of minor significance.

Council engaged WMAwater to undertake a flood study for the subject site (Appendix 6). Conceptual features were assessed for their impact on flooding and included:

- Access roads between Riverina Highway and each of the proposed lots.
- Culverts beneath each of the access roads.
- A building envelope for each lot modelled as a 600m$^2$ raised at the 1%AEP flood level plus freeboard.

The site experiences widespread inundation in large floods. When the river's capacity is exceeded during a flood, flow spreads over the site eventually reaching the Riverina Highway. The entire lot is inundated in the 1%AEP event with a maximum flood level of 92.97mAHD on the south east boundary, a maximum depth of over 4m and most of the site having 0.6-0.8m depth of inundation. Widespread inundation of the site first occurs in the 5% AEP.

The site is affected by a mix of low and high hazard flow in the 1%AEP event and also contains a section of floodway. Areas of floodway do not infringe on proposed building envelopes and the balance of the site is classified as flood fringe.

The conceptual works were assessed for their impact on existing flood behaviour in the vicinity of the property. The works include filling areas of the floodplain which has the potential to increase peak flood levels in the vicinity of the works. Results show that the proposed development does not cause adverse offsite impacts in the 1% AEP event. There is a slight increase of up to 0.05m in peak flood level where one of the access roads impedes flow but this increase does not affect any neighbouring properties. There are no other adverse impacts on or adjacent to the site.

In terms of the flood emergency response, the site has significant evacuation constraints as it can be completely inundated and cut off during a flood event. Evacuation for the site will be required if an evacuation order is issued by the SES. Access roads on the site are proposed to be set at 92.60mAHD which is the elevation of the Riverina Highway and will ensure roads on the site do not impair evacuation (nevertheless they will be flooded in a large flood). The access roads will be inundated by a depth of 0.3m in the 1%AEP event meaning that access will be possible for most vehicles in slightly smaller events.

There are issues associated with the site's emergency response:

- The site's location on Deniliquin's outskirts is quite isolated which will make potential rescues during a large flood more difficult than for most other properties;

- The location also means more detailed information will be required for flood awareness, as access to South Deniliquin will be via North Deniliquin and Davidson Street, both of which have flood affectation. Flood awareness must describe the reliance on these two areas and their flood behaviour. If the need for evacuation is solely based on the affectation at the property, once the need to evacuate is recognised, it will be too late to evacuate to South Deniliquin;
- Flood awareness information must not understate the risk of flooding. There is high hazard flow across most of the site in a large event, and houses built above the flood level will not be inhabitable during a flood due to the long duration of flooding. The access roads on the property will be inundated in a large enough flood and impair or prevent evacuation. It is important that this information is conveyed to residents and property owners and evacuation orders are heeded, given the area's reliance on Davidson Street and North Deniliquin.

Council currently resolved to exhibit the draft Deniliquin Floodplain Risk Management Study and Plan (WMAwater 2016). This Plan recommends a flood planning level of 1%AEP + 500mm for land within the floodway and a flood planning level of 1%AEP + 300mm for land within the balance of the flood planning area. These flood planning levels have been determined in consultation with the Office of Environment and Heritage. Extracts from the draft Deniliquin Floodplain Risk Management Study and Plan (WMAwater 2016) detailing the proposed flood planning levels are in Appendix 7.

It is proposed the model clause 7.3 Flood planning will be inserted into the LEP 2013 applying specifically to the subject site. As required by this model clause a Flood Planning Map will also be prepared (based on the flood planning area identified in the draft Plan) and a FPL will be inserted.

Given the nature of flooding on this site and the flood modelling being based on a specific development occurring on the site (ie access roads and building envelopes in particular areas), it is proposed to introduce specific controls to ensure that development occurs within the building and access corridor envelopes identified for the flood modelling. These measures include:

- Minimum lot size - The purpose of introducing specific minimum lot size controls for the subject site will be to allow the creation of the 7 lot subdivision however, no future subdivision of lots 12-16 will be permissible. For this to occur, the LEP 2013 Lot Size Map – Sheet LSZ_005 will be amended to show proposed lots 12-15 having a minimum lot size of 1.2ha and proposed lot 16 having a minimum lot size of 2ha. Proposed lots 10 and 11 will have a minimum lot size which is consistent with existing R5 zone (being 1ha except where land is connected to the reticulated sewer, the minimum lot size is then 5 000$m^2$).

- Controls to ensure that the building and access envelopes identified for the flood modellings cannot be moved. These controls will be drafted in consultation with the Department and will include the establishment of a river front area between the building envelopes and the river to ensure that they cannot be moved closer to the river.

## 5.7 Aboriginal Cultural Heritage (OEH)

OEH required an on ground cultural heritage survey of the area to be conducted to allow a more informed decision to be made on the suitability of the land to be rezoned from a cultural heritage viewpoint.

Council engaged NGHenvironmental who prepared the Aboriginal Heritage Due Diligence – Kyalite Stables Deniliquin Due Diligence (August 2016) (Appendix 8). There are no sites registered with the Aboriginal Heritage Information Management System (AHIMS) on the subject site but 23 sites have been recorded in the general vicinity. The terrain features within the project area have the potential to be of high archaeological sensitivity based on the proximity to Edward River which runs adjacent to the south western boundary. This is in accordance with the landscape model provided in the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales which outlines that areas within 200m of water have higher potential to contain Aboriginal objects.

A field assessment was carried out on 2 August 2016 and the subject site was assessed as having negligible potential to contain Aboriginal objects and no Aboriginal artefacts were identified. Mature trees within the vicinity of the project area were visually inspected and considered not to be culturally modified.

The report concluded that the proposed rezoning and subsequent subdivision is unlikely to impact Aboriginal heritage objects. No further assessment is required for Aboriginal sites and objects and the activity can proceed with caution and the following recommendations have been made:

- The proposed rezoning and subsequent subdivision should be limited to the subject site as assessed in the report so as to limit the possibility of encountering Aboriginal objects or culturally modified trees in unassessed areas.
- Any activity proposed outside of the current assessment area should also be subject to an Aboriginal heritage assessment.
- If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and OEH notified. The find will need to be assessed and if found to be an Aboriginal object an Aboriginal Heritage Impact Permit may be required.

## 5.8 Impact on Adjoining National Park (OEH)

**Impacts on vegetation surrounding the Murray Valley Regional Park**

Council proposes to establish a river front area which will provide a buffer between the Regional Park and the proposed development. The river front area restricts development within the this area and the river itself provides a buffer between the subject site and Regional Park with the majority of the development will be confined to the building and access envelopes. Council considers that the development will have minimal impact on the Murray Valley Regional Park.

**Visual impacts on landscape from development**

As stated above, a river front area will be established on the subject site and will restrict development in this area. In addition to this, the majority of the development on the site will be contained in the building and access envelopes. In considering these two factors it is considered that future development of the land will not have a significant visual impact on the landscape.

### 5.9 Domestic Water Rights (OEH)

Council notes the comments on creating additional domestic water rights and acknowledges that additional domestic water rights will be created should the development proceed.

### 5.10 Provision of Sewer (OEH)

Sewer is available within the vicinity of the site and it is the intention of the proponent to extend it to the development. Council supports the extension of sewer to the site.

### 5.11 Biodiversity (OEH)

OEH required an assessment of the potential direct and indirect impacts on threatened species of the rezoning to be undertaken.

Council engaged NGHenvironmental to conduct a biodiversity assessment (Appendix 9). The assessment concludes that the impacts to biodiversity would be minor as a result of the proposed rezoning. The primary impact is from the proposed removal of ground cover vegetation. Residual impacts can be further reduced or mitigated by implementing a number of mitigation measures. The subject site is within a modified landscape that has previously been dominated by agriculture. The land has been used for cropping and/or extensive livestock grazing and where native vegetation remains in such areas, it is often restricted to scattered trees and watercourses. Extensive clearing has resulted in heavily reduced ecological connectivity between remnant vegetation communities and adjacent lands. No threatened vegetation communities listed under the Threatened Species Conservation Act or the Environment Protection and Biodiversity Conservation Act are present within the subject site.

Fauna habitat values at the site include hollow-bearing trees and fallen timber. Any impact to fauna at the site would be minor as the subject site is located in previously disturbed environment with poor structural diversity. Whilst the proposal area provides some suitable foraging and nesting habitat for fauna, similar vegetation exists in the study area and adjacent lands.

Vegetation removal would be kept to a minimum amount within the proposal site and proposed work would be undertaken from previously disturbed areas, therefore reducing the potential for impacts to retained adjacent habitat. Overall the loss of fauna habitats is not likely to lead to a substantial decline in availability of resources such that fauna populations would be affected.

Assessments of the significance to assess impacts on state and federally listed threatened biota were conducted. The assessments found a significant impact was not likely on any threatened biota. A Species Impact Statement or Referral to the federal Environment Minister is not required.

### 5.12 Bushfire (RFS)

The RFS stated that any future lot created that includes land within the riparian corridor must have sufficient area where bushfire hazard reduction is permissible in order to achieve a complying Asset Protection Zone. Clause 5.11 of LEP 2013 states that bushfire hazard reduction is permissible without development consent on any land. Any development application for the land will consider bushfire issues based on a BAL assessment.

### 5.13 Land Reserved for Acquisition (RMS)

Part of the subject site is zoned SP2 Infrastructure (Classified Road) and has been identified on the LEP 2013 Land Reservation Acquisition Map – Sheet LRA_005. This land is approximately 20m wide and has been identified for future road widening purposes for the Riverina Highway.

The Roads and Maritime Service have advised that as part of this planning proposal process they may be in a position to review the need for the required road widening of the Riverina Highway along the subject site.

### 5.14 Access to Riverina Highway (RMS)

It is proposed that a road will be constructed so that all lots will be accessed via this road and there will be one access point onto the Riverina Highway. There is potential for other land holdings (and particularly the holding to the east of the subject site) to connect into the proposed road if required.

### 5.15 Physical Road Construction Requirements (RMS)

The RMS submission has a number of requirements relating to the future road construction. These are issues that can be addressed upon submission of a development application.

### 5.16 Landscape Buffer Along Riverina Highway (RMS)

Council supports this proposal and will be considered upon submission of a development application.

## 6 OBJECTIVES OR INTENDED OUTCOMES

The objective of the planning proposal is to allow the subject site to be developed for rural residential purposes.

## 7 EXPLANATION OF PROVISIONS

The proposed outcome will be achieved by:

a Amending the LEP 2013 Land Zoning Map – LZN_005 for the subject site to rezone the land currently zoned RU1 Primary Production to R5 Large Lot Residential.

b Amending the LEP 2013 Lot Size Map – Sheet LSZ_005 for the subject site so that proposed lots 12-15 will have a minimum lot size of 1.2ha and proposed lot 16 will have a minimum lot size of 2ha. Appendix 10 shows the proposed minimum lot size map.

c Amending the LEP 2013 by inserting a clause relating to flood planning that will identify the flood planning area as it applies to this land and stating that the flood planning level for this land will be 1%AEP + 300mm. Appendix 11 is a map showing the flood planning area.

d Amending the LEP 2013 by inserting a clause relating to a river front area (similar to the clause the Murray Local Environmental Plan 2011) and creation of a map showing the river front area. Appendix 12 is a map showing the proposed river front area.

e Inserting provisions into LEP 2013 (map or clauses and in addition to the river front area) that prevents the movement of the building and access envelopes as determined in consultation with the Department.

In addition to the LEP changes, it is proposed to amend Deniliquin Development Control Plan 2016 so that clause 5.9 (preservation of trees or vegetation) of the LEP 2013 applies to this land.

## 8 JUSTIFICATION

### 8.1 Is the planning proposal a result of any strategic study or report

The planning proposal is not the result of any strategic study or report.

### 8.2 Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The objectives or intended outcomes can only be achieved via a planning proposal.

### 8.3 Is the planning proposal consistent with the objectives and actions of the applicable regional or sub-regional strategy?

There is no regional or sub-regional strategy applying to Edward River Council.

### 8.4 Is the planning proposal consistent with a council local strategy or other local strategic plan?

Edward River Council does not have a local strategy or other local strategic plan that would apply to the subject site.

### 8.5 Is the planning proposal consistent with the applicable State Environmental Planning Policies?

State Environmental Planning Policies have been considered in Appendix 13. The only SEPP applicable to this proposal is SEPP55.

### 8.6 Is the planning proposal consistent with applicable Ministerial Directions?

Section 117 Directions have been considered in Appendix 5 and other parts of this document. Where the planning proposal is inconsistent with a Section 117 Direction, Council considers the inconsistency to be of minor significance and justification for the inconsistency has been provided.

**8.7 Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?**

The biodiversity assessment has concluded that the proposed rezoning will not have an adverse impact on critical habitat, threatened species, populations or ecological communities/habitats.

**8.8 Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?**

Environmental effects resulting from this planning proposal and options to manage have been discussed throughout this document.

**8.9 Has the planning proposal adequately addressed any social and economic effects?**

The main issues surrounding this planning proposal relate to environmental issues eg flooding, biodiversity and Aboriginal cultural heritage. Should the rezoning proceed, there will be additional rural residential land available in a highly desirable location. Social and economic effects are likely to be positive given the additional economic activity the subdivision will generate.

**8.10 Is there adequate public infrastructure for the planning proposal?**

Public infrastructure is available within the vicinity of the site and it is proposed that it will be extended to service future development.

**8.11 What are the view of state and Commonwealth public authorities consulted in accordance with the Gateway determination?**

State government agencies were consulted as required by the initial Gateway determination and their responses have been addressed in this amended planning proposal.

## 9 MAPPING

The mapping for this planning proposal will be as follows:

- Amending the LEP 2013 Land Zoning Map – LZN_005 for the subject site to rezone the land currently zoned RU1 Primary Production to R5 Large Lot Residential.

- Amending the LEP 2013 Lot Size Map – Sheet LSZ_005 for the subject site so that proposed lots 12-15 will have a minimum lot size of 1.2ha and proposed lot 16 will have a minimum lot size of 2ha. Refer to Appendix 10.

- Creation of a new map showing the location of the flood planning area for the site. Refer to Appendix 11.

- Creation of a new map showing the location of the river front area. Refer to Appendix 12.

- Possible creation of mapping to support provisions that prevent the movement of the building and access envelopes as determined in consultation with the Department.

## 10 COMMUNITY CONSULTATION

In accordance with section 57 of the Environmental Planning and Assessment Act, it is proposed to exhibit the planning proposal for 28 days in the local media and on Council's website. Adjoining property owners will also be notified.

## 11 PROJECT TIMELINE

Council has been given an extension by the Department to complete this planning proposal by 2 May 2017.

# Appendix 1

**Original Planning Proposal (December 2011)**

## Riverina Highway, Deniliquin

# PLANNING PROPOSAL

## Deniliquin Council

**DECEMBER 2011**

Habitat Planning

**This report has been prepared for**

Deniliquin Council
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CPP
CERTIFIED PRACTISING PLANNER

Document Control

| Version | Date | | Author | Reviewed | Approved |
|---|---|---|---|---|---|
| A | 30/04/10 | Draft | AP | WH | |
| A | 04/05/10 | Final draft for client review | WH | | |
| B | 24/08/11 | Review | SB | | |
| B.2 | 05/12/11 | Review | SB | | |

# CONTENTS



# APPENDICES

# 1. INTRODUCTION

Habitat Planning has been engaged by Deniliquin Council on behalf of the owner of Lot 1 in DP1121183 and Lots 2 and 3 in DP 562598 on the Riverina Highway at Deniliquin ("the subject land") to prepare a Planning Proposal for an amending Local Environmental Plan. The amendment sought is by way of rezoning the subject land to allow rural residential development.

The application for rezoning is supported by Deniliquin Council.

The Planning Proposal has been prepared in accordance with the Department of Planning's *A Guide to Preparing Planning Proposals* and other information specified in Council's consultant brief.

## 1.1 BACKGROUND

Decentralised Demountables Pty Ltd is the owner of all three lots that form the subject land collectively known as 'Kyalite Stables'. Lots 2 and 3 are long and narrow (Lot 2 appearing to be a closed road) with Lot 1 the largest of the three in a more rectangular configuration. Lots 1 and 2 both have frontage to the Riverina Highway, whilst Lot 3 relies on an informal arrangement to gain access to the highway via Lots 1 and 2 Lots 2 and 3 of DP 562598 and Lot 1 of DP 1121183 are zoned 1(a) General Rural under the *Deniliquin Local Environmental Plan 1997* however part of Lot 3 DP562598 is also zoned 1(c) Rural Small Holdings, which is understood to be due to a mapping error. The areas of the lots are:

- Lot 1: 10.35ha
- Lot 2: 1.692ha
- Lot 3: 1.544ha.

The owners of the subject land made a request to Council in July 2009 to rezone the three lots from 1(a) General Rural to R5 Large Lot Residential. In support of the request, the owners have provided an indicative plan showing a 13 lot Community Title subdivision, with four lots proposing frontage to the Edward River. The purpose of the request is to provide additional large residential lots in Deniliquin with access to the river.

The subject land is currently used for grazing purposes but in the past has been used for cropping (as recently as 2008) and as a horse stud. Each lot contains a dwelling although that on Lot 2 closer to the river is understood to be uninhabitable. The site is not serviced by water or sewer.

The request for rezoning was submitted to Council in July 2009 for the purpose of subdividing the three lots into a 13 lot community title subdivision. An application for the subdivision has not been formally submitted and will not be submitted until confirmation of the new zoning.

Plans illustrating the current and proposed lot alignments, zoning, bushfire threat and flood liable land are contained in Attachment A.

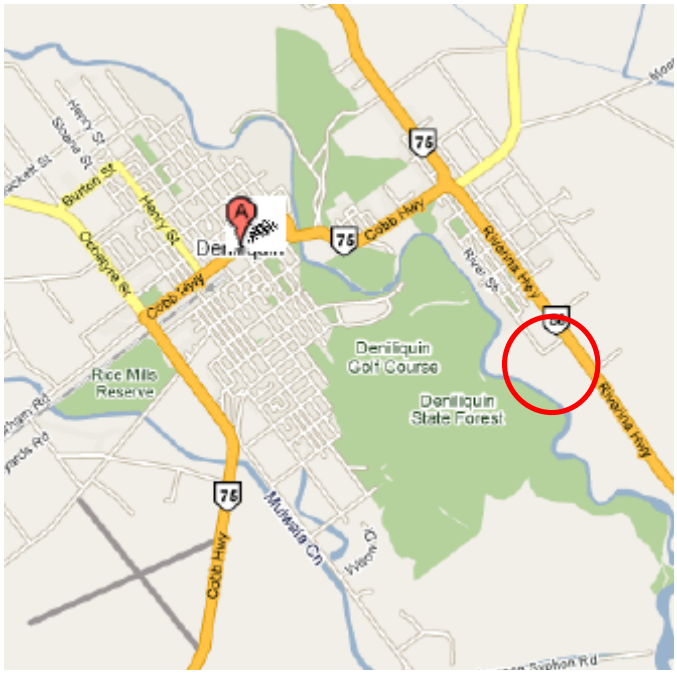



**Figure 1 –** Location of subject land within the context of Deniliquin (Source: Google Maps 2010)

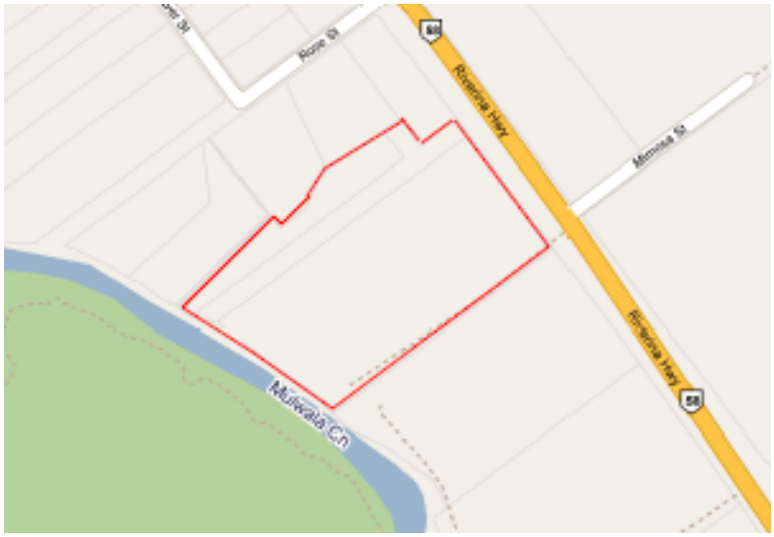



**Figure 2 –** Subject land within the context of its neighbourhood (Source: Google Maps 2010). Note the map incorrectly identifies the Edward River as the Mulwala Canal.

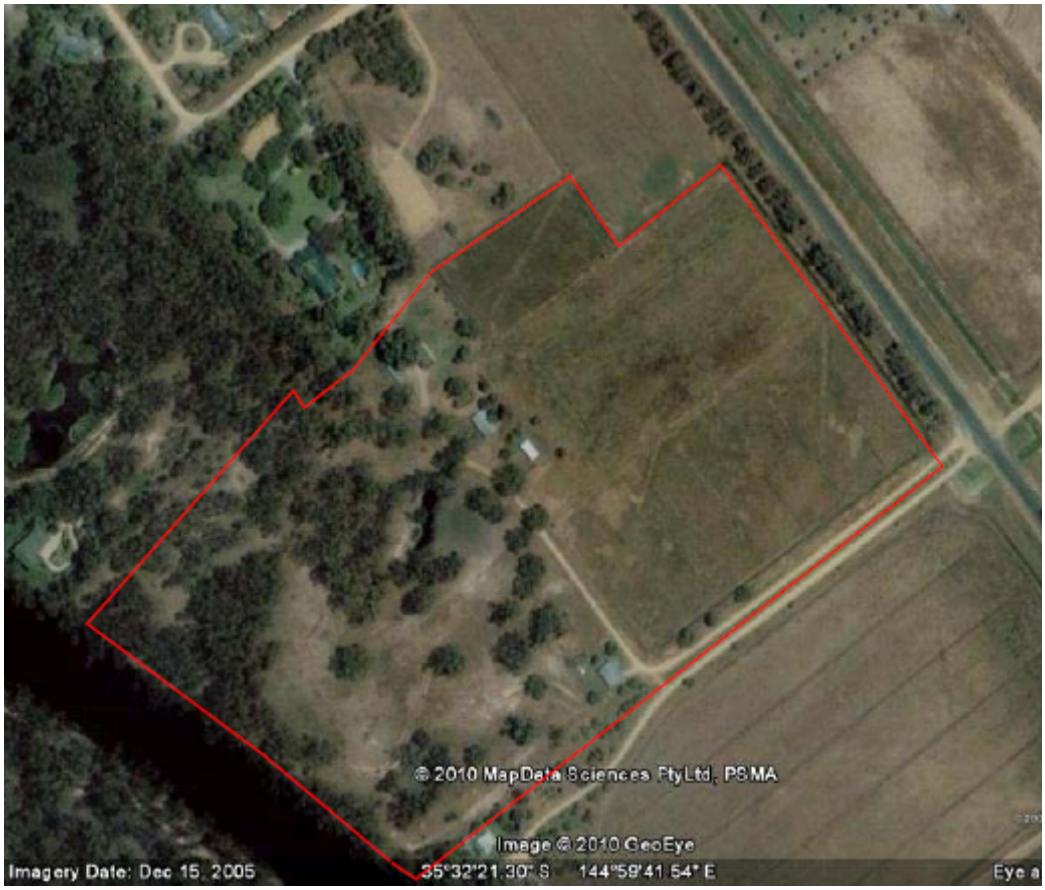



**Figure 3 –** Aerial view of subject land (Source: Google Earth 2010)

**Figure 4**

Existing dwelling on Lot 3.

**Figure 5**

Existing dwelling on Lot 1.

**Figure 6**

Landscape typical of southern half of the subject land.

**Figure 7**

Access to subject land from Riverina Highway.

**Figure 8**

Northern half of subject land showing absence of remnant vegetation and agricultural use.

**Figure 9**

Shed on Lot 1.

### Surrounding Area

The site is surrounded by land within Zones 1(a)(General Rural) and 1(c)(Rural Small Holdings). A portion of land in close proximity to the subject site is within Zone 6 (Open Space) and is a public reserve. To the south-west of the Riverina Highway the site is surrounded by large rural residential lots. To the north-east of the highway the site is surrounded by agricultural activities.

## 2. INTENDED OUTCOMES

The intended outcome of this planning proposal is the development of a 13 lot Community Title subdivision on the fringe of Deniliquin that will provide a rural residential living environment within a riverine environment.

## 3. EXPLANATION OF THE PROVISIONS

The Planning Proposal involves the following provisions:

- Introduction of the R5 Large Lot Residential Zone into the LEP.
- Introduction of a minimum lot size map into the LEP showing a minimum lot size of 5,000m$^2$.

- Amendment of the LEP land zoning map in accordance with the proposed zoning map shown at Attachment A.

**DRAFT Local Environmental Plan 2011(LEP)**

Council is currently preparing a draft LEP in the standard instrument format. Council will be considering the section 64 report on the draft LEP at its meeting on 7 December 2011.

The DRAFT LEP will include the land within the R5 Large Lot Residential Zone should the planning proposal proceed. The lot size map is intended to show that the minimum lot size for the R5 zone to be 1ha. The map will include blue hatching over the R5 zone which requires the reference to clause 4.1 of the LEP, with particular intention to clause 4A. The clause states:

> **4.1 Minimum subdivision lot size**
>
> (1) The objective of this clause are as follows:
>
> (a) to ensure that new subdivision reflect characteristic lot sizes and patterns in the surrounding locality,
>
> (b) to ensure that lot sizes for dwelling houses are consistent with lot sizes on adjoining lands,
>
> (c) to ensure that lot sizes have a practical and efficient layout to meet intended use,
>
> (d) to prevent the fragmentation of rural lands, and
>
> (e) to minimise intensification of development on flood affected land.
>
> (2) This clause applies to a subdivision of any land shown on the Lot Size Map that requires development consent and that is carried out after the commencement of this Plan.
>
> (3) The size of any lot resulting form subdivision of land to which this clause applies is not to be less than the minimum size shown on the Lot Size Map in relation to that land.
>
> Direction – An exception to the minim size shown on the Lots Size Map may be provided in certain circumstance, for example, in the case of land that is to be used for attached dwellings.
>
> (4) This clause doesn not apply in relation to sudivsion of individual lots in a strata plan or community title scheme.
>
> (4A) despite subclause (3), the size of any lot resulting from the subdivision of land shown on the Lot Size Map to be within Area A, must not be less than the area shown on Column 2 of the table to this subclause opposite the relevant Area, if the lot will be connected to reticulated sewer.
>
> | **Colum 1** | **Column 2** |
> |---|---|
> | Area A | 5,000m² |

The proposal is consistent with the proposed new LEP under clause 4A.

# 4. JUSTIFICATION

This section of the Planning Proposal sets out the justification for the intended outcomes and provisions, and the process for their implementation. The questions to which responses have been provided are taken from the Guide.

## 4.1 NEED FOR THE PLANNING PROPOSAL

**Is the Planning Proposal a result of any strategic study or report?**

No, although Council has committed to a Rural Residential Strategy as part of the new LEP and is within the 2011/2012 budget. The Planning Proposal has been initiated by Council following a request from the landowner.

Council has specifically requested that an analysis of the rural residential market in Deniliquin be undertaken as part of this Planning Proposal report. In the absence of a land use strategy this analysis will to some extent at least assist in an understanding of the current situation in regards to rural residential land use in Deniliquin.

The supply of any particular type of land can be divided into 'potential' supply and 'actual' supply. Potential supply is the amount of vacant land zoned for a particular purpose (in this case rural residential) or in other words, land that is available for development. Actual supply is the amount of vacant land that is 'on the market'; that is, it is developed and available for sale. These two components of supply often work independently of each as is the case for rural residential land in Deniliquin.

In regards to potential supply, Council officers have advised Council[1] that:

> …there is currently an oversupply of land zoned for rural residential purposes and that this oversupply of land is resulting in a sporadic pattern of subdivision occurring. The Committee was advised that there is approximately 961ha of land zoned for rural residential purposes and that 85% of this land has subdivision potential under the current provisions of the Deniliquin Local Environmental Plan 1997. It is estimated that this current supply of land will satisfy demand for rural residential land for at least the next 50 years.

However, simple calculations based on zone areas tend to overstate the potential supply situation because some land is:

- not available for development (i.e. not for sale or 'land banked' for the future);
- not intended for development by the owner (i.e. intend to continue with existing land uses such as commercial farming or the landowner is content with the dimensions of a larger rural residential lot despite it being capable of subdivision);
- physically constrained for development (e.g. flooding, remnant vegetation, bushfire risk, etc.);
- not financially viable for subdivision (i.e. costs exceed returns or profit is inadequate);
- constrained by infrastructure and servicing (e.g. sewer, water, roads, etc.); or
- unwanted in the market (e.g. poor location, over priced, too big/small, etc.).

For these reasons, it is possible the pending Rural Residential Strategy may conclude that some existing 1(c) zoned land be back zoned as part of an amending LEP.

In regards to actual supply, an assessment of the current market for rural residential allotments in Deniliquin based on interviews with local Real Estate agents reveals the following:

- The current supply of such lots is generally considered to be adequate although this is mostly due to the persistent dry conditions rather than any other market influence. If conditions were better then the current supply

[1] Item 3A on the agenda to the 28th October 2009 Council meeting.

would be inadequate because demand would be greater. Certainly there is consensus amongst agents that this market is not currently over supplied.

- Regardless of conditions there is always strong demand for "river blocks" because of the high levels of residential amenity they offer. A large proportion of this demand is driven by Melbourne residents who seek such an environment which is cheaper than locations on the Murray River such as Echuca/Moama.
- One agent quoted current demand for rural residential lots at one enquiry per month and one sale every three months.

From 2000 to 2011, 60 rural small holding lots have been approved, providing an average of 5.5 new lots approved each year. 39 of these newly created lots occurred between 2002 and 2003.

In summary, it is likely that there is and will continue to be strong demand for rural residential lots in locations offering high levels of residential amenity, such as riverine environments. It must be remembered that one of the main reasons people desire a rural residential environment is because of 'space' and the enhanced amenity this offers. It is considered that the apparent oversupply (in terms of potential supply) of rural residential land in Deniliquin is not grounds alone for discarding this Planning Proposal because the subject land falls into that section of the market for which there is demand.

**Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?**

The desired outcome cannot be achieved under the subdivision provisions of the current 1(a) and 1(c) zones or any other provision within the current LEP. Likewise there are no other current environmental planning instruments that would allow Council to consider the proposal. Consequently the Planning Proposal is necessary to introduce provisions into the LEP that will allow consideration of the proposed subdivision of the subject land.

**Is there a net community benefit?**

A Net Community Benefit Test of the Planning Proposal reveals:

- There would be an economic benefit to Deniliquin from the additional population the proposed lots would bring. This economic benefit translates to a community benefit through a permanent increase in spending within the local economy and less directly, the creation of employment. Works associated with the subdivision and subsequent dwelling construction also benefit the local economy and therefore the community.
- There would be a social benefit to Deniliquin from the additional population the proposed lots would bring. This social benefit is a community benefit because it presents the opportunity to increase support for community facilities such as schools and sporting clubs.
- The community would benefit from the creation of additional choice in living environments within Deniliquin. Such choice adds complexity to a community and contributes to a more interesting culture, which is seen as a desirable outcome.

- All costs associated with the Planning Proposal and subsequent subdivision will be borne by the developer, and as such there is no cost to the community.
- There will be a small loss of agricultural land resulting from the Planning Proposal, which is not a benefit to a community because the local economy is heavily dependent on this sector.

On balance, there is a net community benefit to be had from the Planning Proposal.

## 4.2 RELATIONSHIP TO STRATEGIC PLANNING FRAMEWORK

**Is the Planning Proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including exhibited draft strategies)?**

There is no adopted regional strategy applicable to the Planning Proposal.

However a draft *Murray Regional Strategy* has been prepared ("the draft Strategy") by the Department of Planning (DoP) in October 2009. The draft Strategy sets out a number of objectives and actions relating to areas such as employment, housing, transport, environment and public places. The housing target for the draft Strategy aims to cater for an extra 8,000 people across the Murray Region over the period to 2036. In this respect, the Planning Proposal is consistent with the objectives of the draft Strategy.

The draft Strategy acknowledges that "*rural lifestyle housing can help support and provide alternative housing choice for rural communities but must be planned for and managed correctly*[2]". The draft Strategy states carefully planned rural lifestyle housing can:

- provide greater housing choice for rural communities
- ensure infrastructure and servicing costs are kept to a minimum.
- reduce potential for land use conflict between farm based businesses and residents
- prevent distortions in the economic value of agricultural land
- allow for the management of natural resources and biodiversity on privately owned land
- minimise social isolation, for example, by preventing hosing in more remote areas

The Planning Proposal is generally consistent with these circumstances because:

- it provides lifestyle choice in Deniliquin
- it is on the urban fringe of Deniliquin and therefore can easily tap into existing urban infrastructure
- only land adjoining to the east is in agriculture which minimises risk of land use conflicts
- it will have no impact on the value of agricultural land
- development of the land presents an opportunity for protection of the natural environment and particularly the floodplain

[2] draft Murray Regional Strategy - DoP Oct 2009 - Page 16

- the land is not isolated and in fact will be an extension of the Deniliquin urban area

In regards to settlement and housing, the draft Strategy recognises:

> Deniliquin is the largest town in the Central Murray subregion. Projections indicate its population will be relatively stable over the next decade, with a small decline towards 2036. Local planning will need to ensure land is available for an additional 450 dwellings, including opportunities for infill development[3].

The Planning Proposal is providing the opportunity for new residential development and therefore is consistent with what the draft Strategy is seeking to achieve.

It is a requirement of the draft Strategy that zonings for rural lifestyle housing should only be undertaken in accordance with a settlement strategy approved by the Director-General. It is noted there is no such strategy in place in Deniliquin however the proposal is of a small scale a will result in a minimal increase of rural residential land in Deniliquin.

**Is the Planning Proposal consistent with the local Council's community strategic plan or other local strategic plan?**

Deniliquin does not have a strategic land use plan.

**Is the Planning Proposal consistent with applicable State Environmental Planning Policies?**

There are a number of State Environmental Planning Policies (SEPP's) relevant to the Planning Proposal.

***State Environmental Planning Policy No. 55 - Remediation of Land***

A preliminary assessment of land for potential soil contamination is required by this SEPP where Council has no knowledge of the historical use of the site, or there is knowledge that it is potentially contaminated. In this case the half of the subject land is part of the Edward River floodplain and has been used for nothing else other than grazing. The other half has been cleared of vegetation and has been used for irrigated pasture and cropping. It is also known that this part of the site has been used for a horse stud.

Based on the known history of the site, further assessment of the site is accordance with this SEPP may be required.

***State Environmental Planning Policy (Rural Lands) 2008***

Section 117 Direction 1.5 – Rural Lands requires that when a council prepares an LEP (Planning Proposal) for land within a rural or environment protection zone it needs to be consistent with the rural planning principles listed in clause 7 of the SEPP. These principles are as follows:

(a) the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas,

(b) recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State,

(c) recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development,

[3] ibid - page 19

(d) in planning for rural lands, to balance the social, economic and environmental interests of the community,

(e) the identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land,

(f) the provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities,

(g) the consideration of impacts on services and infrastructure and appropriate location when providing for rural housing,

(h) ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General.

An assessment of the Planning Proposal against these principles reveals the following:

- The Planning Proposal does not promote or protect existing agricultural land because when developed the land will cease to be used for agriculture. It is noted however that (in the absence of irrigation) the land is rated as Category IV in the Department of Natural Resources Land Capability mapping. The definition given for Category IV lands is as follows:

  > Class IV - Soil conservation practices such as pasture improvement, stock control, application of fertiliser and minimal cultivation for the establishment or re-establishment of permanent pasture. Land not suitable for cultivation on a regular basis owing to limitations of slope gradient, soil erosion, shallowness or rockiness, climate, or a combination of these factors. Comprises the better classes of grazing land of the State and can be cultivated for an occasional crop, particularly a fodder crop or for pasture renewal. Not suited to the range of agricultural uses listed for Classes I to III. If used for "hobby farms" adequate provision should be made for water supply, effluent disposal, and selection of safe building sites and access roads.

  This classification confirms that the subject land is not 'prime' agricultural land.

- The trend is for larger agricultural holdings and as such the area of the subject land less and less relevant to agriculture. In addition, the location of the subject land on the immediate fringe of the Deniliquin urban area deems it less suitable for commercial farming activities as it may result in land use conflicts.

- The economic and social benefits of retaining the land in agriculture are outweighed in this instance by the overall benefit to the Deniliquin community.

- There is potential for the subdivision of the subject land to result in less protection for the riverine environment through multiple land ownership and different attitudes. However, there is also potential for protection to be enhanced if the subject land is not responsibly managed in its existing configuration.

- The Planning Proposal is an ideal opportunity for rural lifestyle given its location adjacent to the Deniliquin township and the high residential amenity offered by the riverine environment.

- The opportunity exists for the subject land to take advantage of the proximity of urban infrastructure.

- The influence of the regional strategy on the Planning Proposal is addressed in the previous section.

On balance, the Planning Proposal is considered to satisfy the Rural Planning Principles as the benefits outweigh the loss of a small amount of average quality agricultural land.

***Murray Regional Environmental Plan No. 2 – Riverine Land***

This REP is now deemed to be a SEPP for the purposes of the EP&A Act. The aims of the REP are to conserve and enhance the riverine environment of the River Murray for all users. This environment includes all waterways, river beds and banks, associated tributaries, wetlands and water bodies (including the Edward River).

The REP requires at clause 4 for Council to consider the objectives and planning principles expressed in it when preparing an LEP. The specific principles in the REP applicable to the Planning Proposal include access, bank disturbance, flooding, land degradation, landscape, river related uses and water quality.

- The waterway and much of the foreshore of the River Murray is a public resource. Alienation or obstruction of this resource by or for private purposes should not be supported.
- Development along the main channel of the River Murray should be for public purposes. Moorings in the main channel should be for the purposes of short stay occupation only.
- Human and stock access to the River Murray should be managed to minimise the adverse impacts of uncontrolled access on the stability of the bank and vegetation growth.
- Disturbance to the shape of the bank and riparian vegetation should be kept to a minimum in any development of riverfront land.
- Where land is subject to inundation by floodwater:
  - (a) the benefits to riverine ecosystems of periodic flooding,
  - (b) the hazard risks involved in developing that land,
  - (c) the redistributive effect of the proposed development on floodwater,
  - (d) the availability of other suitable land in the locality not liable to flooding,
  - (e) the availability of flood free access for essential facilities and services,
  - (f) the pollution threat represented by any development in the event of a flood,
  - (g) the cumulative effect of the proposed development on the behaviour of floodwater, and
  - (h) the cost of providing emergency services and replacing infrastructure in the event of a flood.
- Flood mitigation works constructed to protect new urban development should be designed and maintained to meet the technical specifications of the Department of Water Resources.
- Development should seek to avoid land degradation processes such as erosion, native vegetation decline, pollution of ground or surface water, groundwater accession, salination and soil acidity, and adverse effects on the quality of terrestrial and aquatic habitats.
- Measures should be taken to protect and enhance the riverine landscape by maintaining native vegetation along the riverbank and adjacent land, rehabilitating degraded sites and stabilising and revegetating riverbanks with appropriate species.
- Only development which has a demonstrated, essential relationship with the river Murray should be located in or on land adjacent to the River Murray. Other development should be set well back from the bank of the River Murray.

- Development which would intensify the use of riverside land should provide public access to the foreshore.
- New or expanding settlements (including rural-residential subdivision, tourism and recreational development) should be located:
  (a) on flood free land,
  (b) close to existing services and facilities, and
  (c) on land that does not compromise the potential of prime crop and pasture land to produce food or fibre.
- All decisions affecting the use or management of riverine land should seek to reduce pollution caused by salts and nutrients entering the River Murray and otherwise improve the quality of water in the River Murray.
- Wetlands are a natural resource which have ecological, recreational, economic, flood storage and nutrient and pollutant filtering values. Land use and management decisions affecting wetlands should:
  (a) provide for a hydrological regime appropriate for the maintenance or restoration of the productive capacity of the wetland,
  (b) consider the potential impact of surrounding land uses and incorporate measures such as a vegetated buffer which mitigate against any adverse effects,
  (c) control human and animal access, and
  (d) conserve native plants and animals.

An assessment of the Planning Proposal against these principles reveals the following:

- The subject land already extends to the Edward River and as such the proposal does not affect existing public access. Providing public access to the river is an option for the developer of the land once rezoned. The developer has indicated that he is prepared to dedicate some river front land to Council as public reserve and prior to the dedication undertake enhancement on this land.
- It is likely the grazing of the subject land will cease with the Planning Proposal and as damage by any existing stock access to the Edward River and use of the floodplain will cease.
- The Planning Proposal will result in some disturbance to the floodplain although building setbacks from the river itself will ensure disturbance to the bank is minimised.
- The current LEP shows more than half of the subject land is subject to flooding from the Edward River. Following the Gateway further investigations may be required in regards to flooding.
- Mitigation measures such as building heights can reduce the impacts of flooding.
- The risk of land degradation resulting from the Planning Proposal will depend almost entirely on the activities of those persons occupying the land.
- The creation of a number of lots within the floodplain will be detrimental to the riverine landscape as it will introduce additional dwellings and associated works and structures into an environment where just one building currently exists (on the floodplain). The effect on the riverine landscape will largely depend on the distance of buildings to the river and the design of buildings

constructed. Any vegetation removal from the floodplain will be detrimental to the landscape.

- Some of the development envisaged by the Planning Proposal cannot be undertaken on flood-free land, which contravenes one of the REP principles. However the subject land is close to the urban services and facilities offered by the Deniliquin township.
- The subject land is not 'prime' agricultural land (see above).
- There is potential for water quality within the river to be detrimentally affected by the Planning Proposal if stormwater discharges from the subject land are not managed. This is a development matter and there are ways and means of ensuring stormwater is adequately 'treated' before discharge.
- A wetland exists within the floodplain in the southern part of the subject land. This has the potential to assist in stormwater management as well as be maintained as a benefit to the environment.

In conclusion, whilst the Planning Proposal can satisfy some of the planning principles expressed in the REP, it performs poorly against others and particularly in regards to flooding, however post Gateway further investigation can be undertaken in regards to flooding and mitigation measures can be undertaken to ensure flooding issues are addressed.

***Other State Environment Planning Policies***

All State Environment Planning Policies were considered as part of the planning proposal. With exception of the SEPPs listed above, no other SEPPS provided direction or were applicable in regards to the proposed rezoning.

**Is the Planning Proposal consistent with applicable Ministerial Directions (S.117 Directions)?**

Section 117 of the EP&A Act allows the Minister for Planning to give directions to Councils regarding the principles, aims, objectives or policies to be achieved or given effect to in the preparation of draft LEPs. A Planning Proposal needs to be consistent with the requirements of the Direction but can be inconsistent if justified using the criteria stipulated such as a Local Environmental Study or the proposal is of "minor significance". Those S117 Directions considered relevant to this Planning Proposal are as follows:

***1.2 Rural Zones***

This Direction is applicable because the Planning Proposal proposes changes to the existing rural zone.

The proposal is inconsistent with the Direction as it does not allow the rezoning of rural land however the proposed rezoning will result in a minimal loss of agricultural land, it has already been concluded that the overall community benefit outweighs this concern (see above). The land to be removed from rural zone will have a minimal impact on the agricultural industries in Deniliquin due to the small size of land to be removed.

The inconsistency is justified on the grounds that the Planning Proposal is of minor significance within the context of rural land and zoning. The subject land to be

rezoned is minimal and has limited agricultural significance and close proximity to residential dwellings.

***1.3 Minim, Petroleum Production and Extractive Industries***

This Direction is applicable because the Planning Proposal will restrict the potential development of land resources as the proposed land use will be incompatible with such development.

The planning proposal is consistent with this Direction because there are no known land resources on the subject land or surrounding land. The proposal has is unlikely to lead to any land use conflict from the development of any land resources as due to the nature and scale of the proposal and that it is unlikely that any land resources occur in the area.

***1.5 Rural Lands***

This Direction is applicable because the Planning Proposal affects land within an existing rural zone.

The Planning Proposal is consistent with this Direction because it generally satisfies the Rural Planning Principles expressed in the SEPP (Rural Lands)(see above).

***3.1 Residential Zones***

This Direction is applicable because the proposal is to include the land within R5 (a residential zone).

The planning proposal is consistent with this direction. The proposal seeks to encourage variety and choice of housing types to provide for existing and future housing needs in Deniliquin. It will make efficient use of existing infrastructure and has a minimal impact of the environment and resource lands.

***3.4 Integrating Land Use and Transport***

This Direction is applicable because it proposes to create an urban zoning over the subject site.

The planning proposal is consistent with this direction as it is of minor significance and the nature and scale of the proposal will only result in a minimal impacts traffic and transport in the area.

***4.3 Flood Prone Land***

This Direction is applicable because parts of the subject land are identified in the LEP as flood prone.

This Direction prohibits rezoning flood prone land from rural to urban and therefore the Planning Proposal is inconsistent however the proposal includes low density residential development and associated infrastructure and the nature and scale of the development is considered to be of a minor significance.

An investigation into the flood levels of the site has been undertaken. Council has agreed that the 1% AEP flood is 92.84 AHD level for the subject land and that the 1 in 20 year flood is 92.12 AHD which is why the subject land is mapped as flood liable in the LEP. The investigation illustrated that to meet Councils current policy the floor level of any habitable building on the site of 92.94 meters or alternatively provide flood protection in other ways.

The proposal is of minor significance and mitigation measures can addressed the flooding issues.

***4.4 Planning for Bushfire Protection***

This Direction is applicable because the subject land includes land that is mapped as bushfire prone. The bushfire map shows the subject land as being category 1 vegetation and is affected by a variable vegetation buffer of either 30m or 100m. The site is generally flat, with parts been cleared for cropping.

The Planning Proposal does not propose to introduce the specific provisions required by this Direction. In accordance with the Direction and upon receipt of a positive gateway determination, Council will consult with the RFS to satisfy the Direction the RFS will need to sign off on the suitability of the change of land use.

***6.2 Reserving Land for Public Purposes***

This Direction is applicable because the RTA have advised that the subject land will be affected as the highway is to be widened.

The Planning Proposal proposes to facilitate the Direction by facilitating land reserved for public purposes. This issue is being addressed in the standard instrument draft LEP.

## 4.3 ENVIRONMENTAL, SOCIAL & ECONOMIC IMPACT

**Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?**

Biodiversity mapping from the then Department of Environment Climate Change and Water (DECCW) indicates part of the subject land (the floodplain) is 'floodplain wetland'. A small portion of the subject site is identified as floodplain wetland, the proposed subdivision has been designed to ensure the area is maintained in one lot and any impacts to the area are minimised.

The presence of any potentially threatened habitat or species is not known and no information in this regard was submitted with the request for rezoning. Following a positive gateway determination an assessment would be undertaken to determine any potential habitat or species on the site.

The draft standard instrument LEP does not identify the majority of the subject land as having biodiversity significance.

**Are there any other likely environmental effects as a result of the Planning Proposal and how are they proposed to be managed?**

Any potential environmental impacts will stem from the development of the subject land once it is rezoned. These are matters for any development application made for the subject land. There is no reason that subject to compliance with the application requirements of the EP&A Act and assessment by Council under Section 79C that development could not be undertaken on the subject land without impacting significantly on the environment.

**How has the Planning Proposal adequately addressed any social and economic effects?**

The social and economic benefits of the Planning Proposal are considered to be positive (see assessment earlier in the report). They are also minor matters for consideration having regard for the circumstances of what is proposed.

### 4.4 STATE & COMMONWEALTH INTERESTS

**Is there adequate public infrastructure for the Planning Proposal?**

The Guide states this question only requires consideration for proposal resulting in excess of 150 residential lots being created. Consequently it is not relevant to this Planning Proposal.

**What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?**

Subject to the requirement of the gateway determination, Council intends consulting with the appro

## 5. COMMUNITY CONSULTATION

There has not been any community consultation to date for the Planning Proposal. Once the gateway determination is complete, the proposal will be publicly exhibited. The public exhibition would be undertaken for a minimum of 28 days and would be notified in the local media with information available on Council's website. Adjoining owners would be notified of the Planning Proposal.

## 6. CONCLUSION

Council has resolved to support a Planning Proposal for the rezoning of rural land on the eastern urban fringe of Deniliquin for the purposes of rural residential development. The location of the subject land within the context of Deniliquin and the high levels of residential amenity offered by the proximity of a riverine environment are strong factors in support of the Planning Proposal.

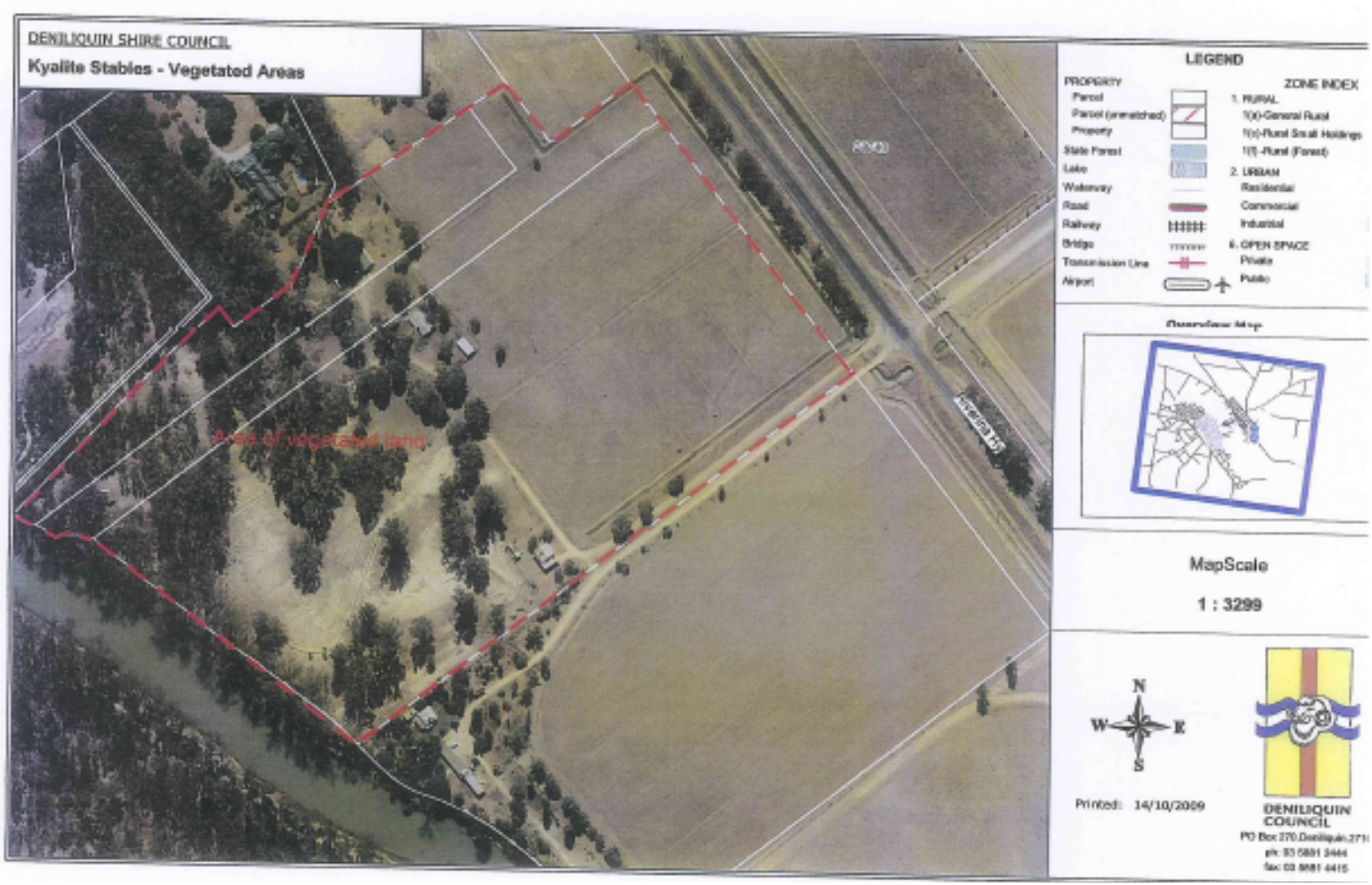
It is likely that there is and will continue to be strong demand for rural residential lots and the proposal provides diversity in lifestyle choice in Deniliquin. The subject land is on the urban fringe of Deniliquin and therefore is orderly development which can tap into existing urban infrastructure.

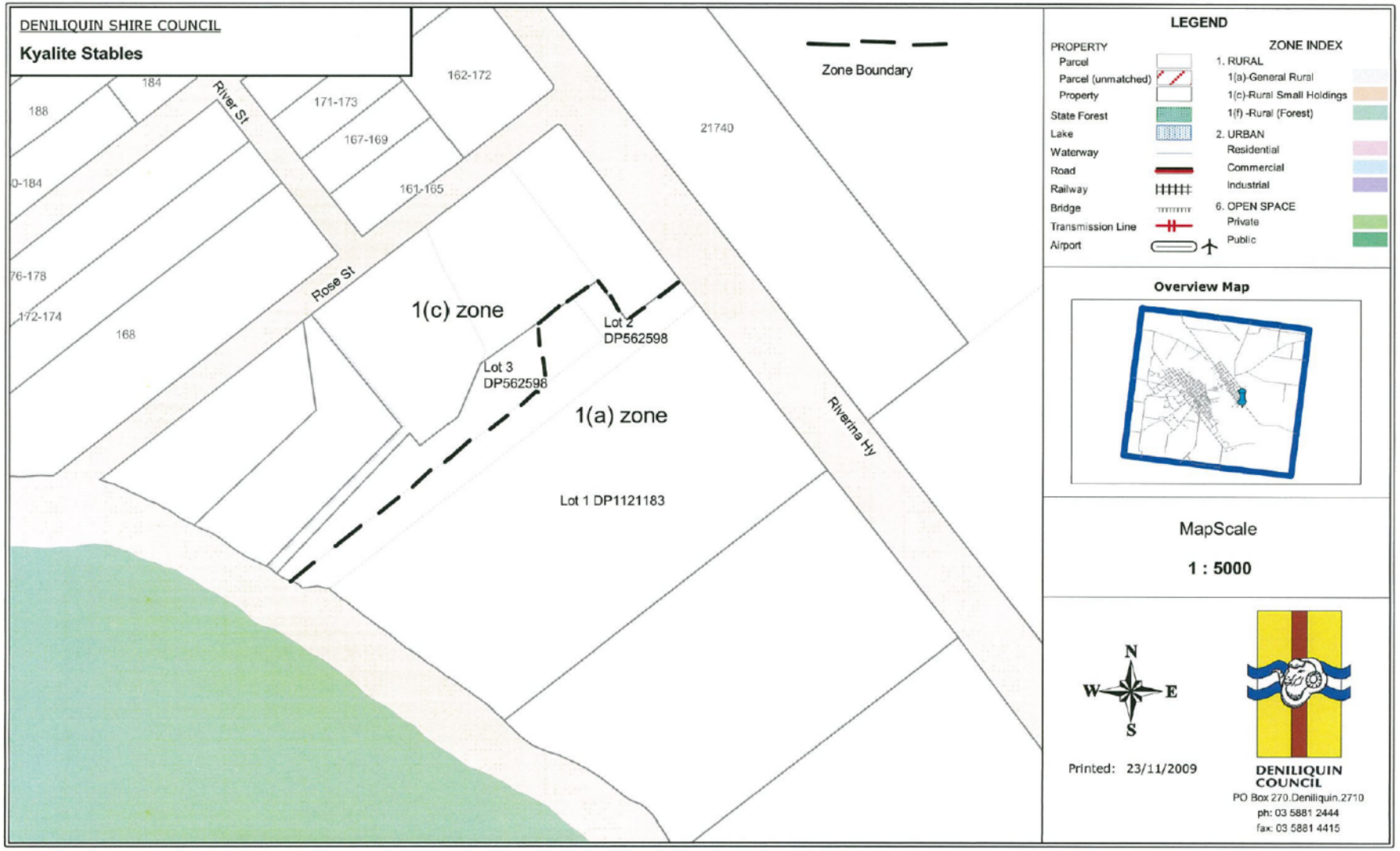
Although the subject land has been identified as flood prone further investigation into this issue will be completed following the Gateway process.

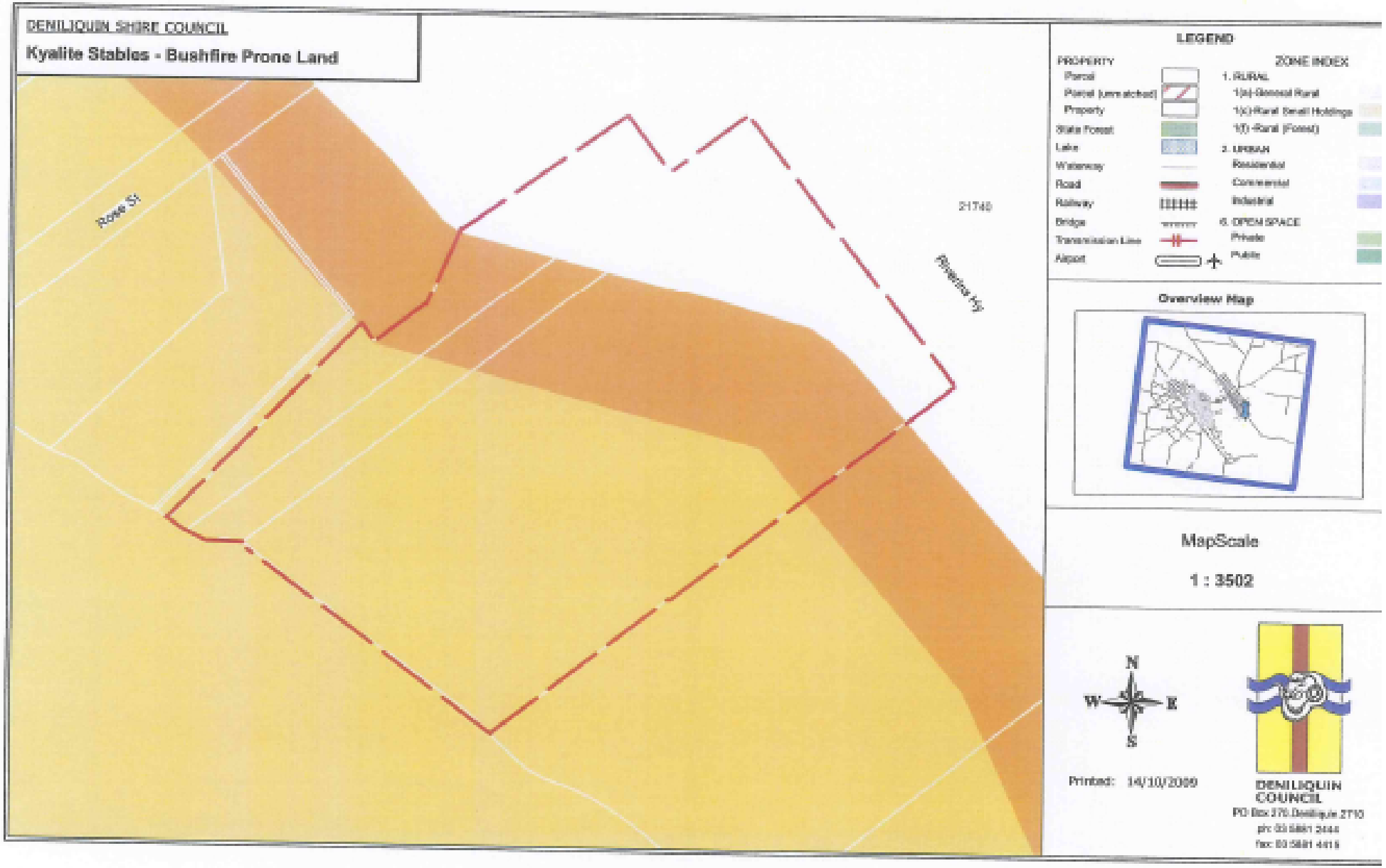
The planning proposal will provide economic and social benefits to Deniliquin with minimal impacts on agricultural land and therefore is worthy of supporting for change in zoning to facilitate rural residential development.

**APPENDIX A**

Subject Land


DENILIQUIN SHIRE COUNCIL
Kyalite Stables - Vegetated Areas
Area of vegetated land
LEGEND
PROPERTY
Parcel
Parcel (unmatched)
Property
State Forest
Lake
Waterway
Road
Railway
Bridge
Transmission Line
Airport
ZONE INDEX
1. RURAL
1(a)-General Rural
1(c)-Rural Small Holdings
1(f) -Rural (Forest)
2. URBAN
Residential
Commercial
Industrial
6. OPEN SPACE
Private
Public
MapScale
1 : 3299
N
W
E
S
Printed: 14/10/2009
DENILIQUIN COUNCIL


DENILIQUIN SHIRE COUNCIL
Kyalite Stables
Zone Boundary
River St
Rose St
Riverina Hy
1(c) zone
1(a) zone
Lot 2
DP562598
Lot 3
DP562598
Lot 1 DP1121183
162-172
171-173
167-169
161-165
21740
188
184
0-184
76-178
172-174
168
LEGEND
PROPERTY
Parcel
Parcel (unmatched)
Property
State Forest
Lake
Waterway
Road
Railway
Bridge
Transmission Line
Airport
ZONE INDEX
1. RURAL
1(a)-General Rural
1(c)-Rural Small Holdings
1(f) -Rural (Forest)
2. URBAN
Residential
Commercial
Industrial
6. OPEN SPACE
Private
Public
Overview Map
MapScale
1 : 5000
N
W
E
S
Printed: 23/11/2009
DENILIQUIN COUNCIL
PO Box 270.Deniliquin.2710
ph: 03 5881 2444
fax: 03 5881 4415


DENILIQUIN SHIRE COUNCIL
Kyalite Stables - Bushfire Prone Land
Rowe St
21748
Riverina Hwy
LEGEND
PROPERTY
Parcel
Parcel (unattached)
Property
State Forest
Lake
Waterway
Road
Railway
Bridge
Transmission Line
Airport
ZONE INDEX
1. RURAL
1(a)-General Rural
1(c)-Rural Small Holdings
1(f) -Rural (Forest)
2. URBAN
Residential
Commercial
Industrial
6. OPEN SPACE
Private
Public
Overview Map
MapScale
1 : 3502
N
W
E
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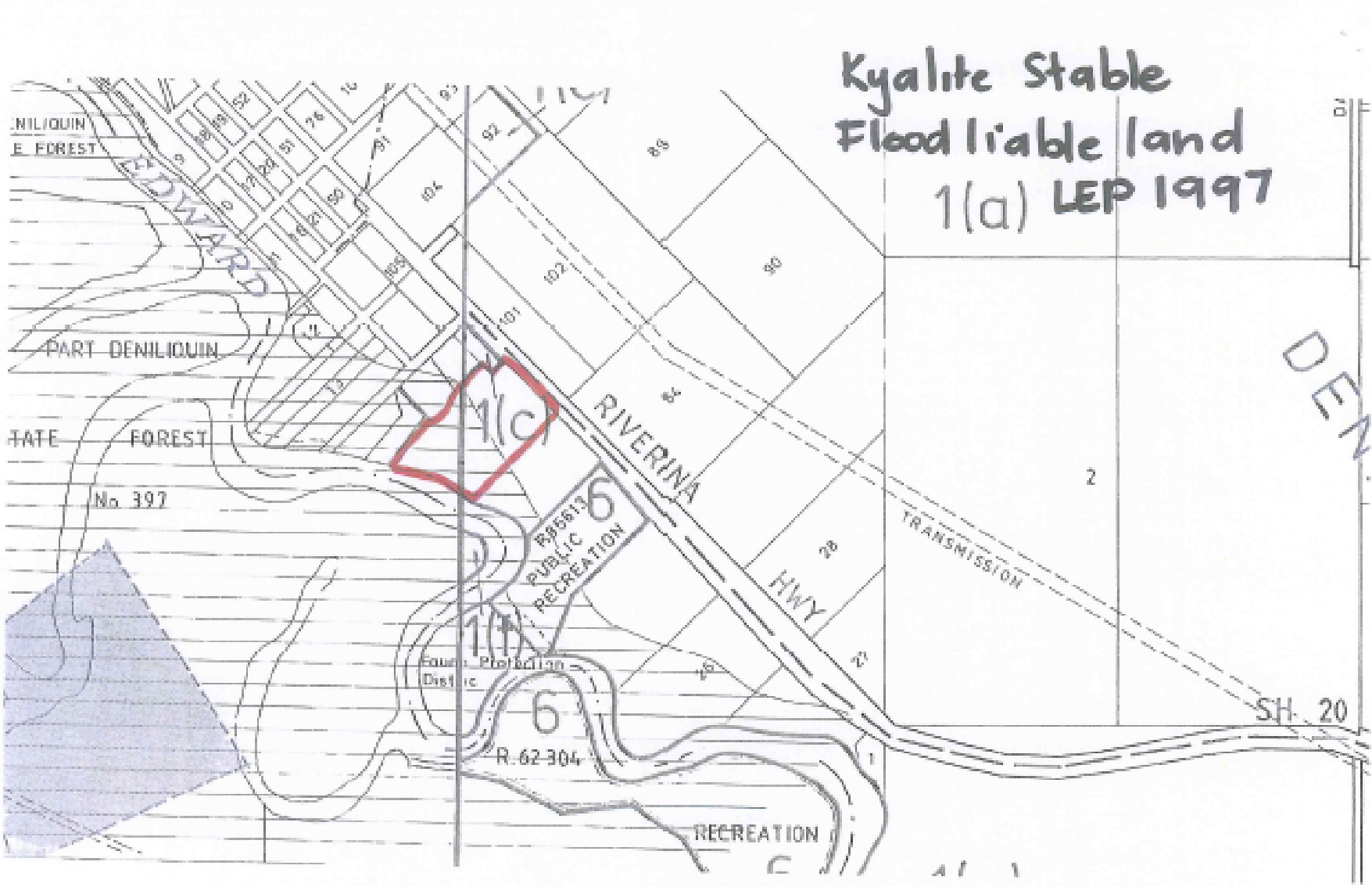
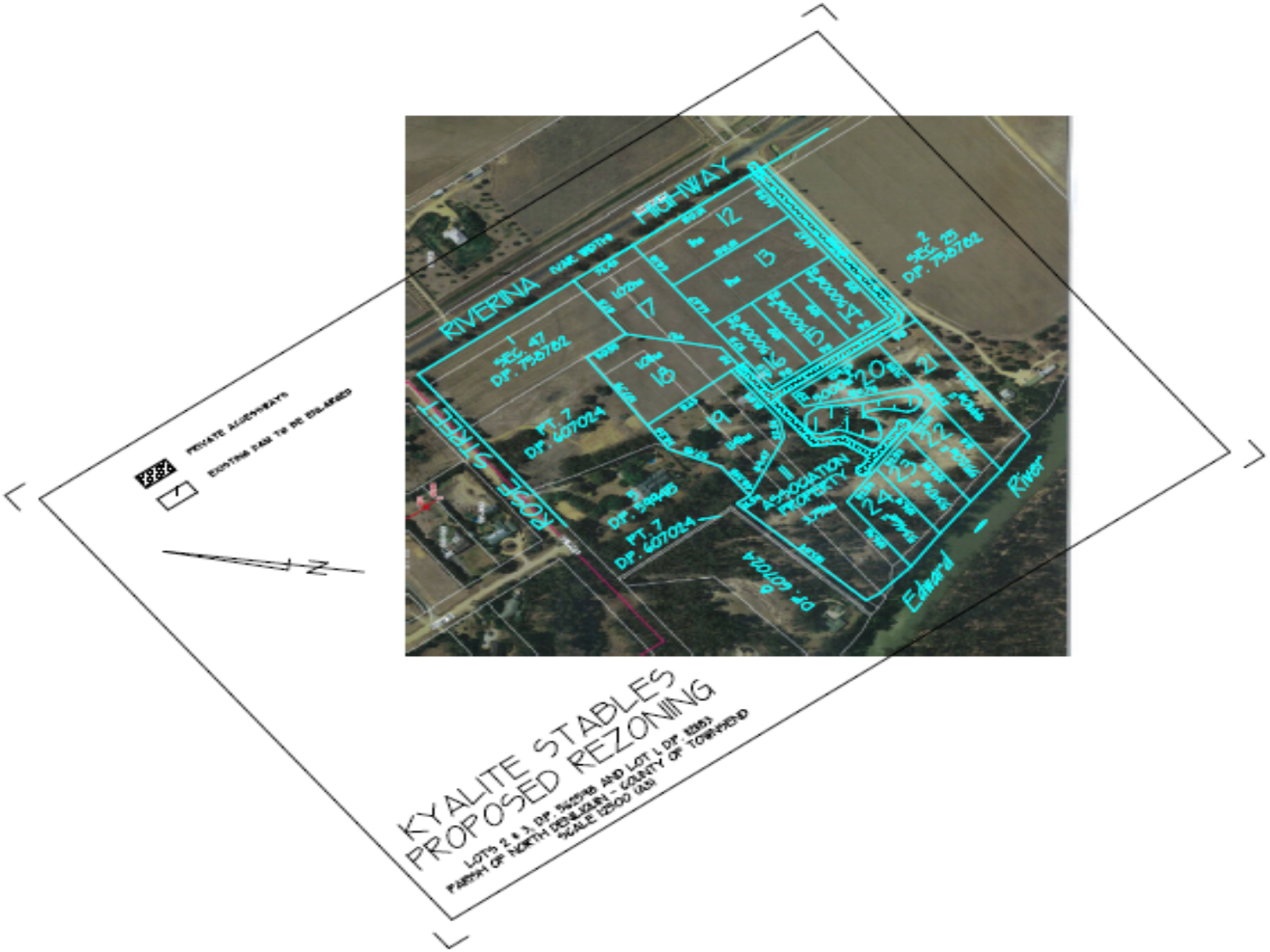
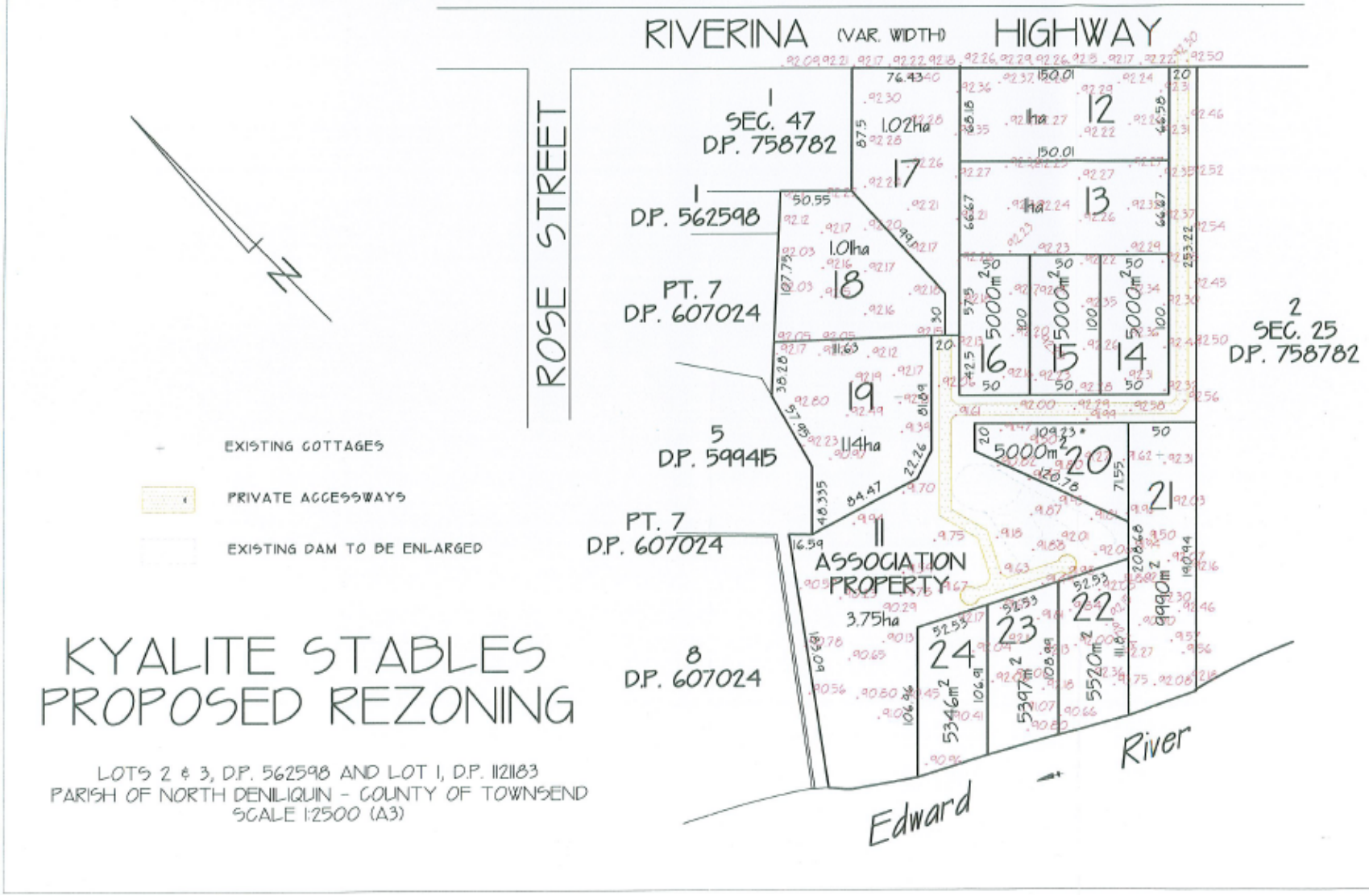
Printed: 14/10/2009
DENILIQUIN COUNCIL
PO Box 270 Deniliquin 2710
ph: 03 5881 2444
fax: 03 5881 4416


Kyalite Stable
Flood liable land
1(a) LEP 1997
EDWARD
PART DENILIQUIN
TATE FOREST
No. 397
1(c)
RIVERINA
HWY
TRANSMISSION
R85613
PUBLIC RECREATION
1(f)
R.62304
RECREATION
SH. 20
DEN


PRIVATE ALLEYWAYS
EXISTING DAM TO BE ENLARGED
HIGHWAY
RIVERINA
SCALE: WIDTH
SEC. 47
DP. 758762
PT. 7
DP. 407024
SEC. 23
DP. 758762
PT. 7
DP. 407024
ASSOCIATION PROPERTY
Edward
River
KYALITE STABLES
PROPOSED REZONING
LOTS 2 & 3 DP. 545598 AND LOT 1 DP. 82857
PARISH OF NORTH DENILIQUIN - COUNTY OF TOWNSEND
SCALE 12500 (A3)

## APPENDIX B

Survey Plan with levels




# KYALITE STABLES
# PROPOSED REZONING

LOTS 2 & 3, D.P. 562598 AND LOT 1, D.P. 1121183
PARISH OF NORTH DENILIQUIN - COUNTY OF TOWNSEND
SCALE 1:2500 (A3)

# Appendix 2

**Gateway Determination**

NSW GOVERNMENT Planning & Infrastructure

Contact: Robert Bisley
Phone: (02) 6841 2180
Fax: (02) 6884 8483
Email: Robert.Bisley@planning.nsw.gov.au
Postal: PO Box 58, Dubbo NSW 2830

Our ref: PP_2012_DENIL_001_00 (12/01723-1)

Mr Des Bilske
General Manager
Deniliquin Council
PO Box 270
DENILIQUIN NSW 2710

Dear Mr Bilske,

**Planning Proposal to rezone rural land on the Riverina Highway at Deniliquin from 1(a) General Rural Zone to 1(c) Rural Small Holding Zone**

I am writing in response to your Council's letter requesting a Gateway Determination under section 56 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") for a planning proposal to amend the Deniliquin Local Environmental Plan 1997 to rezone rural land on the Riverina Highway at Deniliquin from 1(a) General Rural Zone to 1(c) Rural Small Holding Zone

As delegate of the Minister for Planning and Infrastructure, I have now determined that the planning proposal should proceed subject to the conditions in the attached Gateway determination.

It is noted that Council has recently committed to prepare a Rural Residential Strategy related to the supply of rural residential land across the entire local government area. Council is encouraged to expedite preparation of the strategy and submit the adopted version to the department for endorsement.

The amending Local Environmental Plan (LEP) is to be finalised within 9 months of the week following the date of the Gateway determination. Council should aim to commence the exhibition of the planning proposal within four (4) weeks from the week following this determination. Council's request for the department to draft and finalise the LEP should be made six (6) weeks prior to the projected publication date.

The NSW State Government is committed to reducing the time taken to complete LEPs by tailoring the steps in the process to the complexity of the proposal, and by providing clear and publicly available justification for each plan at an early stage. In order to meet these commitments, the Minister may take action under s54(2)(d) of the EP&A Act if the time frames outlined in this determination are not met.

Should you have any queries in regard to this matter, please contact Robert Bisley of the Regional Office of the Department on 02 6841 2180.

Yours sincerely,

25/10/12

**Richard Pearson**
**A/Director-General**

NSW GOVERNMENT | Planning & Infrastructure

# Gateway Determination

***Planning Proposal (Department Ref: PP_2012_DENIL_001_00)**: to rezone rural land on the Riverina Highway at Deniliquin from 1(a) General Rural Zone to 1(c) Rural Small Holding Zone.*

I, the Acting Director General, Department of Planning and Infrastructure as delegate of the Minister for Planning and Infrastructure, have determined under section 56(2) of the EP&A Act that an amendment to the Deniliquin Local Environmental Plan 1997 to rezone rural land on the Riverina Highway at Deniliquin from 1(a) General Rural Zone to 1(c) Rural Small Holding Zone should proceed subject to the following conditions:

1. The planning proposal is inconsistent with S117 Directions 1.2 Rural Zones, 1.5 Rural Lands and 2.1 Environmental Protection Zones. Council is to address these inconsistencies and demonstrate how it intends to facilitate the protection and conservation of environmentally sensitive land.

2. Council is to demonstrate that the planning proposal satisfies the requirements of State Environmental Planning Policy No 55 (SEPP 55) – Remediation of Land and the *Contaminated Land Planning Guidelines*. Council is to prepare an initial site contamination investigation to demonstrate that the site is suitable for rezoning to the proposed zone. This report is to be included as part of the public exhibition material.

3. Council is to address the following specific principles of Clause 10 of the Murray Regional Environmental Plan No. 2 – Riverine Land (MREP), which applies to the planning proposal as the proposed future land use will affect the riverine environment of the River Murray:

    - Bank disturbance,
    - Flooding,
    - Land degradation,
    - River related uses,
    - Settlement, and
    - Wetlands.

4. Following the completion of the work required by conditions 1-3 above and prior to the commencement of public exhibition, Council is to amend the planning proposal where necessary and provide a copy of the revised proposal and associated relevant information to the department's regional team.

5. Community consultation is required under sections 56(2)(c) and 57 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") as follows:

    (a) the planning proposal must be made publicly available for **28 days**; and
    (b) the relevant planning authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in section 4.5 of *A Guide to Preparing LEPs (Department of Planning 2009)*.

NSW GOVERNMENT | Planning & Infrastructure

6. Consultation is required with the following public authorities under section 56(2)(d) of the EP&A Act:

- Commonwealth Civil Aviation safety Authority
- Murray Catchment Management Authority
- NSW Department of Primary Industries – Agriculture
- NSW Department of Primary Industries – Minerals and Petroleum
- Office of Environment and Heritage – Flooding; and NSW National Parks and Wildlife Service
- NSW Rural Fire Service
- Transport for NSW – Roads and Maritime Services

Each public authority is to be provided with a copy of the planning proposal and any relevant supporting material. Each public authority is to be given at least 21 days to comment on the proposal, or to indicate that they will require additional time to comment on the proposal. Public authorities may request additional information or additional matters to be addressed in the planning proposal.

7. Further to Condition 5 above, and prior to the commencement of public exhibition:

(a) Council is to consult with the Director-General of the Department of Primary Industries as per the requirements of S117 Direction 1.3 Mining, Petroleum and Extractive Industries. Council is to amend the planning proposal, if necessary, to take into consideration any comments made,
(b) Council is to consult with the Commonwealth Civil Aviation Authority as per the requirements of S117 Direction 3.5 Development Near Licensed Aerodromes. Council is to amend the planning proposal, if necessary, to take into consideration any comments made,
(c) Council is to consult with the Commissioner of the NSW Rural Fire Service as per the requirements of S117 Direction 4.4 Planning for Bushfire Protection. Council is to amend the planning proposal, if necessary, to take into consideration any comments made,
(d) Council is to consult the Office of Environment and Heritage as the site is below the 1:100 FPL and parts are also known to be in the high hazard floodway. Council is to demonstrate consistency with the requirements of S117 Direction 4.3 Flood Prone Land given the inconsistencies with the NSW Flood Prone Land Policy and the principles of the Floodplain Development manual, and
(e) Council is to consult with Roads and Maritime Services in relation road widening identified for land adjoining the Riverina Highway. Council is to amend the planning proposal, if necessary, to take into consideration any comments made and further address the requirements of S117 Direction 6.2 Reserving Land for Public Purposes.

NSW GOVERNMENT | Planning & Infrastructure

8. A public hearing is not required to be held into the matter by any person or body under section 56(2)(e) of the EP&A Act. This does not discharge Council from any obligation it may otherwise have to conduct a public hearing (for example, in response to a submission or if reclassifying land).

9. The timeframe for completing the LEP is to be **9 months** from the week following the date of the Gateway determination.

Dated 25 day of October 2012.

**Richard Pearson**
**A/Director-General**
**Delegate of the Minister for Planning and Infrastructure**

# Appendix 3

**Responses from Government Agencies**

**Australian Government**

**Civil Aviation Safety Authority**



OFFICE OF THE DIRECTOR OF AVIATION SAFETY

*Trim Ref: GI12/1224*

7 December 2012

Ms Julie Rogers
Manager Environmental Services
Deniliquin Council
PO Box 270
DENILIQUIN NSW 2710

Dear Ms Rogers

I acknowledge receipt of your letter of 20 November 2012 addressed to the Civil Aviation Safety Authority (CASA) regarding the Kyalite Stables Planning Proposal.

I have been advised that CASA has no jurisdiction over local land use planning. However Council may wish to take into account the following comments with regard to aviation safety:

- Deniliquin City Council should confirm that the development falls outside the Obstacle Limitation Surface and PANS-OPS airspace.
- Sensible cladding material should be used during construction and external lights should be shielded below the horizontal to minimise glare and possible effects on pilots.

I trust this information is of assistance.

Yours sincerely

Carolyn Hutton
Manager
Corporate Relations Branch

GPO Box 2005 Canberra ACT 2601 Telephone: (02) 6217 1390 Facsimile: (02) 6217 1209

NSW GOVERNMENT | Office of Environment & Heritage

Your ref JR
Our reference: DOC12/48132
Contact: Miles Boak 6229 7095

General Manager
Deniliquin Council
PO Box 270
Deniliquin NSW 2710

Dear Sir,

**Re Planning Proposal –Kyalite Stables, Riverina Highway, Deniliquin**

I refer to your letter of 20 November 2012 seeking comments from the Office of Environment and Heritage (OEH) on the above proposal to rezone the land from 1(a) General Rural to 1(c) Rural Small Holding under Deniliquin Local Environmental Plan 1997. Thank you for providing the OEH with the opportunity to comment on the proposal and the accompanying assessment documents required at the gateway determination stage.

OEH does not support the Planning Proposal for the southern half of the subject land. The proposed subdivision design should be amended to delete the proposed Lots 21-24 section of the proposed subdivision design or the river frontage small lots. Also, the proposed zoning or lot size maps for the southern half of the site should be amended accordingly; a lot size of 5,000m2 is inappropriate for this area, and should be increased to 2 Ha.

Protection of the riparian corridor fronting the Edward River which contains red river gum community and associated wetland/depressions is not seen as compatible with small lot subdivision 5000m2 subdivision. Regional planning considerations from the Murray Regional Environmental Plan No 2—Riverine Land and the Draft Murray Regional Strategy emphasise the threat urban development poses to naturally vegetated riparian corridors. These important areas provide a range of benefits such as stabilising banks, maintaining water quality, providing habitat for native species and ecological communities and visual amenity (Page 37 Draft Murray Regional Strategy October 2009). Small lot subdivision within the riverine corridor is not seen as consistent with regional objectives.

Detailed comments and justification of OEH's response to the Planning Proposal are included at **Attachment A.** OEH considers that the matters set out in the Attachment need to be fully considered before the Planning Proposal is approved, as it is not considered adequately justified at the current time.

If you require further information please contact Miles Boak, Conservation Planning Officer, on 02 6229 7095

Yours sincerely

M Sheahan 12/12/2012

Mark Sheahan
A/ Manager Landscape & Aboriginal Heritage Protection
**Conservation & Regulation Division – South**

PO Box 733 Queanbeyan NSW 2620
11 Farrer Place Queanbeyan NSW
Tel: (02) 6229 7002 Fax: (02) 6229 7006
ABN 30 841 387 271
www.environment.nsw.gov.au

## ATTACHMENT A

### Flooding Comments

The Planning Proposal and associated documents have been reviewed by the OEH Inland Flood Unit, and comments provided below. Council needs to confirm that the potential impact of proposed rezoning will be of "minor significance" for the flood prone section of the land for the rezoning to proceed.

Currently there is an updated Flood Study being prepared for Deniliquin Council which should provide additional information to inform the LEP, allow more accurate mapping of the flood hazard, and set revised Flood Planning Levels (FPL) for residential development. Funding for the study has been provided from OEH through the 2012/13 Flood Grants Program

This Flood Study is still some months away from being completed, so the comments below should only be considered as preliminary.

Although half the land is considered relatively high, the map included at page 25 of the Planning Proposal suggests that in the 1% flood event, water would cover this land, albeit at a shallow depth. Therefore, one of the main issues for Council to tackle is the flood level policy. The current Deniliquin Flood Policy sets a FPL at 0.1m above the 1% flood level, but this is in contravention of current planning advice which stipulates that the FPL should be 0.5m above the 1% flood level.

It could be construed that proposed works are of 'minor significance' on the higher ground, but the issue of the correct FPL needs to be addressed before this proposed re-zoning can be determined.

If approval were to be granted, Council will need to set conditions that are compatible with the flood hazard of the land, and be satisfied that the proposed re-zoning is of 'minor significance' in accordance with local Planning direction 4.3 (flood prone land). However, OEH cannot make more definitive comments until such time that Council:

- Completes its Flood Study
- Reviews its FPA/FPL for the area
- Considers any cumulative impacts and the impacts on neighbouring properties

For further information Peter Nankivell OEH Senior Natural Resource Officer (Floodplain) can be contacted on (03) 58983934.

### Aboriginal Cultural heritage

OEH notes that a database search has been conducted of the subject area, and no Aboriginal objects were recorded on AHIMS. However, The AHIMS database does not contain a record of all Aboriginal objects and sites in NSW, and, the landscape position of the site would indicate that the site has high archaeological potential.

For the purposes of rezoning this area to Rural Small Holdings, an on-ground cultural heritage survey of the area should also be conducted. An on-ground cultural heritage survey will allow a more informed decision to be made on the suitability of the land to be rezoned from a cultural heritage viewpoint.

Further information on the conduct of cultural heritage surveys can be found at http://www.environment.nsw.gov.au/licences/achregulation.htm

**Impact on Adjoining National park**

As a development adjoining OEH owned land on the opposite bank of the Edward River (in this case Murray Valley Regional Park – Deniliquin precinct), the development of this rural residential subdivision has the potential to:

- Lead to impacts on the vegetation surrounding the reserve;
- Impact visually upon the landscape where the construction of dwellings, sheds or other structures occurs within the riparian area.

These matters should be specifically addressed in the assessment.

**Other matters**

- In regard to the rezoning of the riverfront land section of the site would raise issues around potential creation of additional domestic water rights. The draft Murray Regional Strategy raises this issue on Page 40 - *When preparing local environmental plans and development control plans and considering development applications, councils will consider controls to limit the creation of additional water rights on land fronting watercourses.*
  On the basis of this, OEH considers that it is inappropriate for new subdivisions to include direct frontage to rivers and streams.

- There appears uncertainty about whether reticulated sewer services would be available to the land given the area is currently beyond the extent of serviced land of Councils stated policy. Onsite effluent disposal is seen as unsuitable in the river frontage riparian environment given the pollution threat it would pose. OEH would consider that the provision of sewerage infrastructure to the site is mandatory for this proposal.

- *The Planning Proposal Report December 2011 by Habitat Planning* states *the presence of any potentially threatened habitat or species is not known and no information in this regard was submitted with the request for rezoning. Following a positive gateway determination an assessment would be undertaken to determine any potential habitat or species on the site Page 16*

  OEH considers that it is not appropriate for a Planning Proposal such as this to omit any consideration of its impact on threatened species. The southern half of the subject land has a relatively intact tree canopy, as well as an area of wetland, and is likely to contain habitat for a range of threatened species. Before any re-zoning is permitted, OEH would expect that an assessment of the potential direct and indirect impacts on threatened species of the re-zoning of this area would be is conducted.

*All communications to be addressed to:*

Headquarters
NSW Rural Fire Service
15 Carter Street
Lidcombe NSW 2141

Telephone: 1300 679 737
e-mail: csc@rfs.nsw.gov.au

Headquarters
NSW Rural Fire Service
Locked Mail Bag 17
GRANVILLE NSW 2142

Facsimile: (02) 8867 7983

The General Manager
Deniliquin Council
PO Box 270
Deniliquin NSW 2710

Your Ref: 2//562598
Our Ref: LEP/0040

DENILIQUIN COUNCIL
20 DEC 2012
RECEIVED BY RECORDS

**ATTENTION: Julie Rogers**

Dear Julie

**Planning Proposal – Kyalite Stables**

I refer to your letter dated 20 November 2012 seeking advice for the above Planning Proposal in accordance with Section 117 Direction.

The Service has reviewed the plans and documents received for the proposal and raises the following consideration in relation to bush fire risk:

- Any future lot created that includes land within the riparian corridor must have sufficient area where bushfire hazard reduction is permissible in order to achieve a complying Asset Protection Zone.

For any queries regarding this correspondence please contact Deborah Dawson.

Yours faithfully,

12/12/12.

Amanda Moylan
**Team Leader Development Assessment & Planning**

The RFS has made getting additional information easier. For general information on *Planning for Bush Fire Protection* 2006, visit the RFS web page at www.rfs.nsw.gov.au and search under *Planning for Bush Fire Protection* 2006.

CR2012/011300
SF2012/050238
MM

20 December 2012

Transport Roads & Maritime Services

The General Manager
Deniliquin Council
PO Box 270
DENILIQUIN NSW 2710



Attention: Julie Rogers

**REZONING PROPOSAL – LOT 2 AND PART LOT 3 DP562598 AND LOT 1 DP1121183, RIVERINA HIGHWAY (HW20), DENILIQUIN.**

I refer to your correspondence regarding the subject Development Application which was referred to the Roads and Maritime Services (RMS) for assessment and comment.

From the information supplied it is understood that the proposal is for the rezoning of the subject site to allow for a proposed community title subdivision to create 13 allotments ranging in area from approximately 0.5 to 1.15 Hectares which are intended to be used for rural residential purposes and a community title allotment for services and access provision to the Riverina Highway. The subject site has frontage to the Riverina Highway (HW20) within a 100 km/h speed zone.

The proposed 13 allotments intended for dwelling purposes all have frontage and therefore vehicular access through proposed Lot 1 which is the Association Property however 2 of the allotments will also have frontage to the road reserve of the Riverina Highway. To deny access from these 2 allotments directly to the Riverina Highway is consistent with the provisions of Clause 101(2) of State Environmental Planning Policy (Infrastructure). Further to this the current roadside environment and the speed limit along the Riverina Highway in the vicinity of the development site gives the motorist the impression of this road as being a rural road having limited access points rather than an urban road along which multiple access points at limited spacing would be expected.

A major focus of RMS is the safety and efficiency of the classified road network and the level of service provided by these roads and their associated infrastructure. The primary function of the classified roads should be to serve through traffic with local roads serving access needs to local development and properties. The current policy of RMS is to minimise the number of conflict points along the Classified Road Network to promote road safety and efficiency on this network.

In this regard RMS promotes the adoption of a strategic approach to the rezoning and subdivision of adjoining land holdings to provide for integration and connectivity within the various stages of the subdivision of the surrounding area and to minimise the number of access points required to the Classified Road Network. In this regard RMS considers that the potential for road connectivity from the subject development site to the future subdivision of the surrounding land holdings should be investigated and provided for.

Roads and Maritime Services

1 Simmons Street Wagga Wagga NSW 2650
PO Box 484 Wagga Wagga NSW 2650 DX 5407
www.rms.nsw.gov.au | 13 17 82

RMS in its submission to the recent draft LEP for Deniliquin referred to the need for a strategic approach to the subdivision of the area to be rezoned for development. A strategic approach to the subdivision pattern for an area rather than an ad-hoc approach to the subdivision of individual land holdings provides for effective and efficient provision of services and connectivity and integration of adjoining subdivisions and minimise the need for access directly to the Classified Road network.

A strategic approach to the rezoning of the subject site would be for the potential of the subject site and the surrounding land holdings to be considered concurrently. This may provide an option for access to adjoining land holdings and for the provision of a road access from Rose Street to the subject site. To address the current standard of construction of Rose Street and its intersection with the Riverina Highway rather than create a new intersection to the highway may prove to be beneficial to the subject site and the broader community.

It is anticipated that significant majority of traffic generated by the subdivision would be to and from Deniliquin requiring access into the subdivision via a right turn manoeuvre from the Riverina Highway. Based on the traffic volumes on the Riverina Highway and the expected traffic generation due to the proposed development the intersection of the proposed driveway with the Riverina Highway is required, as a minimum, to be designed and constructed as a Basic Right Turn (BAR)/Basic Left Turn (BAL) treatment.

Part of the subject site along the Riverina Highway frontage is zoned SP2 Infrastructure. This does not appear to have been addressed in the supporting information prepared by Habitat Planning submitted with the application. This land has been identified as being required for future road widening purposes and may in the future be acquired by RMS for road purposes. This zoning affects proposed Lots 12, 17 and 1 along the frontage to the Riverina Highway. The required land is identified by the attached plan – DP 247147. RMS is proposing to review the required road widening of the Riverina Highway along the subject site. Please note that should RMS still require the road widening following this review and acquire the land zoned SP2 for road purposes proposed lots 1, 12 and 17 will be reduced in area.

Under the provisions of the SP2 zoning no significant buildings or major structures are permitted to be built or established on this part of the site. Clause 100 of State Environmental Planning Policy (Infrastructure) essentially states that consent for development which meets the specified criteria, as listed in that clause, on land reserved for the purposes of a classified road may only be granted with the concurrence of Roads and Maritime Services (RMS). Information relating to any land acquisition was forwarded to Council in correspondence dated 20 January 2012.

Further to the above any pedestrian access to the Riverina Highway will likely promote the parking of vehicles along the frontage of these allotments to the Riverina Highway. As this frontage to the Riverina Highway is not treated with kerb and gutter the parking of vehicles along the Highway will impact on the roadside area and edge of seal of the carriageway. Any consent is to be conditioned to deny vehicular and pedestrian access directly from the Riverina Highway to the proposed allotments.

Due to the restrictions on access any future development of the proposed allotments for residential purposes is likely to be oriented towards proposed Lot 1 with the rear of the properties facing toward the Riverina Highway. For visual reasons and to address impacts of headlights on any future dwellings consideration should be given to a requirement for the establishment and maintenance of a landscaped buffer area along the frontage of any proposed allotment to the highway.

RMS is mainly concerned with the provision of safe access between the subject site and the public road network and the impact of the development on the safety and efficiency of the road network. Should Council resolve to rezone the land in isolation RMS provides the following conditions for road safety reasons as the subject site has frontage and access to the Riverina Highway, which is a classified road, within a 100 km/h speed zone.

Roads and Maritime Services has assessed the Development Application based on the documentation provided and would raise no objection to the development proposal subject to the Consent Authority ensuring that the development is undertaken in accordance with the information submitted as amended by the inclusion of the following requirements as conditions of consent (if approved):-

1. The location of any proposed dwelling and ancillary structures on proposed Lots 12 and 17 shall be located at least 5 metres outside the extent of the SP2 zone as per the Deniliquin LEP. Only minor structures, such as rural fencing and landscaping are permitted to be erected within that part of proposed Lots 1, 12 and 17 that is zoned as SP2. The proposed access road to the Riverina Highway is permitted within that part of proposed Lot 1 zoned as SP2.

2. The proposed driveway to the Riverina Highway (HW20) is to be located and the roadside maintained so as to provide the required Safe Intersection Sight Distance (SISD) in either direction in accordance with the Austroads Publications as amended by the Roads and Maritime Services (RMS) supplements for the prevailing speed limit. Compliance with this requirement is to be certified by an appropriately qualified person prior to construction of the vehicular access.

3. The driveway to the Riverina Highway (HW20) shall be constructed as a "Rural Property Access" type treatment in accordance with the Austroads Guide to Road Design as amended by the RMS supplements and is to be constructed perpendicular (or at an angle of not less than 70 degrees) to the carriageway of the highway.

4. The proposed intersection and driveway is to be designed and constructed with a minimum width to provide for two way movement to accommodate the largest size of vehicle likely to access the subject site. As a minimum the entrance from the Riverina Highway is to be line marked to separate the sweep path of vehicles entering and exiting the site. Associated directional marking and signage is to be installed in accordance with Australian Standards.

5. As a minimum the intersection of the proposed driveway with the Riverina Highway (HW20) is to be constructed to provide a sealed Basic Right Turn (BAR) and Basic Left Turn (BAL) treatment in accordance with the Austroads Guide to Road Design as amended by the Roads and Maritime Services supplements for the prevailing speed limit and to cater for largest size vehicle likely to access the site.

6. The intersection of the proposed driveway for the development with the Riverina Highway (HW20) shall be offset by a minimum distance of 30 metres along the centreline of the Riverina Highway (HW20) from any existing driveway or intersection on either side of the road.

7. As a minimum the driveway shall be sealed from the edge of seal of the carriageway to the entry gate or the property boundary whichever is the greater. This is required to prevent deterioration of the road shoulder and the tracking of gravel onto the roadway. The driveway access within the subject property should be constructed using an all weather surface.

8. Any entry gate to proposed Lot 1 shall be located at least 40m from the edge of seal of the carriageway of the Riverina Highway or at the property boundary whichever is the greater. This is to allow for the standing of large vehicles when gates are to be opened.

9. Any vehicular access point into proposed Lot 12 from the driveway through proposed Lot 1 is to be located a minimum of 50 metres from the road reserve of the Riverina Highway.

10. Vehicular and pedestrian access directly to the road reserve of the Riverina Highway is denied for proposed Lots 12 and 17. Access for these allotments shall be via proposed Lot 1 only. A restrictive covenant to this effect is to be created, with the Council empowered to uplift, over each of these proposed allotments.

11. Suitable drainage treatment is to be implemented within the development site to retard any increased storm water run-off from the development site to the road reserve of the Riverina Highway.

12. Any driveway to the Riverina Highway is to be designed, constructed and maintained to prevent water from proceeding onto the carriageway of the road. If a culvert is be installed and is to be located within the clear zone of the Riverina Highway for the prevailing speed zone it is to be constructed with a traversable type headwall.

13. Following the construction of the new driveway all existing driveways or gates to Riverina Highway are to be removed and the road reserve is to be restored to match the surrounding roadside in accordance with Council requirements.

14. Provision is to be made for bus bays for school buses to service all the proposed allotments within the proposed subdivision. The bus bays shall be located within proposed Lot 1 and not within the road reserve of the Riverina Highway.

15. Landscaping and fencing shall be established and maintained within the allotments that have frontage to the Riverina Highway to a standard to provide a visual screen from the adjoining road and minimise the impact of road related noise and vehicle headlights. A vegetated buffer at least 5m wide and planted with a variety of endemic species and growing to a mature height of up to 5m is to be established and maintained within these allotments.

16. The Riverina Highway (HW20) is part of the State Road network. For works on the State Road network the developer is required to enter into a Works Authorisation Deed (WAD) with Roads and Maritime Services before finalising the design or undertaking any construction work within or connecting to the road reserve. The applicant is to contact the Land Use Manager for the South West Region on Ph. 02 6938 1111 for further detail.

    The developer will be required to submit detailed design plans and all relevant additional information including cost estimates and pavement design details for the works, as may be required in the Works Authorisation Deed documentation, for each specific change to the state road network for assessment and approval by Roads and Maritime Services (RMS). However, the developer is encouraged to submit concept plans of the layout of the proposed works for checking by Roads and Maritime Services (RMS) prior to undertaking the detailed design phase.

17. Prior to works commencing within the road reserve the applicant must apply for and obtain approval under Section 138 of the Roads Act, 1993 from the road authority (Council) and concurrence from Roads and Maritime Services. Any works within the road reserve require a Traffic Control Plan in accordance with the Traffic Control at Work Sites Manual adopted by Roads and Maritime Services.

18. The developer is responsible for all public utility adjustment/relocation works, necessitated by the proposed works and as required by the various public utility authorities and/or their agents. It should be noted that the relocation of any utility service within the road reserve will require concurrence from Roads and Maritime Services under section 138 of the Roads Act, 1993 prior to commencement of works.

19. Any works associated with the proposed development shall be at no cost to the Roads and Maritime Services (RMS).

Further to the above suggested conditions the Council may also give consideration to the following requirements for future development of the created allotments.

1. The future development on the proposed allotments should be designed such that road traffic noise from the Riverina Highway is mitigated by durable materials, in accordance with the Environmental Protection Authority criteria 'The Environmental Criteria for Road Traffic Noise'. Where the EPA external noise criteria would not practically or reasonably be met, Roads and Maritime Services recommends that Council applies the following internal noise objectives for all habitable rooms under ventilated conditions complying with the requirements of the BCA:
    - All sleeping rooms: 35 dB(A) Leq(9hr)
    - All other habitable rooms: 45 dB(A) Leq(15hr) and 40 dB(A) Leq(9hr).

Please be advised that under the provisions of the Environmental Planning & Assessment Act it is the responsibility of the Consent Authority to assess the environmental implications, and notify potentially affected persons, of any development including conditions.

Any enquiries regarding this correspondence may be referred to the Land Use Manager for RMS (South West Region), Maurice Morgan, phone (02) 69371611.

**Please forward a copy of the Notice of Determination for this Development Application to the Roads and Maritime Services at the same time as advising the applicant.**

Yours faithfully

Per:
Mitch Judd
Acting Regional Manager
South West Region

# Appendix 4

**Proposed Subdivision Layout**

# Appendix 5

**Section 117 Directions**

## CONSISTENCY WITH SECTION 117 DIRECTIONS

**1.1 Business and Industrial Zones** **Not applicable**

This direction does not apply to this planning proposal as it does not affect land within an existing or proposed business or industrial zone.

**1.2 Rural Zones** **Inconsistent**

This direction applies to this planning proposal as it proposed to rezone land from a rural zone to a residential zone. It is proposed to rezone approximately12.63ha of land zoned RU1 Primary Production to R5 Large Lot Residential. The planning proposal is inconsistent with this direction but the inconsistency is considered to be of minor significance given the small area of rural land that is to be rezoned to residential. The area of the land means that it has limited agricultural value or capability and the volume of land to be rezoned is considered insignificant when considered in the context of the land available for agriculture across the whole Council area.

**1.3 Mining, Petroleum Production and Extractive Industries** **Inconsistent**

This direction applies to this planning proposal as it will have the effect of prohibiting or restricting the development of natural resources on this land. The planning proposal is inconsistent with this direction but the inconsistency is considered to be of minor significance as Council is not aware of any significant deposits of coal, other minerals, petroleum or extractive material occurring on the site. The initial gateway determination received by Council required Council to consult with the Department of Primary Industries – Minerals and Petroleum due to this inconsistency. Council wrote to them on 20 November 2012 requesting their comments in relation to the planning proposal and no response was received.

**1.4 Oyster Aquaculture** **Not applicable**

This direction does not apply to this planning proposal as the site is not within the Priority Oyster Aquaculture Areas nor is it identified in the NSW Oyster Industry Sustainable Aquaculture Strategy (2006).

**1.5 Rural Lands** **Inconsistent**

Clause 3(a) of this direction applies to the planning proposal as it affects land within an existing rural zone. The planning proposal is inconsistent with this direction but the inconsistency is considered to be of minor significance when considered in the context of the rural planning principles.

The following comments in relation to the rural planning principles are provided:

1. The promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas.
   *The subject site has 12.63ha of RU1 zoned land and in the context of the land area zoned RU1 in the Council area, the rezoning will not undermine will not undermine opportunities for current and potential productive and sustainable economic activities in rural areas.*

2. Recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State.
   *The rezoning of the subject site does not undermine the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State. The subject site is small in area when considered in the context of rural land within the Council area, the region and the State.*

3. Recognition of the significance of rural land uses to the State and rural communities, including social and economic benefits of rural land use and development.
   *Rural land uses are of a great importance to Council and its communities and readily acknowledged the social and economic benefits of rural land use and development. The rezoning of the subject site does not undermine this importance when considered in the context of the amount of rural land within the Council area.*
4. In planning for rural lands, to balance the social, economic and environmental interests of the community.
   *Council has considered the social, economic and environmental interests of the community as part of preparing this planning proposal. The reduction in rural land does not significantly impact on the social, economic and environmental interests of the community given the size of the land and within the context of the land currently zoned for rural uses in the Council area.*

5. The identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land.
   *Specialist reports have been prepared addressing site specific issues such as flooding, biodiversity and Aboriginal cultural heritage. These reports have concluded that subject to conditions, the planning proposal can proceed.*

6. The provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities.
   *The planning proposal does not detract from opportunities to provide a rural lifestyle in other villages within the Council area.*

7. The consideration of impacts on services and infrastructure and appropriate location when providing for rural housing.
   *The planning proposal does not propose to provide for rural housing. However, the subject site is capable of being serviced.*

8. Ensuring consistency with applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General.
   *There is no regional strategy that applies to this region.*

**2.1 Environment Protection Zones** **Not applicable**

Council does not consider that this direction applies to this planning proposal. The Direction states that an LEP must include provisions that facilitate the protection and conservation of environmentally sensitive areas and land within an environment protection zone or land otherwise identified for environment protection purposes in a LEP must not reduce the environmental protection standards that apply to the land (including by modifying development standards that apply to the land).

The specialist studies for flooding, biodiversity and Aboriginal cultural heritage do not identify any environmentally sensitive land that requires protection by the introduction of an environmental protection zones. However, Council does recognise the flooding sensitivity of the land and the importance of retaining the existing vegetation and as a result proposes to introduce a number of LEP clauses to address this issue.

**2.2 Coastal Protection** **Not applicable**

This direction does not apply to this planning proposal as the site is not within the coastal zone as defined in the Coastal Protection Act 1979.

**2.3 Heritage Conservation** **Not applicable**

This direction does not apply to this planning proposal as LEP 2013 currently contains heritage conservation provisions and it is not proposed to make any changes to these provisions. The Aboriginal cultural heritage study did not identify items or places that require protection.

**2.4 Recreation Vehicle Areas** **Not applicable**

This direction does not apply to this planning proposal as it is not proposed to enable the development of the land for the purpose of a recreation vehicle area within the meaning of the Recreation Vehicles Act 1983.

**2.5 Application of E2 and E3 Zones and Environmental Overlays in Far North Coast LEPs** **Not applicable**

This direction does not apply to this planning proposal as it does not apply to the Edward River local government area.

**3.1 Residential Zones** **Inconsistent**

This direction applies to this planning proposal as it is proposed to rezone land from RU1 Primary Production to R5 Large Lot Residential. The planning proposal involves a change of zone but will not change any clauses in the LEP 2013 that relate to residential development. It is proposed to insert clauses into the LEP 2013 which address issues around flooding and river setbacks but these will not impact on housing choice, design or location.

Clause 6.7 of the LEP 2013 requires adequate arrangements for essential services to be in place for development. There will be no changes to the permissible residential density of land but it is proposed to alter the minimum lot size for the R5 zone for the 5 lots with river frontage so that these lots can be created but no further subdivision will be permitted to occur. This is to ensure that development that occurs on the site is within the constraints of the site in particular flooding.

On this basis it is considered that the planning proposal is inconsistent with this direction but it is considered to be of minor significance. The inconsistency is justified on the basis that an increase in residential density beyond that proposed in the planning proposal could result in significant flood impacts on surrounding land.

**3.2 Caravan Parks and Manufactured Home Estates** **Consistent**

This direction applies to this planning proposal and it is considered to be consistent with this direction.

Caravan parks and manufactured home estates (under the provisions of State Environmental Planning Policy 36 Manufactured Home Estates) are prohibited in the RU1 and SP2 zones. In the R5 zone caravan parks and manufactured home estates are permissible. There are no changes proposed to the permissibility of uses in the R5 zone as a result of this planning proposal.

**3.3 Home Occupations** **Consistent**

This direction applies to this planning proposal and it is considered to be consistent with this direction.

Home occupations are permissible without consent in the RU1 zone and prohibited in the SP2 zone. In the R5 zone home occupations will be permissible without consent.

**3.4 Integrating Land Use and Transport** **Inconsistent**

This direction applies to this planning proposal as it is proposed to rezone the subject site to residential. The planning proposal is inconsistent with this direction but the inconsistency is of minor significance. Given the nature of the Edward River local government area public transport including a community bus service are available but have limited service runs and there is a high level of car dependency. The lots that would be created by this subdivision will not significantly increase the need for a public transport system or increase the level of car dependency dramatically.

**3.5 Development Near Licensed Aerodromes** **Inconsistent**

This direction applies to this planning proposal as it involves a zoning change within the vicinity of a licensed aerodrome. The planning proposal is inconsistent with this direction but this inconsistency is of minor significance. The site falls within the Obstacle Limitation Surface (OLS) but it is unlikely that the development will penetrate the OLS given its distance from the Deniliquin airport and the type of development likely to occur on the site (eg dwellings and ancillary sheds). The initial gateway determination received by Council required consultation with the Civil Aviation Safety Authority (CASA). Council wrote to CASA on 20 November 2012 and received a response on 7 December 2012. CASA advised that they have not jurisdiction over local land use planning but Council should confirm that the development falls outside the Obstacle Limitation Surface and PANS-OP airspace and sensible cladding material should be used during construction and external lights should be shielded below the horizontal to minimise glare and possible effects on pilots. These issues can be considered during the assessment of any subsequent development applications.

There is no ANEF for the Deniliquin airport.

**3.6 Shooting Ranges** **Not applicable**

This direction does not apply to this planning proposal as the subject site is not adjacent to and/or adjoining an existing shooting range.

**4.1 Acid Sulfate Soils** **Not applicable**

This direction does not apply to this planning proposal as there are no Acid Sulfate Soils Planning Maps that apply to the subject site.

**4.2 Mine Subsidence and Unstable Land** **Not applicable**

This direction does not apply to this planning proposal as the subject site is not within a Mine Subsidence District nor has it been identified as unstable land.

**4.3 Flood Prone Land** **Consistent**

This direction applies to this planning proposal as the subject site is flood prone land and it is proposed to rezone land within a flood planning area from rural to residential.

Development in Floodway Areas

The Kyalite Stable Flood Impact Assessment (WMAwater 2015) stated that the site does contain a section of floodway and Figure 4 WMAwater report (2015) shows the location of the floodway. The floodway occurs in the eastern corner of the lot where flow is relatively deep however the areas of floodway do not infringe on the proposed building envelopes.

Significant Flood Impacts to Other Properties

The WMAwater (2015) report concluded that the proposed subdivision and subsequent development would not result in significant flood impacts to other properties. The proposed works (which include filling areas of the floodplain which have the potential to increase peak flood level in the vicinity of the works) were assessed for their impact on existing flood behaviour in the vicinity of the property. Results show that the proposed development does not cause adverse offsite impacts in the 1% AEP event. Figure 6 of the WMAwater report (2015) shows the change in flood level in this event as well as the location of the works. The figure shows that there is a slight increase of up to 0.05m in peak flood level where the proposed access road impedes flow, but that this increase does not affect any neighbouring properties. There are no other adverse impacts on or adjacent to the site.

Significant Increase in the Development of Land

The planning proposal will permit the subdivision of land in accordance with the established provisions of the R5 zone under the LEP 2013. There are currently three lots on which there are two existing dwellings and one dwelling entitlement. It is proposed that the subdivision will produce 7 lots which will be an additional 4 lots. These 4 additional lots do not constitute a significant increase in the development of the land given that the WMAwater (2015) report has concluded that the proposed subdivision will not have an adverse impact on or adjacent to the site and the building envelopes

Substantial Increase for Government Spending on Flood Mitigation Measures, Infrastructure or Services

It is noted that the proposed development is located outside of the existing levee system in Deniliquin and within the flood planning area. In accordance with LEP 2013 all buildings and other development on the site shall be required to meet the stated flood control measures, such as minimum floor heights and evacuation management plans. As such each development shall meet its own requirements for managing flood risk without increasing the requirements or resources of the government.

As part of the development there shall be an increase in the number of dwellings on the site, from three to seven. This may lead to an increase in people that may need to be evacuated by State Emergency Services (SES) in times of major flood. Through the current Floodplain Risk Management Plan process it has been noted that there are approximately 200 existing properties in Deniliquin that are in a similar situation in that people at these dwellings may require evacuation from SES during times of major flood. This includes dwellings in the immediate vicinity of the site. As such it is considered that the development shall not substantially increase the resources required from SES, or the government, during major flood events.

During the preparation of this amended planning proposal Council has had extensive consultation with the Office of Environment and Heritage in relation to flooding. As part of this consultation Council received advice from the SES (requested by the Office of Environment and Heritage) in relation to flooding. This advice has been noted and Council is willing to work with the SES to updated its Flood Plan is if it necessary. Council is also proposing to insert the appropriate flood planning controls in the LEP 2013 that will apply specifically to this site. As an aside, Council's Floodplain Risk Management Committee is preparing a Floodplain Risk Management Study and Plan that is also considering appropriate Council wide flood planning controls and it is currently on exhibition.

Permit Development Without Development Consent

The proposed zone is R5 which is a zone that is already established under the Deniliquin Local Environmental Plan 2013. The uses permissible without consent within this zone are environmental protection works, home occupations and water reticulation systems. Agriculture and roads are permissible with consent. Environmental protection works are permissible without consent due to the nature of work that falls within this definition, home occupations are mandated to be permissible without consent in the zone and water reticulation systems are mandated to be permissible without consent under the State Environmental Planning Policy Infrastructure 2007 (Infrastructure SEPP).

Flood Related Development Controls above the Residential Flood Planning Level

Council will not be imposing flood related development controls above the residential flood planning level for residential development on land. It is proposed to set the flood planning level at 1%AEP + 300mm. This is consistent with the recommendations of Council's Draft Floodplain Risk Management Study and Plan which is currently on exhibition.

Determination of Flood Planning Level

The flood planning level for the subject site will be 1%AEP + 300mm which as previously stated is consistent with Council's Draft Floodplain Risk Management Study and Plan which is currently on exhibition and has been prepared in accordance with the Floodplain Development Manual 2005.

**4.4 Planning for Bushfire Protection** **Inconsistent**

This direction applies to this planning proposal as the subject site is mapped as bushfire prone land.

The initial gateway determination required Council to consult with the NSW Rural Fire Service and Council wrote to them on 20 November 2012. The NSW Rural Fire Service advised Council in its letter dated 20 December 2012 that any future lot created that includes land within the riparian corridor must have sufficient area where bushfire hazard reduction is permissible in order to achieve a complying asset protection zone.

It is proposed that Council will consult with the NSW Rural Fire Service as part of this planning proposal.

**5.1 Implementation of Regional Strategies** **Not applicable**

This direction does not apply to this planning proposal as there is no regional strategy for our region.

**5.2 Sydney Drinking Water Catchment** **Not applicable**

This direction does not apply to this planning proposal as the subject site is not within the Sydney drinking water catchment.

**5.3 Farmland of State and Regional Significance on the NSW Far North Coast** **Not applicable**

This direction does not apply to this planning proposal as the subject site is not located on the NSW Far North Coast.

**5.4 Commercial and Retail Development along the Pacific Highway, North Coast** **Not applicable**

This direction does not apply to this planning proposal as the subject site is not in the vicinity of the existing and/or proposed alignment of the Pacific Highway.

**5.8 Second Sydney Airport: Badgerys Creek** **Not applicable**

This direction does not apply to this planning proposal as the subject site is not in the vicinity of the future second Sydney Airport at Badgerys Creek.

**5.9 North West Rail Link Corridor Strategy** **Not applicable**

This direction does not apply to this planning proposal as the subject site is not located in the nominated Council areas.

**5.10 Implementation of Regional Plans** **Not applicable**

This direction does not apply to this planning proposal there is not Regional Plan applying to the Edward River local government area.

**6.1 Approval and Referral Requirements** **Not applicable**

This direction does not apply to this planning proposal as it does not propose any approval or referral requirements to a third party.

**6.2 Reserving Land for Public Purposes** **Consistent**

Part of the subject site is zoned SP2 Infrastructure and has been identified as land that is required for road widening by the Roads and Maritime Service. This planning proposal is considered to be consistent with this direction as it does not propose to alter or reduce the land reserved for public purposes. However, Council has had preliminary discussions with the Roads and Maritime Services about the planning proposal and this land. Roads and Maritime Services have advised that they maybe in a position to review the requirement for road widening along this section of the Riverina Highway. .

**6.3 Site Specific Provisions** **Not applicable**

This direction does not apply to this planning proposal as it has not been prepared with the intent to allow a particular development to be carried out on site. The planning proposal does propose particular planning controls for the land and this is discussed in other parts of the planning proposal

**7.1 Implementation of a Plan for Growing Sydney** **Not applicable**

This direction does not apply to this planning proposal as the subject site is not located in the nominated Council areas.

**7.2 Implementation of Greater Macarthur Land Release Investigation** **Not applicable**

This direction does not apply to this planning proposal as the subject site is not located within the Greater Macarthur Land Release Investigation Area.

# Appendix 6

**Flood Study (WMAwater 2015)**

Julie Rogers
PO Box 270, Civic Place
Deniliquin NSW 2710

115027-02/L151214

16 December 2015

**Attention: Julie Rogers**

Dear Julie,

**Re: Kyalite Stables Flood Impact Assessment**

This letter describes a flood impact assessment undertaken for a proposed development at 21701 Riverina Highway, Deniliquin. The assessment found that the proposed changes to the floodplain, including addition of roads and building pads, do not adversely affect flood behaviour in the 1% AEP flood event. Information is also provided describing the site's design flood behaviour.

## Background

Re-zoning and residential development is proposed for 21701 Riverina Highway, Deniliquin. The existing site consists of a 13.3 ha lot located on the Riverina Highway on the outskirts of North Deniliquin, as shown on Figure 1. Residential development on the site would involve having the property re-zoned from RU1 Primary Production to R5 Large Lot Residential. Conceptual features that have been assessed for their impact on flooding are shown on Figure 1 and are as follows:

- Access roads between Riverina Highway and each of the proposed lots. To allow access to the highway during a flood, the roads have been set at a level of 92.60 mAHD.
- Culverts beneath each of the access roads, each consisting of a 1200 mm x 600 mm box culvert.
- A building envelope for each lot, modelled as a 600 $m^2$ area raised at the 1% AEP flood level plus freeboard (as per the minimum floor level requirements).

Results from the Edward River at Deniliquin Flood Study (WMAwater, 2014) have been utilised to describe the existing flood behaviour.

## Existing Flood Behaviour

The proposed development experiences widespread inundation in large floods. The site is on the banks of the Edward River, which is an anabranch of the Murray River and has a long history of flooding. When the river's capacity is exceeded during a flood, flow spreads over the site, eventually reaching the Riverina Highway. Flow is generally parallel to the river, with deeper and higher velocity flow occurring in a relatively low-lying area near the channel. Figure 2 shows the peak flood depth and level in the 1% AEP event. The figure shows the entire lot is inundated in the 1% AEP event, with a maximum flood level of 92.97 mAHD on the south-east boundary, a maximum depth of over 4 m and most of the site having 0.6-0.8 m depth of



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inundation. Widespread inundation of the site first occurs in the 5% AEP event, which has a peak flood level of 92.2 mAHD. Velocities over the site in the 1% AEP are 0.1-0.2 m/s, with some areas near the river having up to 0.5 m/s.

The site is affected by a mix of low and high hazard flow in the 1% AEP event and also contains section of floodway. Figure 3 shows the hydraulic hazard in the 1% AEP event across the site, while Figure 4 shows the hydraulic categories. As shown on the figures, the half of the site closest to the river is affected by high hazard flow. Floodway occurs in the eastern corner of the lot, where flow is relatively deep. Areas of floodway do not infringe on proposed building envelopes. The remainder of the site is classified as flood fringe.

Further information on hydraulic hazard is given by the draft hazard categories from the National Flood Manual (AEM Handbook 7). They consist of six categories of hazard, based on their risk to people, vehicles and buildings and derived from the design depth and velocity. The categories for the site are shown on Figure 5 and are as follows:

- H1 – Generally Safe
- H2 – Unsafe for small vehicles
- H3 – Unsafe for all vehicles, children and the elderly
- H4 – Unsafe for all people and all vehicles
- H5 – Unsafe for all people and all vehicles. Buildings require special engineering design
- H6 – Unconditionally dangerous

As shown on the figure, the majority of the site is classified as H3, with parts of H4 and H5 towards the river. Proposed buildings would are not located in H6, and while one is located in an area of H5, the hazard to proposed dwelling is managed by the raised ground around the building.

**Flood Emergency Response**

The site has significant evacuation constraints as it can be completely inundated and cut off during a flood event. The land is classified as a Flooded Isolated Submerged under the National Flood Manual guidelines, which means that it has an evacuation route to higher ground but that this can become inundated, as well as the property itself. Evacuation for the site will be required if an evacuation order is issued by the SES. Access roads on the site are proposed to be set at 92.60 mAHD, which is the elevation of the Riverina Highway, and will ensure roads on the site do not impair evacuation (nevertheless, they will be flooded in a large flood). Note that access roads at 92.60 mAHD will be inundated by a depth of 0.3 m in the 1% AEP event, and so access will be possible for most vehicles in slightly smaller events. Issues relating to the site's emergency response include:

- The site's location on Deniliquin's outskirts is quite isolated, which will make potential rescues during a large flood more difficult than for most other properties.
- The location also means more detailed information will be required for flood awareness, as access to South Deniliquin (which has a higher level of flood protection) will be via North Deniliquin and Davidson Street, both of which have flood affectation. Flood awareness must describe the reliance on these two areas and their flood behaviour. If the need for evacuation is solely based on the affectation at the property (i.e. waiting till houses are surrounded), once the need to evacuate is recognised, it will be too late to evacuate to South Deniliquin.
- Flood awareness information must also not understate the risk of flooding. As described, there is high hazard flow across most of the site in a large event, and houses built above

the flood level will not be inhabitable during a flood, due to the long duration of flooding (can be several weeks). Similarly, the access roads on the property will be inundated in a large enough flood and impair or prevent evacuation. It is important that this information is conveyed to residents and property owners and evacuation orders are heeded, given the area's reliance on Davidson Street and North Deniliquin.

As discussed, emergency response can be aided via flood awareness for residents and property owners of the site. Awareness can be raised via an evacuation plan for the site. Such a plan should contain an overview of flooding in a range of design events, and information relating flood behaviour to gauge depths, for example:

- A low point on the Davidson Street levee is overtopped at a gauge height of 9.18 m, and Davidson Street is inundated at three points at a gauge height of 9.62 m. The site should be evacuated if flooding is forecast that will inundate Davidson Street for several days, as it is the main access road to South Deniliquin.
- At a gauge height of 9.4 m, which corresponds to the 5% AEP peak flood level, around one third of the site is inundated. Floods forecast to reach any higher level will inundate the majority of the site and residents should evacuate to South Deniliquin before access roads are cut (9.18 m). The Riverina Highway from the site into North Deniliquin is completely inundated in a 2% AEP event (9.9 m at the gauge).

A gauge trigger level can be determined in consultation with the SES for evacuation of the properties, based on this information and their other evacuation procedures for the town. Gauge information provided here refers to the Edward River at Deniliquin gauge (no. 409003) located just upstream of the National Bridge.

**Impact on Flood Behaviour**

The proposed works were assessed for their impact on existing flood behaviour in the vicinity of the property. The works include filling areas of the floodplain, which has the potential to increase peak flood levels in the vicinity of the works. The effect of the changes was determined by schematising the changes in the hydraulic model that exists for the catchment. The model, which is based on the TUFLOW software, was developed as part of the Edward River at Deniliquin Flood Study (2014). The schematised changes were then used to model a 'proposed' case, which could then be used to determine the change in peak flood level, by comparing to the 'existing' case.

Changes made in the 'proposed' case are shown on Figure 1 and are based on proposed layout of the site. Building envelopes are above the 1% AEP peak flood level and so act as impermeable obstructions, while the various access roads are based on the elevation of Riverina Highway, which is the only access road. As described, 1200 mm x 600 mm box culverts have been modelled. It should be noted that results are based on the concept design shown on the figure, including 600 $m^2$ building envelopes, and results may change under variations to this design.

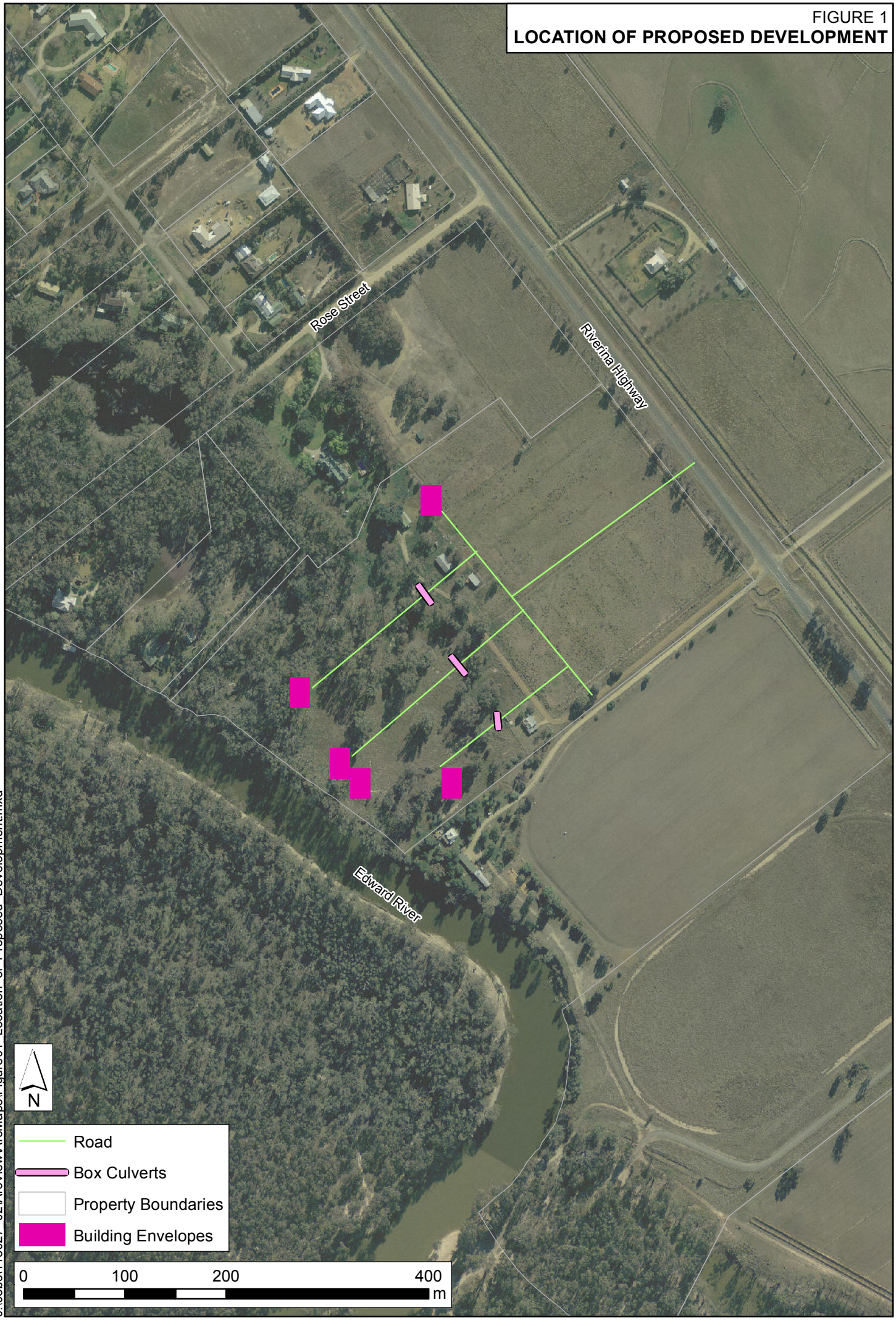
**Results**

Results show that the proposed development does not cause adverse offsite impacts in the 1% AEP event. Figure 6 shows the change in flood level in this event, as well as the location of the works. The figure shows that there is a slight increase of up to 0.05 m in peak flood level where the proposed access road impedes flow, but that this increase does not affect any neighbouring properties. There are no other adverse impacts on or adjacent to the site.

Yours Sincerely,

**Felix Taaffe**
Project Engineer

FIGURE 1
**LOCATION OF PROPOSED DEVELOPMENT**




J:\Jobs\115027 02\ArcView\ArcMaps\Figure01 Location of Proposed Development.mxd

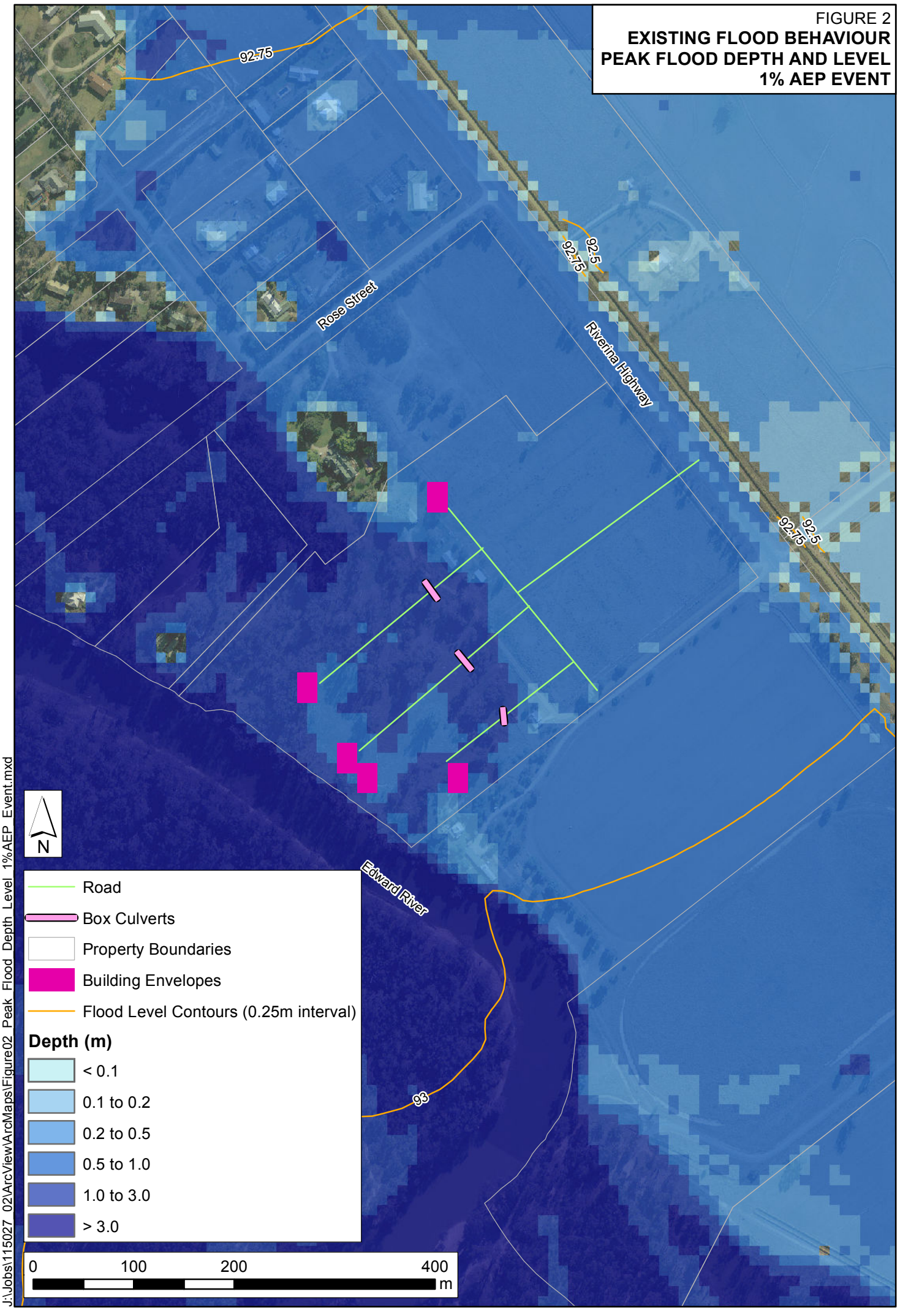


FIGURE 2
EXISTING FLOOD BEHAVIOUR
PEAK FLOOD DEPTH AND LEVEL
1% AEP EVENT
92.75
92.5
92.75
Rose Street
Riverina Highway
92.75
92.5
N
Edward River
93
Road
Box Culverts
Property Boundaries
Building Envelopes
Flood Level Contours (0.25m interval)
Depth (m)
< 0.1
0.1 to 0.2
0.2 to 0.5
0.5 to 1.0
1.0 to 3.0
> 3.0
0
100
200
400
m
J:\Jobs\115027 02\ArcView\ArcMaps\Figure02 Peak Flood Depth Level 1%AEP Event.mxd

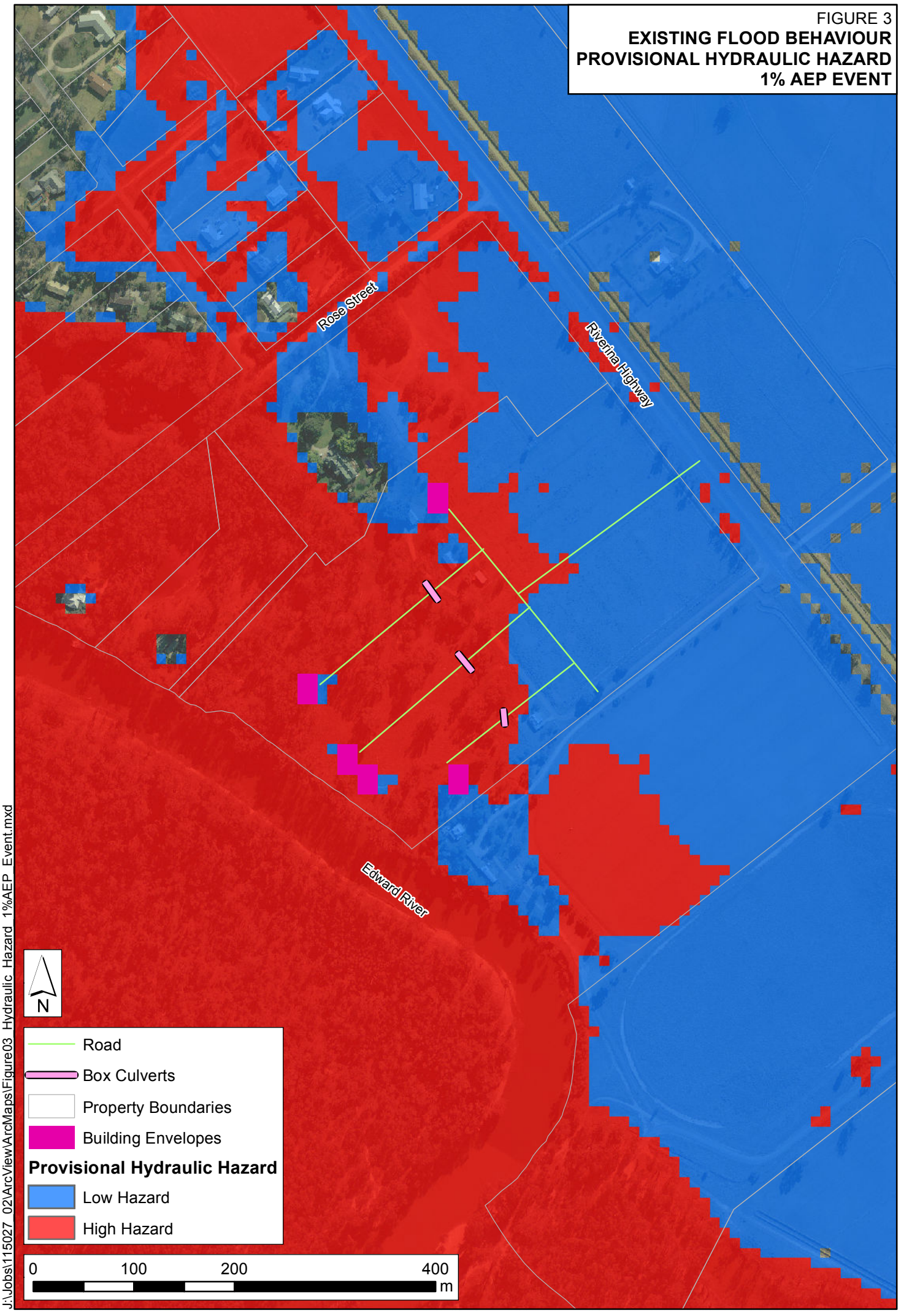


FIGURE 3
EXISTING FLOOD BEHAVIOUR
PROVISIONAL HYDRAULIC HAZARD
1% AEP EVENT
Rose Street
Riverina Highway
Edward River
N
Road
Box Culverts
Property Boundaries
Building Envelopes
Provisional Hydraulic Hazard
Low Hazard
High Hazard
0
100
200
400
m
J:\Jobs\115027 02\ArcView\ArcMaps\Figure03_Hydraulic_Hazard_1%AEP_Event.mxd

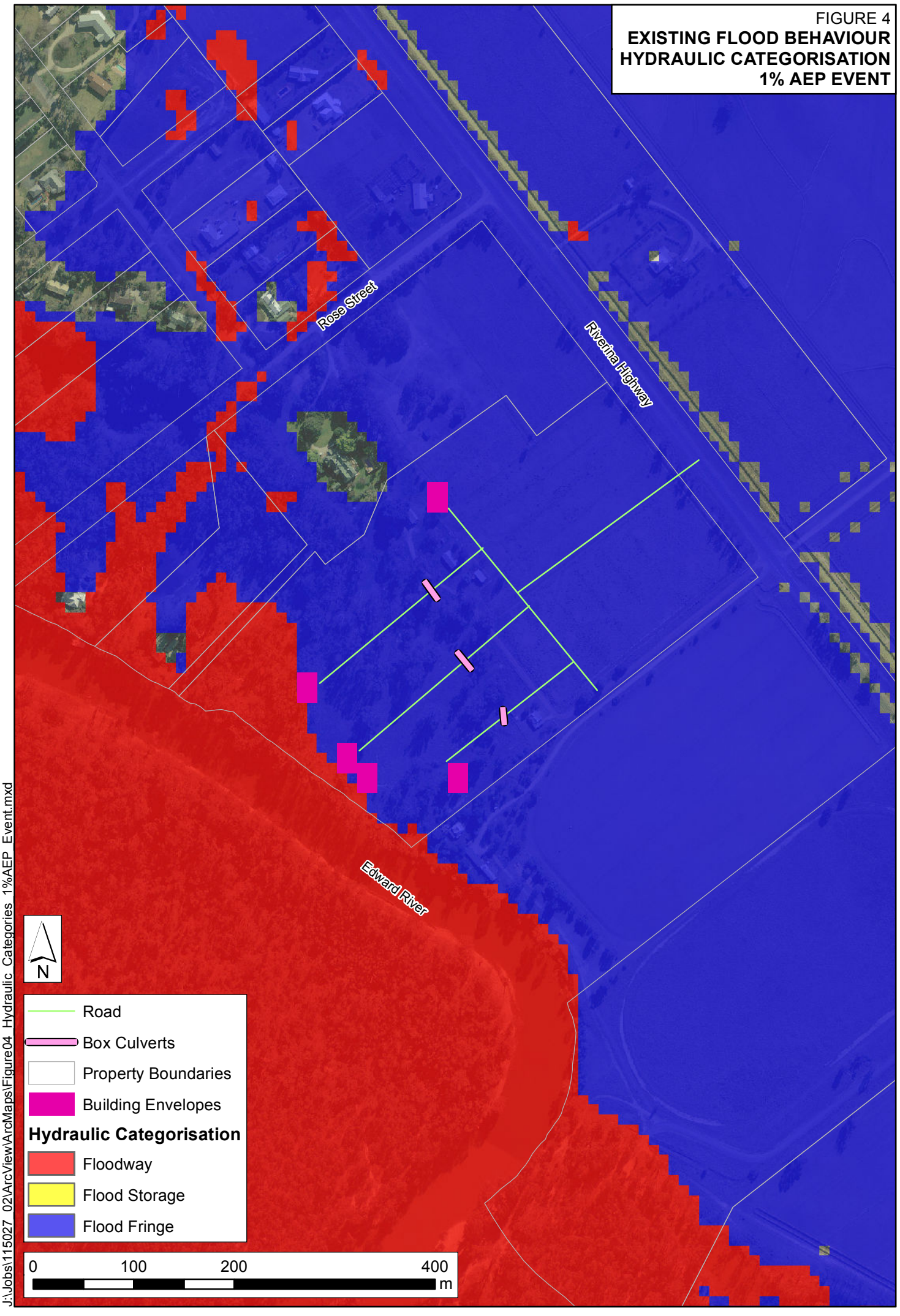
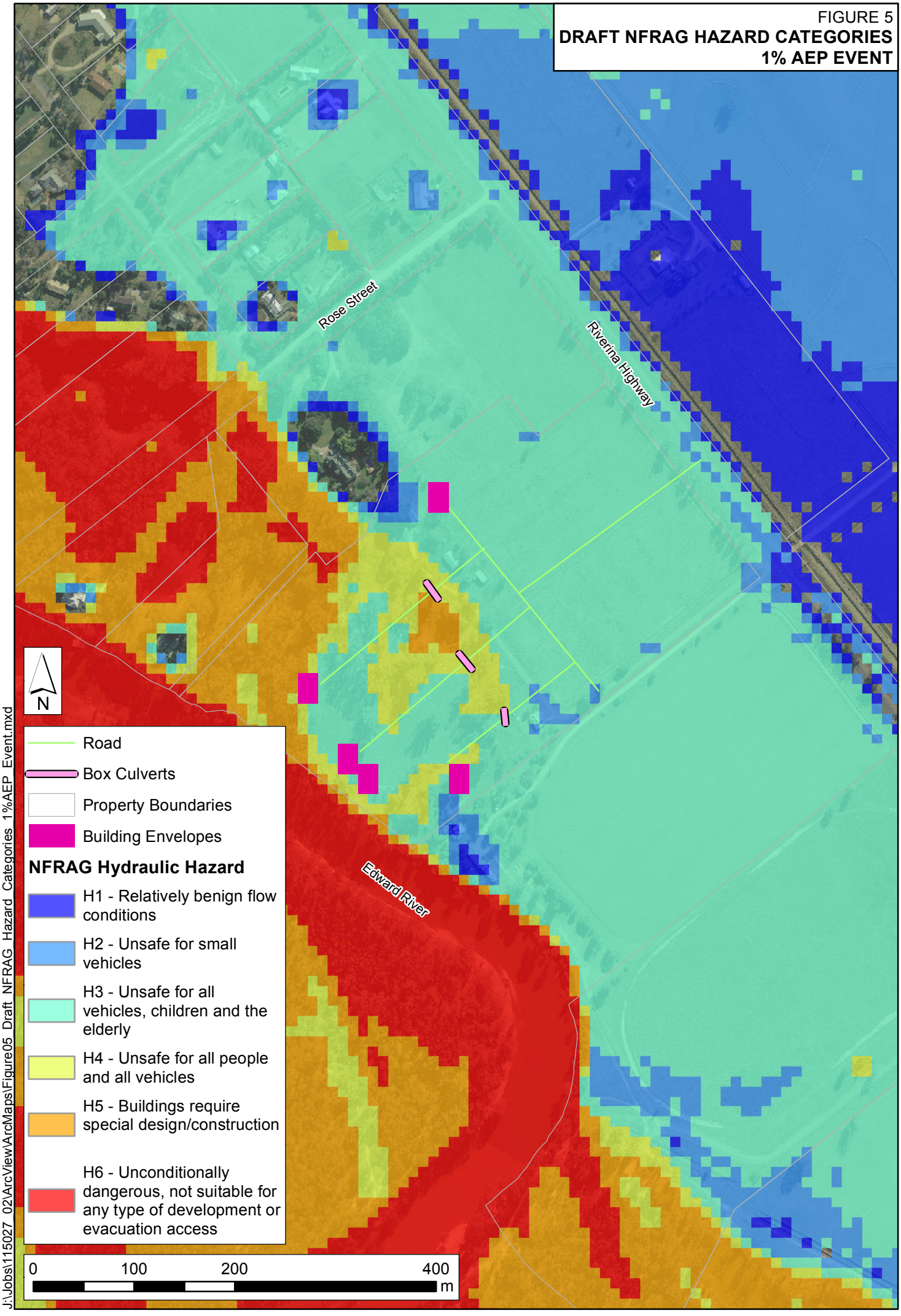


FIGURE 4
EXISTING FLOOD BEHAVIOUR
HYDRAULIC CATEGORISATION
1% AEP EVENT
Rose Street
Riverina Highway
Edward River
N
Road
Box Culverts
Property Boundaries
Building Envelopes
Hydraulic Categorisation
Floodway
Flood Storage
Flood Fringe
0
100
200
400
m
J:\Jobs\115027 02\ArcView\ArcMaps\Figure04 Hydraulic Categories 1%AEP Event.mxd

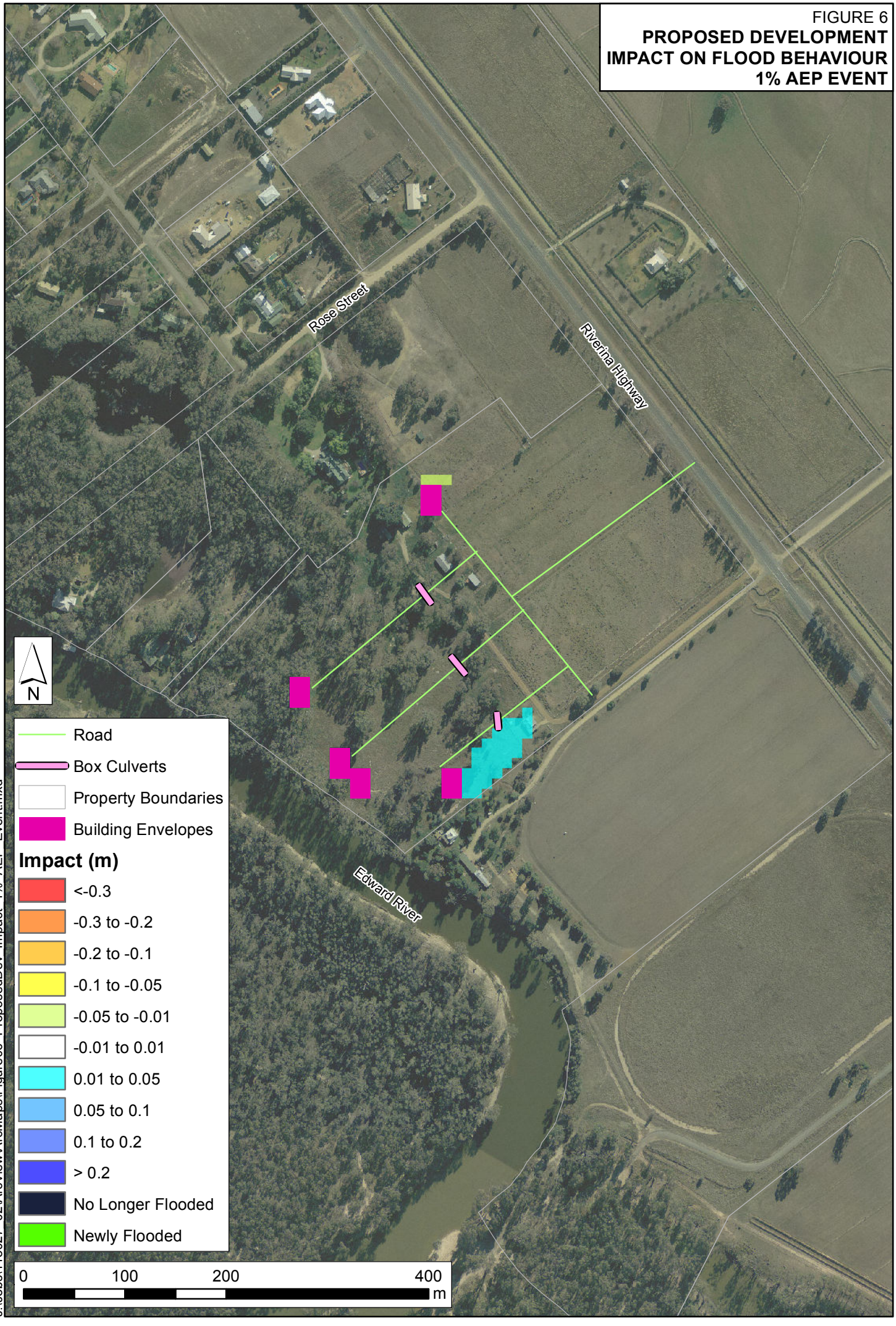
FIGURE 5

**DRAFT NFRAG HAZARD CATEGORIES**
**1% AEP EVENT**




J:\Jobs\115027 02\ArcView\ArcMaps\Figure05 Draft NFRAG Hazard Categories 1%AEP Event.mxd

FIGURE 6
**PROPOSED DEVELOPMENT**
**IMPACT ON FLOOD BEHAVIOUR**
**1% AEP EVENT**




J:\Jobs\115027 02\ArcView\ArcMaps\Figure06 ProposedDev Impact 1% AEP Event.mxd

# Appendix 7

**Extract from Draft Deniliquin Floodplain Risk Management Study and Plan (WMAwater 2016)**

# 8. FREEBOARD ASSESSMENT FOR DENILIQUIN

Mitigation works and planning measures (such as flood planning levels) are often designed based on protection or capacity for a particular design flood event, such as the 1% AEP event. To provide reasonable certainty that this level of protection is achieved a freeboard is added to the selected design flood level. Freeboard is a factor of safety and can be different for mitigation works and flood planning levels due to the components to be considered. The following components are generally considered:

- Uncertainties in flood level estimates (due to ground survey, design flow accuracy, structure blockage);
- Local variations (surge) in flood level;
- Wind, Wave action and surge;
- Post construction settlement;
- Surface erosion or shrinkage; and
- Changes in the catchment and design estimates over time resulting from climate change, development etc.

The relative level of contribution and likelihood of occurrence for each of these components will vary by measure type and location across the floodplain. For example, surface erosion and shrinkage would not apply to a freeboard for Flood Planning Levels, but would apply to a freeboard for a levee.

This section seeks to identify the various components making up freeboard as they apply to mitigation works (such as levees) and flood planning levels.

## 8.1. Mitigation Works Freeboard Assessment

A number of levee upgrade options have been proposed in Section 9.3.8, and these have included a recommended allowance of freeboard. This section provides information on how freeboard has been calculated for levees and other mitigation works in the Deniliquin floodplain. The estimate here also allows the level of protection afforded by the existing levees to be determined.

Freeboard is incorporated into the final design height of a levee and is expressed as the incremental difference in height between the level of the flood against which the levee is designed to protect, and the design crest level of the levee. The assessment provided is adequate for concept design, however any recommended upgrade works will require a feasibility study including a review of the assigned freeboard components. It is based on the assessment carried out in 1997 by Sinclair Knight Merz in the *Deniliquin Flood Protection Levee Study* (Reference 5) and the *2010 NSW Dept. of Works Wagga Wagga Levee Upgrade Flood Freeboard* (Reference 19). These previous assessments have been used as a starting point for the current assessment, with components modified for the Deniliquin flood context or updated based on more recent modelling.

### 8.1.1. Uncertainties in the Estimated Flood Levels

The determination of flood levels comprises a number of factors and parameters, each containing a degree of uncertainty. These factors may include:

- How well the theoretical ARI-Discharge curve fits known flood events;
- Availability of detailed survey and other topographic data;
- Reliability of historical flood data;
- Estimated parameters including afflux, surface roughness, evapotranspiration, rainfall patterns etc.

These uncertainties can have localised or cumulative effects on the accuracy of hydrologic and hydraulic modelling, and hence, the resulting design flood levels produced. A component of the freeboard accounts for this compromise in confidence in the design flood levels. Uncertainties in flood level estimates can be determined through an analysis of the sensitivity of design flood levels to changes in various modelling assumptions. A sensitivity analysis was undertaken as part of the *Edward River at Deniliquin Flood Study 2015* (Reference 2). The results showed that the flood level estimates were relatively insensitive to changes in model assumptions with results generally fluctuating +/- 0.15 m up to a maximum of 0.3 m at isolated locations. A value of **0.15 m** has been assigned to uncertainties in estimated flood levels. This value is also supported by the relative small scale between events of different magnitudes; there is typically 0.1 m between the 1% AEP and 0.2% AEP event and a maximum of 0.9 m between the 1% AEP and the PMF.

### 8.1.2. Local Water Surge

Local flood water levels can be higher than the general flood level due to local blockages or obstructions in the floodplain, or if the levee alignment is oblique to the direction of the flow. Results of flood modelling can be used to understand the sensitivity of design flood levels to these influences. The impacts of blockage were considered as part of the sensitivity analysis undertaken in Reference 2; the results showed a very minor fluctuation in flood level of less than +/- 0.1 m. A local surge allowance of **0.1 m** (conservatively) has been included in the freeboard calculation to allow for this.

### 8.1.3. Wave Action

Where the levee is exposed to a large expanse of flood water, significant waves can be generated under windy conditions and may overtop the levee. Design wave actions are a product of:

- Fetch – the distance the wave is assumed to travel;
- Design wind;
- Wave Height;
- Wind Set-up, and
- Wave Run-up – when a wave reaches a sloping embankment (e.g. levee) it will break on the embankment and run up the slope. Run-up would not apply to flood planning levels.

Based on the conditions present in Deniliquin the effect of wave action including wave run-up has been estimated as **0.4 m.**

### 8.1.4. Embankment Settlement

The levee settlement component allows for the normal post-construction settlement of earthfill embankment levees. In most cases, earthfill embankment levees are constructed with a reasonable degree of compaction and post-construction settlement may be expected to be in the order of 1% of the height of the levee. A post construction settlement allowance for earthfill embankments is proposed as **0.025 m**. Given the age of levees in Deniliquin it is unlikely that further significant settlement would occur, however any upgraded sections would be susceptible to post construction settlement and compaction under traffic. Concrete sections of a levee are not expected to experience any significant settlement. Embankment settlement would not apply to flood planning levels.

### 8.1.5. Defects in Mitigation Works

Levees of earthfill embankment construction are prone to defects and require ongoing maintenance. This component allows for the following defects, and may be reduced with a thorough ongoing maintenance schedule:

- Erosion – dependent on condition of the levee, compaction, type of material used, quality of construction and surface protection (gravel crest, grass cover on batters etc.);
- Holes – due to burrowing animals, dispersion cavities etc., holes may foster piping through the levee;
- Low points – caused by concentrated animal, pedestrian and vehicular traffic;
- Cracking – poses a risk of piping depending on levee material, moisture content and maintenance;
- Regular Maintenance – to reduce or eliminate the risk of levee progressive failure from defects and compensate for settlement of embankments; and
- Defect Allowance – allowing for poor ongoing levee maintenance by including a greater design freeboard. The better the maintenance the smaller this component may be.

For a well maintained embankment, a freeboard component of **0.1 m** is considered appropriate. Defects would not apply to flood planning levels.

### 8.1.6. Climate Change

The Floodplain Development Manual (Reference 1) indicates that climate change should be considered in the development and implementation of floodplain risk management works, to ensure that the level of protection can be maintained under future conditions.

The impacts of climate change on flood producing rainfall events will have a flow on effect on flood behaviour. This may result in key flood levels being reached more frequently, and floods of the same ARI being of a larger magnitude. The freeboard allowance required to cater for climate change is greatly affected by the uncertainties in future model projections, and is therefore somewhat of an estimation. The impacts of climate change projections were assessed as part of Reference 2 and a freeboard component of **0.1 m** is considered appropriate.

### 8.1.7. Summary of Mitigation Work Freeboard Components

Each of the components described above combine to provide an estimate of the freeboard required. They are however unlikely to occur simultaneously, and therefore a relative probability of occurrence has been included when determining the overall freeboard size in Table 15 overleaf. This preliminary assessment has been undertaken for the purposes of this Floodplain Risk Management Study and the initial identification and assessment of mitigation works. The assigned values may be revised as part of future detailed investigations of individual works.

Table 15 Summary of Mitigation Work Freeboard Components

| Component | Allowance (m) | Probability | Final Component (m) |
|---|---|---|---|
| Uncertainties in Flood Model | 0.15 | 1.0 | 0.15 |
| Local Water Surge | 0.1 | 0.75 | 0.075 |
| Wave Action | 0.4 | 0.5 | 0.2 |
| Levee Settlement | 0.025 | 0.5 | 0.0125 |
| Defects in Embankment | 0.1 | 0.5 | 0.05 |
| Climate Change | 0.1 | 1 | 0.1 |
| **Total** | | | **0.5875 (0.5 – 0.6)** |

A recommended freeboard for well-constructed and maintained levees in NSW is generally between 0.6 m and 1.0 m and a minimum freeboard of 0.6 m has been adopted across the region for recent levee projects. Consideration of factors specific to Deniliquin in the above assessment has shown that an appropriate freeboard for mitigation works is between 0.5 and 0.6 m, consistent with recent regional levee projects. In addition, given the recent upgrade of the levee system (with an adopted freeboard of 0.5 m) and limited scale between flood events of different magnitudes, a freeboard of 0.5 m has been adopted for the purposes of planning and analysis of mitigation works as part of this Floodplain Risk Management Study. This should be reviewed as part of future detailed design.

## 8.2. Summary of Flood Planning Level Freeboard Components

A similar approach is taken to determining the freeboard to be included in the Flood Planning Level (FPL). A FPL is assigned to new development, it is the minimum floor level to be built and aims to reduce the likelihood of flood damage occurring to an acceptable level. The freeboard for FPL does not need to include the components related directly to embankment construction (including settlement and defects), however wave action (excluding run up) and local water surge are still applicable. The freeboard components and their relative probability are included in Table 16 below.

Table 16 Summary of Freeboard Components (FPL)

| Component | Allowance (m) | Probability | Final Component (m) |
|---|---|---|---|
| Uncertainties in Flood Model | 0.15 | 1.0 | 0.15 |
| Local Water Surge | 0.1 | 0.75 | 0.075 |
| Wave Action (excluding run-up) | 0.15 | 0.5 | 0.075 |
| Climate Change | 0.1 | 1 | 0.1 |
| **Total** | | | **0.4 (0.3 – 0.4)** |

Considering these components as they apply at Deniliquin, the above assessment shows that an appropriate freeboard for flood planning levels is between 0.3 and 0.4 m.

When determining a FPL freeboard for new development, in addition to considering the components described above, a number of other factors such as the extent of the subsequent Flood Planning Area (FPA) should be considered. The extent of the FPA is the land at or below the FPL. The boundaries of this extent are important to ensure flood related planning controls are applied where necessary and not to those lots with minimal or no flood risk. Typically, and as per the Floodplain Development Manual, the FPA will be based on the extent formed by the 1% AEP mainstream flooding event plus freeboard (typically 0.5 m) and, therefore, extended further than the extent of the 1% AEP event. Planning controls may, therefore, be applied to development which is not necessarily within the 1% AEP flood extent but included in the FPA. The inclusion of freeboard provides greater confidence that a 1% AEP level of protection will be maintain accounting for the uncertainties that make up the design flood level. They key is to ensure that this additional extent is appropriate given the flood risk that exists.

The flat topography of the Study Area has a significant impact on the flood behaviour in Deniliquin. Over 80% of the 100 km$^2$ Study Area is between 89 and 94.5 mAHD, and a section taken laterally across the floodplain generally has a gradient of less than 0.1%. The floodplain does not exhibit the more conventional river valley shape and flow that breaks out of the riparian zone spreads out over a wide area at shallow depth. This results in only slight variations in height (Refer to Table 17) and extent between events of different magnitude and a significantly larger event is required to substantially change the flood extent.

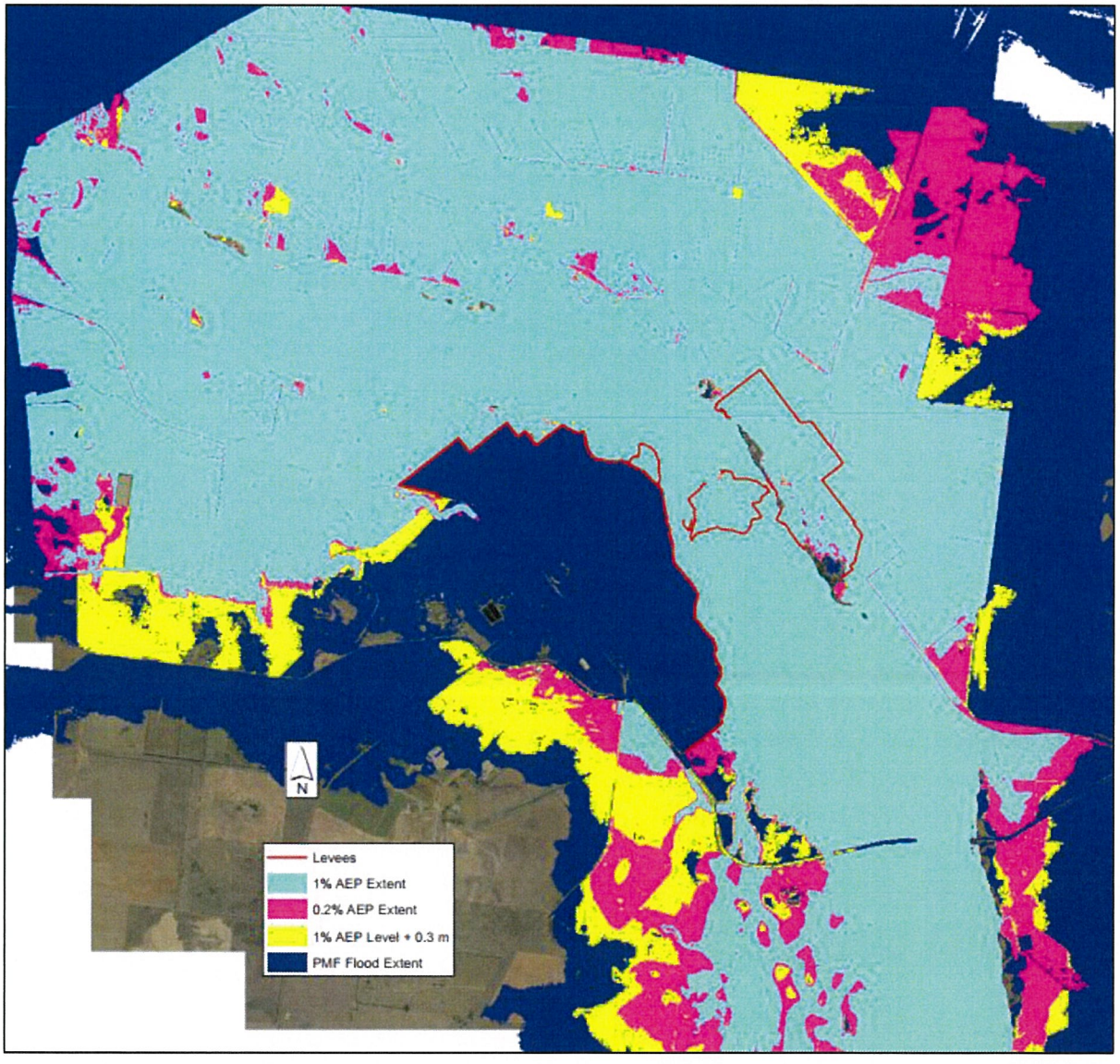
Table 17 Change in Peak Flood Level

| | Peak Flood Level (mAHD) | Difference in Peak Flood Level from 1% AEP (m) | | |
|---|---|---|---|---|
| *Location* | *1% AEP* | *0.5% AEP* | *0.2% AEP* | *PMF* |
| **National Bridge** | 92.3 | 0.1 | 0.2 | 0.8 |
| **Gauge Location** | 92.5 | 0.1 | 0.2 | 0.9 |
| **Brick Kiln Creek Bridge** | 92.5 | 0.2 | 0.2 | 0.8 |
| **River @ Burton St** | 91.6 | 0.1 | 0.2 | 0.6 |
| **Tarangle Creek @Ross St** | 92.8 | 0.1 | 0.2 | 0.9 |
| **River @ Lawson Syphon** | 93.4 | 0.2 | 0.3 | 1.3 |
| **River @ Boggy Creek Rd** | 91.2 | 0.1 | 0.1 | 0.5 |

Traditionally, the selected freeboard is added to the 1% AEP extent to slightly stretch the extent to the FPA. Considering the flood behaviour at Deniliquin, applying this method with a 0.5 m freeboard would include a large proportion of the floodplain, an additional 50% area and some areas beyond the extent of the PMF or flood liable land. It is unlikely that the freeboard components discussed in Section 8.1 would combine to generate such a broad extent of inundation without the event being much rarer. The extent generated by the 1% AEP + 0.5 m freeboard therefore does not capture and exaggerates the intended purpose of the freeboard in the FPA. An excessively large FPA would exaggerate the flood risk and potentially restrict development on the edges of the floodplain.

The extent of the FPA should be representative of a real flood extent that could occur considering the freeboard components and the location specific flood behaviour. The 0.2% AEP extent is considered to be a reasonable representation of this extent. The extent of the 0.2% AEP is shown on Diagram 1 compared to the 1% AEP, 1% AEP + 0.3 m and PMF extent.

Diagram 1 Comparison of design event extents and proposed FPA



The 0.2% AEP event is typically 0.2 – 0.3 m higher than the 1% AEP event and additionally the extent is approximated well by the 1% AEP + 0.3 m freeboard. This is shown on Figure 17.

Consideration of the various freeboard components and the flood behaviour at Deniliquin indicates that a freeboard of 0.3 m would be suitable to be used in determining the FPA. Recommendations regarding the FPL and FPA are discussed in Section 9.3.1.

### 9.2.4. Voluntary House Raising

Voluntary house raising (VHR) seeks to reduce the frequency of exposure to flood damage of the house and its contents by raising the house above the minimum Flood Planning Level (FPL), and accordingly reduce the frequency of household disruption and associated trauma and anxiety. VHR is eligible for OEH funding based on eligibility criteria set out in the OEH Guidelines for Voluntary House Raising Schemes (Reference 17). VHR was considered for the Davidson Street area as it may be of benefit to some residences, however VHR is inappropriate in a floodway and does not meet the guideline requirements and so was not considered further.

## 9.3. Catchment-wide Management Options

Catchment-wide management options, include property modification and response modification options. The options considered include:

- Property modification options:
  - Flood planning levels for the area based on review of the current FPL and FPA, flood behaviour (e.g. scaling between events) and freeboard components (PM01);
  - Floodplain management via development control planning, including possible changes to the existing plans based on a review. Possible changes include stipulation of when impact assessment is required, where flood compatible materials should be used, and consideration of study outputs (e.g. PMF extent, hydraulic categories, true hazard) in development of land (PM02);
  - Notification of flood affectation on an individual lot bases via s149 certificates (PM03); and
  - Voluntary Purchase (PM04);
- Response modification options:
  - Amendments to the local flood plan and other emergency response documents based on review of its recommended procedures, including flood warning and evacuation (RM01, RM02 & RM03); and
  - Community awareness program to increase knowledge of flooding and its effects in the area, installation of depth gauge and historical flood markers (RM04).

The report will also make recommendations as to which options should be undertaken and their relative benefits.

### 9.3.1. Property Modification – Revision of Flood Planning Level and Flood Planning Area (PM01)

Flood Planning Levels (FPLs) are an important tool in floodplain risk management. Appendix K of the Floodplain Development Manual (Reference 1) provides a comprehensive guide to the purpose and determination of FPLs. The FPL provides a development control measure for managing future flood risk and is derived from a combination of a design flood event and a freeboard.

The FPL for planning purposes is generally the height at which new building floor levels should be built to minimise frequency of inundation and associated damage. It may also refer to the height to which flood proofing should be applied to reduce damages to commercial properties. It applies to properties in the Flood Planning Area (FPA), which is typically the land at or below the flood planning level. The Flood Planning Area (FPA) is an area within Council's LGA to which flood planning controls are applied. It is important to define the boundaries of the FPA to ensure flood related planning controls are applied where necessary and not to those lots unaffected by flood risk. It is also important to define the FPA on criteria as per the NSW Floodplain Development Manual (Reference 1).

Due to the mixture of residential and commercial development in the Study Area, a variety of FPLs may be applicable depending on where in the catchment development is being considered and also based on the type of development being proposed.

A variety of factors need to be considered when calculating the FPL for an area. A key consideration is the flood behaviour and resultant risk to life and property. The Floodplain Development Manual identifies the following issues to be considered:

- Risk to life;
- Long term strategic plan for land use near and on the floodplain;
- Existing and potential land use;
- Current flood level used for planning purposes;
- Land availability and its needs;
- FPL for flood modification measures (levee banks etc.);
- Changes in potential flood damages caused by selecting a particular flood planning level;
- Consequences of floods larger than that selected for the FPL;
- Environmental issues along the flood corridor;
- Flood warning, emergency response and evacuation issues;
- Flood readiness of the community (both present and future);
- Possibility of creating a false sense of security within the community;
- Land values and social equity;
- Potential impact of future development on flooding; and
- Duty of care.

As a guide, Table 19 has been reproduced from the NSW Floodplain Development Manual 2005 to indicate the likelihood of the occurrence of an event in an average lifetime to indicate the potential risk to life.

Analysis of the data presented in Table 19 gives a perspective on the frequency of floods being exceeded over an average lifetime. The data indicates that there is a 50% chance of a 100 Year ARI (1% AEP) event occurring at least once in a 70 year period. Given this potential, it is reasonable from a risk management perspective to give further consideration to the adoption of the 1% AEP flood event as the basis for the FPL. Given the social issues associated with a flood event, and the non-tangible effects such as stress and trauma, it is appropriate to limit the exposure of people to floods.

Note that there still remains a 30% chance of exposure to at least one flood of a 200 Year ARI (0.5% AEP) magnitude over a 70 year period. This gives rise to the consideration of the adoption of a rarer flood event (such as the PMF) as the flood planning level for some types of more vulnerable development.

Table 19: Likelihood of given design events occurring in a period of 70 years

| Likelihood of Occurrence in Any Year (ARI) | Probability of Experiencing At Least One Event in 70 Years (%) | Probability of Experiencing At Least Two Events in 70 Years (%) |
|---|---|---|
| **10** | 99.9 | 99.3 |
| **20** | 97 | 86 |
| **50** | 75 | 41 |
| **100** | 50 | 16 |
| **200** | 30 | 5 |

The Floodplain Development Manual states that the FPL for standard residential development is the 1% AEP flood event plus a freeboard which is typically 0.5 m. Depending on the nature of the development and the level of flood risk, individual FPLs can be adopted for a local area within a greater floodplain area.

The FPL can be varied depending on the use, and the vulnerability of the building/development to flooding. For example, residential development could be considered more vulnerable due to people being present or its location, whilst commercial development could be considered less vulnerable, or it could be accepted that commercial property owners are willing to take a higher risk. For developments more vulnerable to flooding (hospitals, schools, electricity sub-stations, seniors housing and the like) consideration should be given to events rarer than the 1% AEP when determining their FPL and either consider the PMF or situating those developments outside the floodplain where possible.

For the less vulnerable commercial and industrial developments, flood proofing a building to the FPL can be considered where raising floor levels is not an option or not feasible, but should not be allowed for residential developments or more vulnerable uses. For example, it could be a requirement that residential dwellings are to have floor levels above the FPL, whilst commercial properties could have lower floor levels but be subject to other controls such as flood proofing to the level of the FPL.

More sensitive land uses such as nursing homes, hospitals and childcare centres and the like should ideally be located outside of the FPA and above the PMF.

Weighing up the range of factors discussed above in addition to those described in the freeboard assessment presented in Section 8 an appropriate FPL for Deniliquin would be the 1% AEP flood level plus 0.3 m freeboard for residential development in those areas outside the floodway (Refer to Figure 6). It is also appropriate that a higher freeboard (0.5 m) is applied to the replacement of existing dwellings in the floodway including Davidson Street.

The Flood Planning Area (FPA) is an area to which flood planning controls are applied. The FPA should be the extent of the 1% AEP + 0.3m.

The level of protection provided by the existing levees affect the extent of the FPA, for example it can be said that the South Deniliquin levee generally provides a 1% AEP level of protection (refer to Section 4.5.1.3 and Section 8) and therefore these areas are not included within the FPA and therefore a FPL will not apply to residential development. At present the North Deniliquin levee does not provide protection in the 1% AEP event and therefore will be included in the FPA. Should the North Deniliquin levee be upgraded to a 1% AEP level of protection (including the recommended freeboard) then it would be excluded from the FPA.

Council's Flood Planning Levels Policy 5.9 provides guidance on flood level controls and is enforced by controls included in the DCP. This policy requires updating in accordance with the recommendations included in this section.

| | |
|---|---|
| ☑ | **PM01 Recommendation**<br>• Mapping should be utilised to inform the FPA and FPLs set for all residential development on land that exists within the FPA.<br>• Include floor level controls for sensitive uses.<br>• Allow flood proofing to the FPL for non-residential developments.<br>• Update the FPA (and related documentation) to reflect the extent of the 1% AEP event + 0.3 m freeboard.<br>• Update the FPL (and related documentation) for non-floodway areas to be 1% AEP event + 0.3 m freeboard.<br>• Update the FPL (and related documentation) for replacement of existing dwellings in floodway areas to be 1% AEP event + 0.5 m freeboard.<br>• Apply a FPL of 1% AEP event + 0.3 m freeboard in the areas protected by the North Deniliquin levee until upgraded.<br>• These changes will require a Planning Proposal and additional notations included in s149 certificates for properties within the FPA (Refer Section 0). |

### 9.3.2. Property Modification – Planning Policy Review (PM02)

Appropriate land use planning can reduce future flood risk and associated flood damages by ensuring that development is compatible with flood risk. Planning instruments can be used as tools to:

- Guide new development away from high flood risk locations;
- Prevent inappropriate development from occurring;
- Ensure that new development does not increase flood risk elsewhere; and
- Develop appropriate evacuation and disaster management plans to better reduce flood risks to the existing population.

# Appendix 8

**Aboriginal Heritage Due Diligence Assessment**
**Kyalite Stables Deniliquin Due Diligence**
**(NGHenvironmental, August 2016)**

# Aboriginal Heritage Due Diligence Assessment

## KYALITE STABLES DENILIQUIN DUE DILIGENCE

AUGUST 2016

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## Document Verification

Project Title: Kyalite Stables Deniliquin Due Diligence

| | |
|---|---|
| Project Number: | 16-135 |
| Project File Name: | 16-135 Kyalite-Deniliquin Due Dil 030816 |

| Revision | Date | Prepared by (name) | Reviewed by (name) | Approved by (name) |
|---|---|---|---|---|
| Draft | 5/08/16 | Kirsten Bradley | Matthew Barber | Matthew Barber |
| | | | | |
| | | | | |
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# CONTENTS



## TABLES



## FIGURES



## PLATES

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AHIMS | Aboriginal heritage information management system |
| Km | kilometres |
| LALC | Local Aboriginal Land Council |
| M | Metres |
| NPW Act | *National Parks And Wildlife Act 1974* (NSW) |
| NSW | New South Wales |
| OEH | (NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water |
| PAD | Potential Archaeological Deposit |
| REF | Review of Environmental Factors |

# EXECUTIVE SUMMARY

## BACKGROUND ASSESSMENT

No sites are registered with AHIMS within the proposed project area for the rezoning and residential development of Lots 2 and 3/DP 562598 and Lot 1/DP 1121183 in Deniliquin. However, 23 sites have been recorded in the general vicinity. The terrain features within the project area have the potential to be of high archaeological sensitivity based on the proximity to Edward River which runs adjacent to the south-western boundary. This is in accordance with the landscape model provided in the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* which outlines that areas within 200m of water have higher potential to contain Aboriginal objects.

## FIELD ASSESSMENT

The field inspection assessed the project area as having negligible potential to contain Aboriginal objects and no Aboriginal artefacts were identified. Mature trees within the vicinity of the project area were visually inspected and considered not to be culturally modified.

## IMPACT ASSESSMENT CONCLUSION

The current field assessment, combined with the result of the desktop research conclude that the proposed rezoning and residential development of Lots 2 and 3/DP 562598 and Lot 1/DP 1121183 in Deniliquin is unlikely to impact Aboriginal heritage objects. The project area assessed in this report does not require further assessment for Aboriginal sites and objects and the activity can proceed with caution.

## RECOMMENDATIONS

The proposed work can *proceed with caution*, provided the following recommendations are followed:

1. The proposed rezoning and residential development should remain limited to Lots 2 and 3/DP 562598 and Lot 1/DP 1121183 as assessed in the current report so as to limit the possibility of encountering Aboriginal objects or culturally modified trees in unassessed areas;
2. Any activity proposed outside of the current assessment area should also be subject to an Aboriginal heritage assessment; and
3. If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and OEH notified. The find will need to be assessed and if found to be an Aboriginal object an AHIP may be required.

# 1 INTRODUCTION

NGH Environmental was commissioned by Edward River Council to undertake a Due Diligence level assessment for Aboriginal heritage sites within Lots 2 and 3/DP 562598 and Lot 1/DP 1121183, at 21701-21703 Riverina Highway, Deniliquin, NSW that are proposed for rezoning and residential development (Figure 1).

The area of investigation comprises of approximately 13.3 ha and is situated between the Riverina Highway and the Edward River on the eastern edge of Deniliquin (Figure 2). NGH Environmental are preparing a Review of Environmental Factors (REF) for the project. This Due Diligence assessment forms part of the REF.

The rationale for the work is to address concerns raised by OEH prior to rezoning land adjacent to the Edward River.

## 1.1 PROJECT PARTICIPANTS

The Due Diligence assessment was carried out by qualified archaeologist Kirsten Bradley of NGH Environmental. This included background research, field inspection and the completion of this report.

The Due Diligence process does not formally require consultation with Aboriginal community groups. No Aboriginal groups were contacted for this due diligence level assessment. The area is within the boundaries of the Deniliquin Local Aboriginal Land Council.

## 1.2 FORMAT OF THIS REPORT

This report has been drafted in keeping with the sequence of steps identified in the NSW Office of Environment and Heritage's (OEH) *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (OEH 2010). The Code of Practice provides a five step approach to determine if an activity is likely to cause harm to an Aboriginal object, as defined by the *NSW National Parks and Wildlife Act* (1974). The steps follow a logical sequence of questions, the answer to each question determines the need for the next step in the process.

The progress through the steps in the Code of Practice is aimed at providing an assessment of the potential for an activity to impact either a known Aboriginal object, or whether it is likely that unrecorded Aboriginal objects are present that may be impacted. The result of the process is aimed at providing the proponent with information about the likelihood that their activity will impact an Aboriginal object and whether an Aboriginal Heritage Impact Permit may be required.

Each section below follows the relevant step outlined in the Code of Practice.

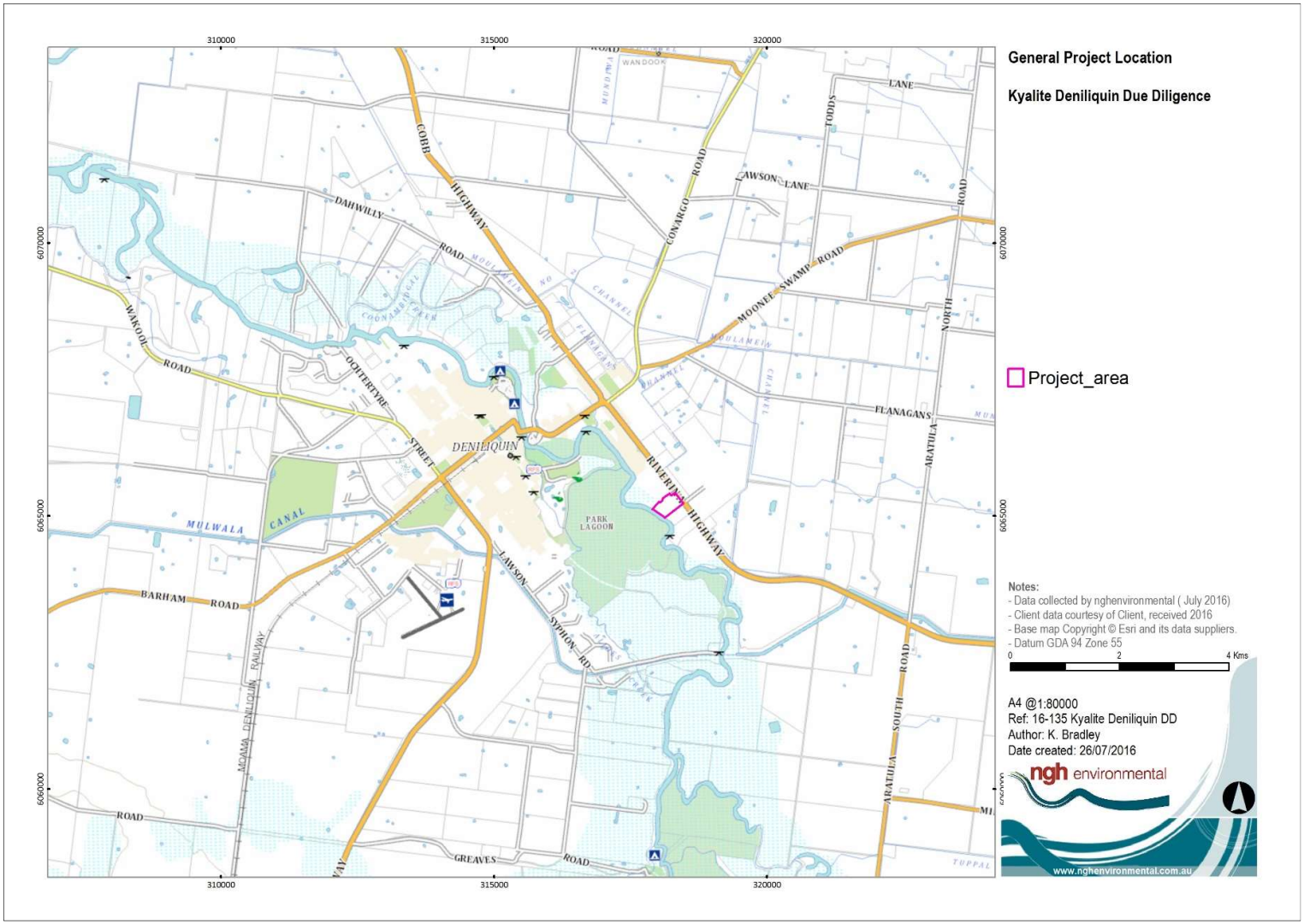


Figure 1. General project location.

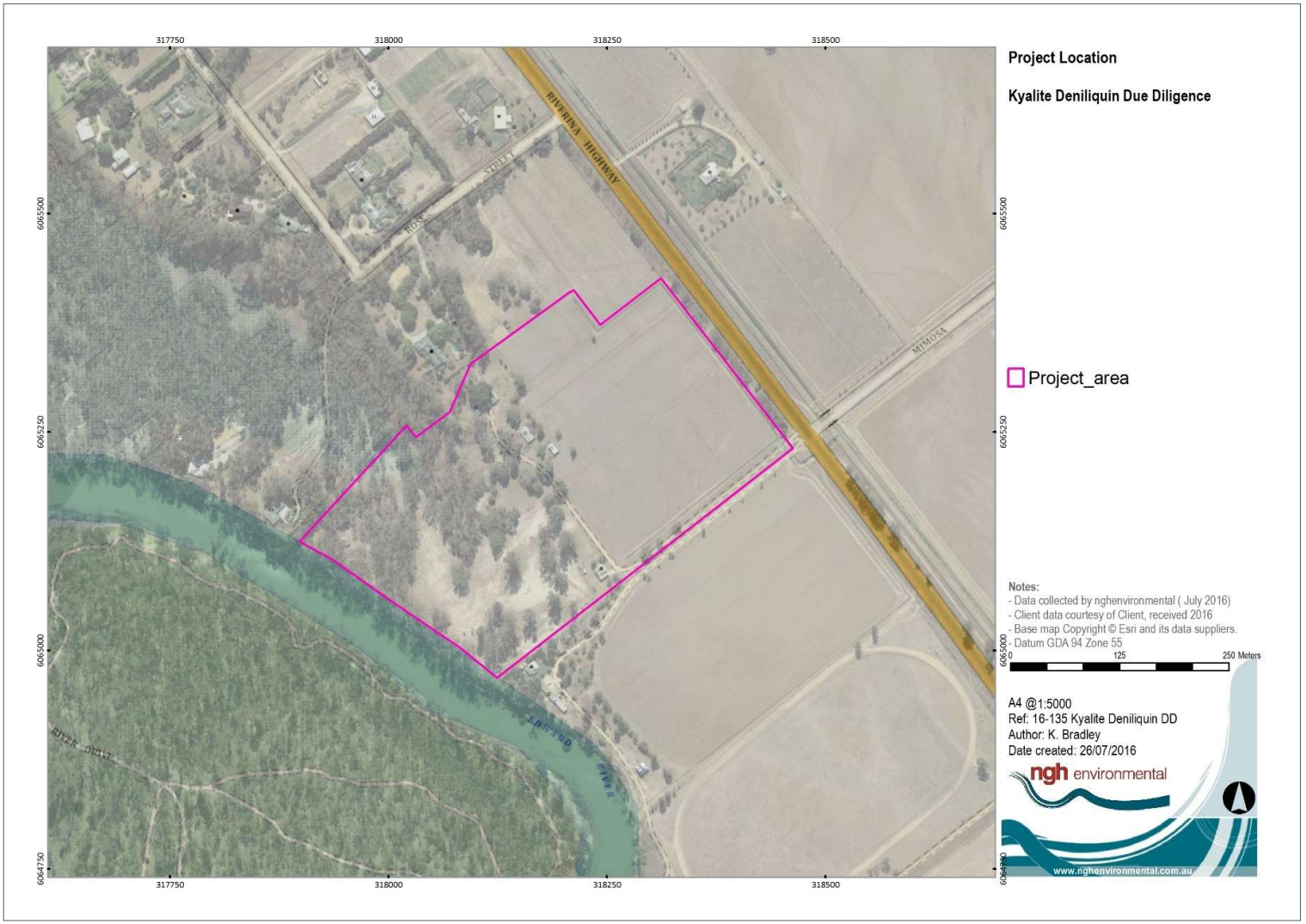


Figure 2. Project location.

# 2 GROUND DISTURBANCE

***Step 1. Will the activity disturb the ground surface or any culturally modified trees?***

The proposed rezoning and residential development of Lots 2 and 3/DP 562598 and Lot 1/DP 1121183 would involve the following elements:

- Installation of utilities;
- Construction of houses;
- Fencing;
- Creating access pathways/driveways; and
- Clearing of fire protection zones.

The affirmation that ground disturbance will occur requires the next step in the Due Diligence process.

# 3 REGISTER SEARCH AND LANDSCAPE ASSESSMENT

***Step 2a. Search the AHIMS Database and other information sources***

A search of relevant heritage registers for Aboriginal sites and places provides an indication of the presence of previously recorded sites. A register search is not conclusive however, as it requires that an area has been inspected and any site locations are provided to the relevant body to add to the register. However, as a starting point, the search will indicate whether any sites are known within or adjacent to the investigation area.

The Aboriginal Heritage Information Management System (AHIMS) is maintained by OEH and provides a database of previously recorded Aboriginal heritage sites. A search provides basic information about any sites previously identified within a search area. The results of the search are able to relied upon for 12 months for the purposes of a due diligence level assessment.

A search of the AHIMS database of an area approximately 5km east-west by 5km north-south, centred on the Lots being assessed, was undertaken on the 2nd of July 2016. The coordinates for the search area were Lat. Long. from: -35.5789, 144.9267 – Lat. Long to: -35.5023, 145.0483 with a buffer of 50 meters. The AHIMS Client Service Number was: 232318. There were 23 Aboriginal sites recorded within this search area and no declared Aboriginal Places. Table 1 shows the breakdown of site types and Figure 3 show the location of the AHIMS sites to the project area.

Table 1 Breakdown of previously recorded Aboriginal sites in the region.

| Site Type | Number |
|---|---|
| Earth Mound, Hearth, Modified tree | 2 |
| Burial | 2 |
| Modified Tree | 19 |
| **TOTAL** | **23** |

It is clear from these search results that the dominant site type in the area is modified trees. None of the sites are within or adjacent to the project area. The closest site to the project area is a modified tree approximately 600m away on the opposite bank of the Edward River to the current assessment area.

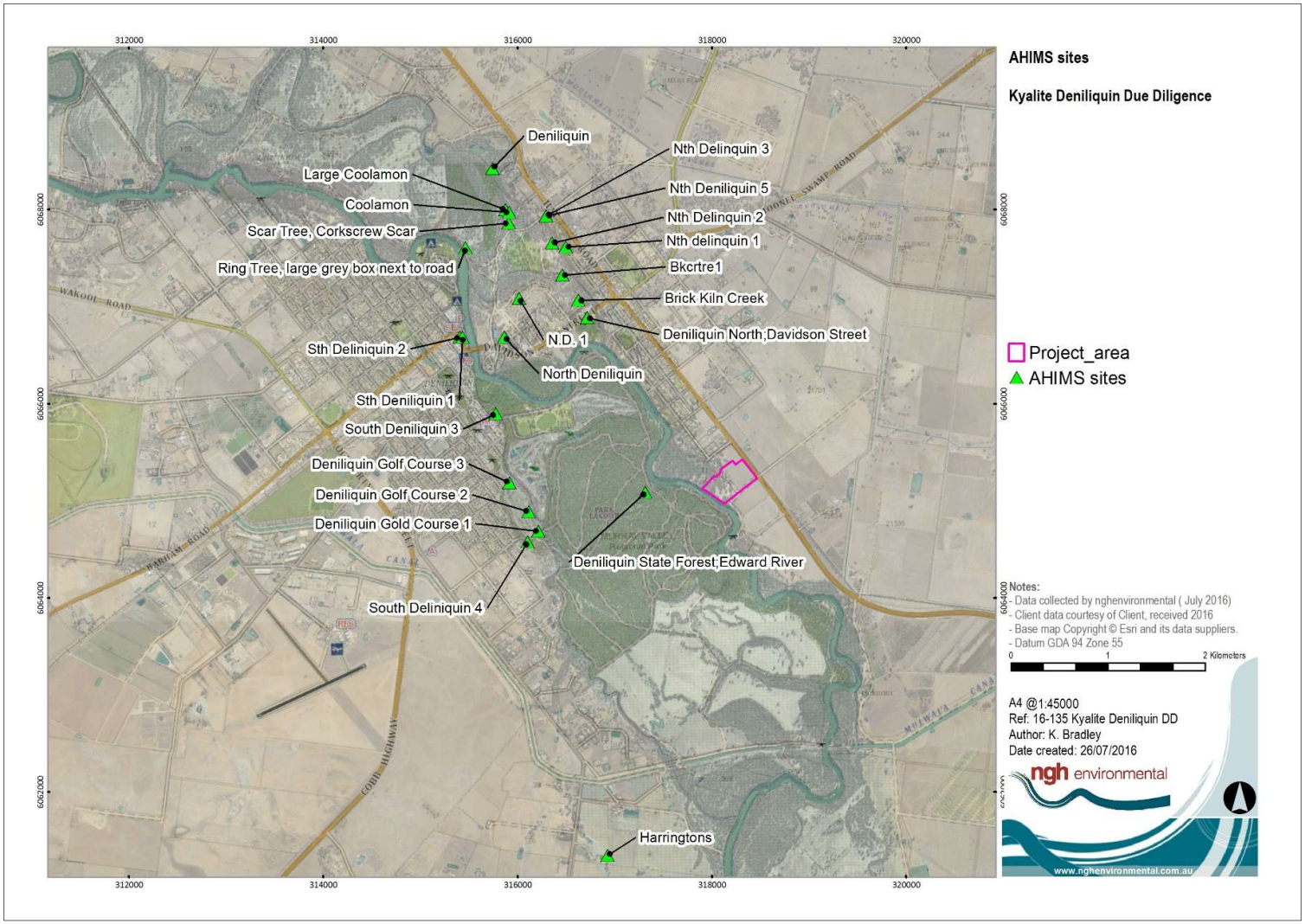


Figure 3. AHIMS sites.

## 3.1 LOCAL ARCHAEOLOGICAL STUDIES

There have been few archaeological studies done in the Deniliquin area and none within the current project area. In 1996 Edmonds conducted a survey in the Deniliquin area that is summarised below.

Edmonds (1996) conducted a pedestrian and vehicular survey of the proposed Stage 2 Levee Banks and Borrow Pits at Deniliquin. Following a review of archaeological studies in the Riverine Plain and Murray Valley area Edmonds predicted that mounds and scarred trees were the most common site types likely to occur. Burials were likely to occur in sand bodies on low alluvial plains. A dominance of scarred trees was predicted given the survey area was predominantly along the river and creek banks. Nine scarred trees and a burial were recorded. The scarred trees were located on River Red Gums along the riverbank and Black Box Trees on the floodplains and fringed depressions. The burial was located to the north of Deniliquin in a source bordering dune. No mounds were located during the survey and the identification of only scarred trees along the riverbank and terraces was suggested to be due to the high level of disturbance of the area.

Within the broader region, a number of surveys have been undertaken that have resulted in a range of Aboriginal site being recorded. The major relevant studies are summarised below.

During the 1970's and 80's archaeological research in the Murray Valley region between the Edward and Murray Rivers tended to focus on burials and mounds (Berry and Frankel 1984, Bonhomme 1997, Simmons 1980). Simmons (1980) identified 75 mounds, 17 scarred trees and a range of other site types including isolated artefacts, hearths, shell middens and burials within the Murray floodplain and along channels. Mounds were the most common site type and generally consisted of abundant clay nodules in association with burnt fragments of shell or bone while the scarred trees were generally all mature River Red Gums. The sites identified by Simmons were all located in close proximity and/or associated with the floodplains, anabranches and lake systems of the Murray Valley and clearly showed the importance of aquatic resources to the local Aboriginal populations in the region.

In 1984 Berryman and Frankel surveyed and excavated mounds beside the Wakool River. A total of 95 mounds and 11 scarred trees were recorded. The mounds were all located along water channels on floodplains and field observations noted a correlation between the dimension of the mound and the size of the associated water body. The mounds ranged in size from 8-48 metres in diameter. Four charcoal samples from three mounds were radio carbon dated with dates ranging between 4160 ±300 Before Present (BP) and 2250 ±105 BP. The early date may represent an anomaly as the charcoal sample tested was from the centre of the mound found in association with a clay ball feature while the basal deposit sampled from the same mound dated to 2490 ±60 BP.

Between 1987-1988 Bonhomme (1993) surveyed the Riverine Plain for locations of Aboriginal burial sites, focusing particularly on burials in sand bodies. The study area was bounded by the Lachlan, Murrumbidgee and Murray Rivers. Known burial sites in the area were reassessed and a number of previously unrecorded sites were identified. During the study a burial (AHIMS# 54-6-10) was recorded to the north of Deniliquin. The burial was located in a source bordering dune approximately 100m north of the Edward River.

Based on a review of the results of archaeological surveys and assessments of the Deniliquin and broader area, it is reasonable to predict that sites in the project area would likely share similar attributes and characteristics with those previously identified in the surrounding area. Based on the reviewed reports, the key attributes taken into consideration to develop the predictive model were that areas of archaeological sensitivity will occur in association with major water sources and relatively intact tracts of riverine Red Gum forest along the floodplains of the major active rivers and creeks, and Black Box fringed depressions. The archaeological sensitivity of source bordering dunes to water sources is also noted, particularly for the

presence of burials. According to these features the current project area adjacent to the Edward River is classified as having high archaeological sensitivity.

***Step 2b. Are there undisturbed landscape features likely to contain Aboriginal objects?***

As outlined above, Aboriginal heritage sites have been recorded in the Deniliquin area and more broadly within the Murray, Edward and Murrumbidgee riverine plains. Although there have been no sites previously recorded within Lots 2 and 3/DP 562598 and Lot 1/DP 1121183, archaeologically sensitive landscapes identified from previous surveys in the region do occur within the project area. Previous archaeological surveys and modelling for the area suggests that the most archaeologically sensitive areas are the relatively intact tracts of riverine Red Gum forest along the floodplains of the major active rivers and creeks. There is also potential for sites within sand dunes and in proximity to water sources such as creeks.

The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* also outlines a range of landscape features that have higher potential to contain Aboriginal objects. It is necessary to consider whether there are landscape features of undisturbed land that may contain Aboriginal objects. These include land that is:

- within 200m of water,
- located within a sand dune system,
- located on a ridge top, ridge line or headland,
- located within 200m below or above a cliff face, or
- within 20m of a cave, rock shelter or cave mouth.

The area of proposed rezoning and residential development is situated adjacent to a major watercourse, the Edward River, and therefore the project comes within 200m of water. The general landscape has been shown to contain modified trees but there is also the potential that mounds and stone artefacts may also occur as the river would have provided a focus for occupation and camping for Aboriginal people. As such this landscape feature generally has a high potential to contain Aboriginal sites.

The desktop and landscape assessment of the proposed area for rezoning and residential development therefore indicates that there are landscapes present, as defined by OEH, and supported by archaeological surveys in this region, that have the potential to contain Aboriginal sites. The next step in the OEH due diligence process is therefore required.

# 4 IMPACT AVOIDANCE

***Step 3. Can any AHIMS listed objects, or landscape features be avoided?***

The area proposed for rezoning and residential development is unlikely to be able to be revised to avoid such landscape features. The desktop assessment alone is not sufficient to conclusively appraise the archaeological potential of the landscape or the location of any sites, the next step in the process, a visual inspection, must be conducted to properly appraise the presence and potential for Aboriginal sites to occur.

# 5 DESKTOP ASSESSMENT AND VISUAL INSPECTION

***Step 4. Does the desktop assessment and visual inspection confirm that there are likely to be Aboriginal objects present or below the ground surface?***

The assessment process is primarily a desktop exercise, using available information such as the AHIMS search results and relevant archaeological reports that have been previously completed in the area. Visual inspection is also required where undisturbed landscape features are present that may contain sites.

A visual inspection of the project area was undertaken on the 2nd of August 2016. The inspection was carried out by qualified archaeologist, Kirsten Bradley. The following provides a summary of the landscape and project area in relation to the archaeological potential for Aboriginal objects to occur.

The Lots proposed for rezoning and residential development can largely be divided into two sections, north-eastern and south-western (Figure 4). The north-eastern section consists of large agricultural paddocks, that have been cleared of all natural vegetation and have been heavily disturbed with irrigation furrows visible. The south-western section is adjacent to the Edward River and has remnant woodland disturbed by clearing and residential houses. A derelict abandoned house is located in the far south-western corner of the project area with rubbish piles of old household items and remnant pieces of concrete, metal, tin and fencing scattered throughout. The project area as a whole was examined and criss-crossed by pedestrian transects during the survey. Ground cover and visibility varied with an average visibility of less than 5% due to a thick grass cover. The average ground visibility along the access track was 80%. Any areas of exposures within the project area were examined during the survey for evidence of Aboriginal objects.

Mature trees adjacent to the Edward River and within Lots 2 and 3/DP 562598 and Lot 1/DP 1121183 were visually inspected. The trees in the project area were predominantly native species of Eucalypts with introduced species generally located in close proximity to the houses and associated infrastructure. For a tree to have been a mature specimen suitable for bark extraction at the time Aboriginal people were last practicing tradition ways, the tree would have to be a native species and over 100 years old. A number of large mature native trees were identified within the project area. While it was evident that there were scars present on a number of the native trees present, the scarring on those trees was considered to be natural as they did not to conform in any way to the standard scarring morphology accepted for Aboriginal modification and therefore were deemed not to be cultural (cf. Long 2005). A number of the scars observed were most likely caused by falling limbs that caused damage to the tree trunk and lower limbs.

The soil across the project area was a grey brown sticky clay, no sandy deposits were identified. While the north-eastern section of the project area was relatively flat the area was found to be heavily modified by agricultural practices and due to this disturbance this section was deemed to have negligible potential to contain Aboriginal objects. No surface Aboriginal artefacts were identified.

A flat terraced feature was identified in the south-western section near the Edward River however it was assessed to have been modified by land clearing. The terrace feature was believed to have been created post European contact and is most likely the result of land clearing rather than a natural feature in the landscape. This area was the only section in the south-western portion devoid of trees, it also has several large spoil heaps of the grey brown clay to the north-west near a large concrete slab. Any exposed areas on the spoil heaps were inspected for cultural material. No cultural material was identified within the clay deposits. It was also noted that this section of the Edward River had a very steep bank that would not have been conducive to sourcing water from the river at this location. In conclusion, the south-western portion

of the project area was deemed to have negligible potential to contain Aboriginal objects with no surface Aboriginal artefacts identified.

Plate 1. View south-west across agricultural paddock.

Plate 2. View north-east across agricultural paddock towards Riverina Highway.

Plate 3. View west along Edward River showing steep bank.

Plate 4. View of dozer push spoil heaps.

Plate 5. View south-west of abandoned house near Edward River.

Plate 6. View south-west across cleared flat area towards the Edward River.

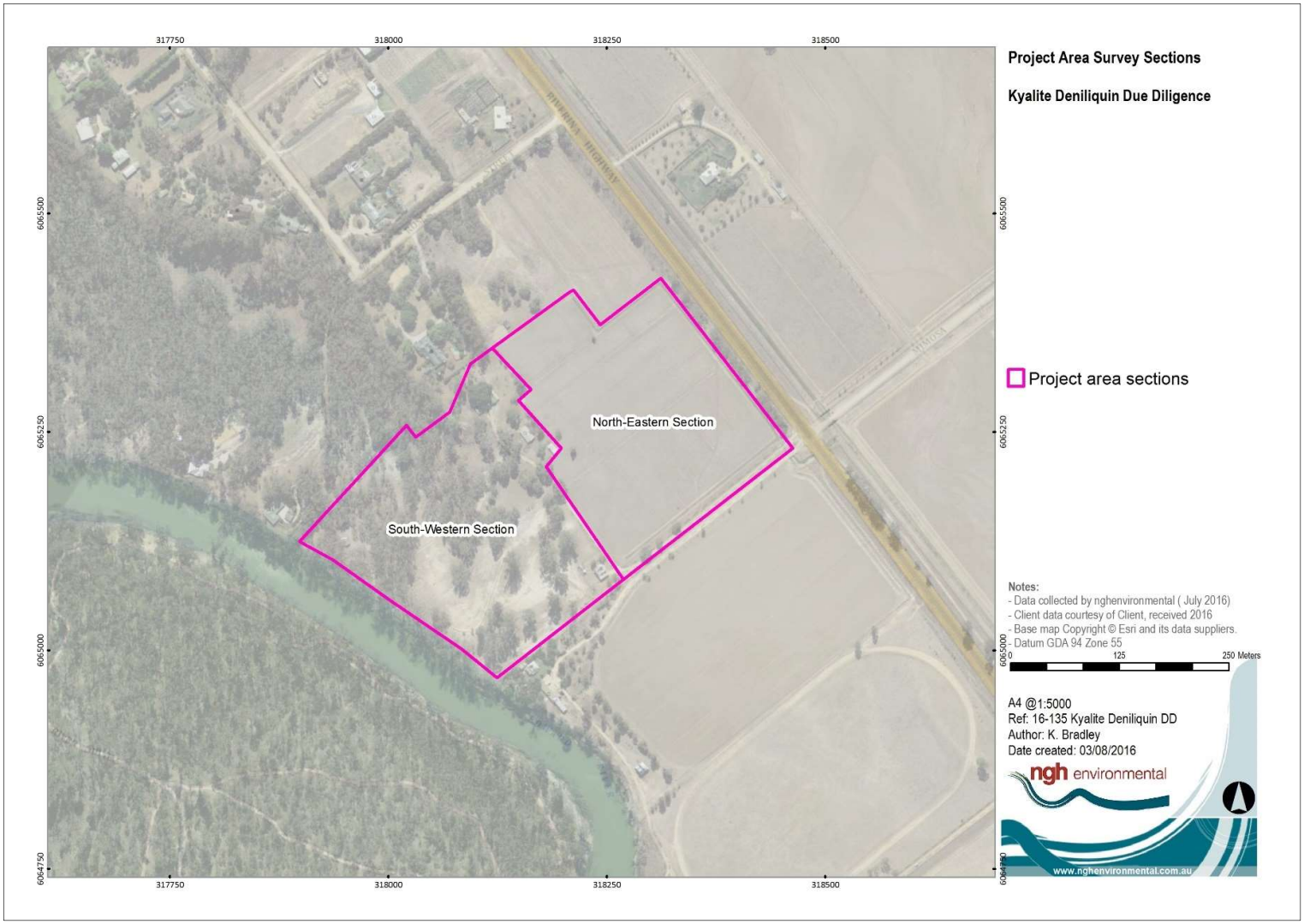


Figure 4. Project area survey sections.

Plate 7. View south-west from large concrete slab away from cleared area.

Plate 8. View south-east along existing track.

Plate 9. View north towards existing residential house on Lot 3/ DP 562598.

Plate 10. View south towards existing residential house on Lot 1/ DP 1121183.

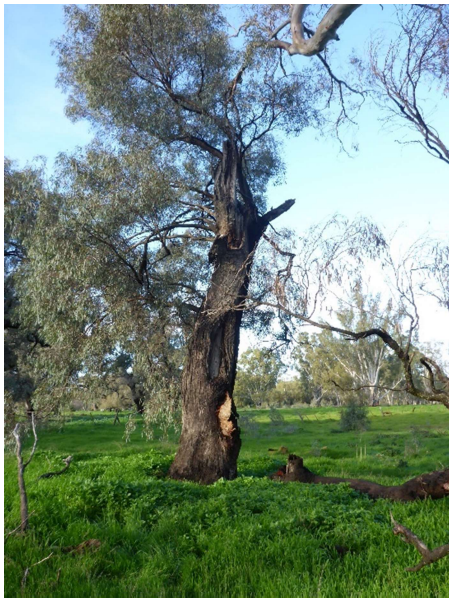

Plate 11. Observed natural scaring on tree.

Plate 12. Observed natural scaring on tree.

# 6 FURTHER ASSESSMENT

***Step 5. Is further investigation or impact assessment required?***

The Due Diligence Code of Practice states that if, after the desktop research and visual inspection is completed, it is evident that harm will occur to Aboriginal objects or heritage places then further and more detailed assessment is required. However, if the research and inspection conclude that there are no, or unlikely to be any, objects impacted by the proposed activity, then the activity can proceed with caution.

The current field assessment, combined with the results of the desktop research have assessed the impact from the proposed rezoning and residential development of Lots 2 and 3/DP 562598 and Lot 1/DP 1121183 in Deniliquin as unlikely to impact Aboriginal heritage objects. The assessment concludes that the proposed area for rezoning and residential development does not require further assessment for Aboriginal sites and objects and can proceed with caution.

# 7 RECOMMENDATIONS

The proposed work can *proceed with caution*, provided the following recommendations are followed:

1. The proposed rezoning and residential development should remain limited to Lots 2 and 3/DP 562598 and Lot 1/DP 1121183 as assessed in the current report so as to limit the possibility of encountering Aboriginal objects or culturally modified trees in unassessed areas;
2. Any activity proposed outside of the current assessment area should also be subject to an Aboriginal heritage assessment; and
3. If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and OEH notified. The find will need to be assessed and if found to be an Aboriginal object an AHIP may be required.

# 8 REFERENCES

Berryman, A. and Frankel, D. 1984 Archaeological investigation of mounds on the Wakool River near Barham, NSW. *Australian Archaeology* 19:21-30.

Bonhomme, T. 1997 *Aboriginal Burial and Sand Mining on the Riverine Plain, NSW*. Report prepared for the NSW National Parks and Wildlife Service.

Edmonds, V. 1996 *An Archaeological Survey of the Proposed Stage II Levee Banks and Burrow Pits at Deniliquin, South-Western, NSW*.

OEH 2010 *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.*

Simmons, S. 1980 Site survey of the floodplains between the Murray and Wakool Rivers, NSW. *Records of the Victorian Archaeological survey 10*: 57-86.

# Appendix 9

**Biodiversity Assessment Kyalite Stables Planning Proposal**
**(NGHenvironmental, August 2016)**

# Biodiversity Assessment

## KYALITE STABLES PLANNING PROPOSAL

AUGUST 2016

ngh environmental

## Document Verification

Project Title: Kyalite Stables Planning Proposal

| | |
|---|---|
| Project Number: | 16-130 |
| Project File Name: | Kyalite stables BA Draft |

| Revision | Date | Prepared by (name) | Reviewed by (name) | Approved by (name) |
|---|---|---|---|---|
| Draft | 26/08/16 | Bryson Lashbrook<br>Nicole Isles | Michial Sutherland | Erwin Budde |
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# EXECUTIVE SUMMARY

This Flora and Fauna Assessment indicates that impacts to biodiversity would be minor as a result of the proposed rezoning. The primary impact is from the proposed removal of ground cover vegetation. Residual impacts can be further reduced or mitigated by implementing a number of mitigation measures.

The proposed work is required to rezone three lots including Lot 2/DP562598, Lot 3/DP562598 and Lot 1/DP1121183. The lots are currently zoned as a mixture of SP2 Infrastructure (Road), RU1 Primary Production and R5 Large Lot Residential under the Deniliquin Local Environmental Plan (LEP). The proposed rezoning would change the zoning across all the lots to R5 Large Lot Residential.

The study area is within a modified landscape that has previously been dominated by agriculture. The study area is located on the flood plain of the Edward River. Much of the nearby lower-lying land is used for cropping and/or extensive livestock grazing, and where native vegetation remains in such areas, it is often restricted to scattered trees, and watercourses. Extensive clearing has resulted in heavily reduced ecological connectivity between remnant vegetation communities and adjacent lands. No threatened vegetation communities listed under the TSC Act or EPBC Act are present within the proposal site.

Fauna habitat values at the site include hollow-bearing trees and fallen timber. Any impact to fauna at the site would be minor as the proposal site is located in previously disturbed environment with poor structural diversity. Whilst the proposal area provides some suitable foraging and nesting habitat for fauna, similar vegetation exists in the study area and adjacent lands.

Vegetation removal would be kept to a minimum amount within the proposal site and proposed work would be undertaken from previously disturbed areas, therefore reducing the potential for impacts to retained adjacent habitat. Overall the loss of fauna habitats is not likely to lead to a substantial decline in availability of resources such that fauna populations would be affected.

Assessments of the significance to assess impacts on state and federally listed threatened biota were conducted. The assessments found a significant impact was not likely on any threatened biota. A Species Impact Statement or Referral to the federal Environment Minister is not required.

# CONTENTS

## TABLES



## FIGURES

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| Cwth | Commonwealth |
| DECCW | Refer to OEH |
| EEC | Endangered ecological community – as defined under relevant law applying to the proposal |
| EIA | Environmental impact assessment |
| EPBC Act | *Environmental Protection and Biodiversity Conservation Act 1999* (Cwth) |
| EP&A Act | *Environmental Planning and Assessment Act 1979* (NSW) |
| ERC | Edward River Council |
| ESD | Ecologically Sustainable Development |
| FM Act | *Fisheries Management Act 1994* (NSW) |
| ha | hectares |
| ISEPP | *State Environmental Planning Policy (Infrastructure) 2007* (NSW) |
| KFH | Key Fish Habitat |
| km | kilometres |
| LEP | Local Environment Plan |
| m | Metres |
| NES | Matters of National environmental significance under the EPBC Act (*c.f.*) |
| Noxious Weeds Act | *Noxious Weeds Act 1993* (NSW) |
| NPW Act | *National Parks And Wildlife Act 1974* (NSW) |
| NSW | New South Wales |
| NV Act | *Native Vegetation Act 2003* (NSW) |
| OEH | (NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water |
| REP | Regional Environmental Plan |
| SEPP | State Environmental Planning Policy (NSW) |
| SEWPAC | (Cwth) Department of Sustainability, Environment, Water, Population and Communities |
| SIS | Species Impact Statement |
| sp/spp | Species/multiple species |
| TSC Act | *Threatened Species Conservation Act 1995* (NSW) |

# 1 INTRODUCTION

Edward River Council (ERC) are proposing to rezone land on the eastern edge of Deniliquin adjacent the Edward River. Consultation was required as a part of the Gateway Determination process for rezoning. The NSW Office of Environment and Heritage (OEH) requested additional information as part of the consultation.

The site includes the proposed residential development of Lots 2 and 3 DP562598 and Lot 1 DP1121183, the total area of the proposal is 13.3 hectares and is located at 21701-21703 Riverina Highway, Deniliquin, NSW.

NGH Environmental have completed this Biodiversity Assessment (BA) on behalf of ERC.

## 1.1 PROJECT DESCRIPTION

The lots are currently zoned as a mixture of SP2 Infrastructure (Road), RU1 Primary Production and R5 Large Lot Residential under the Deniliquin Local Environmental Plan (LEP). The proposed rezoning would change the zoning across all the lots to R5 Large Lot Residential.

If the rezoning is successful, an application would be made to Council to subdivide the land. The proposed subdivision would create seven new lots. The lots would range in size from 1.2 ha to 2.638ha. Of the seven lots five would have frontage to the Edward River. The lots fronting the river would have a prescribed building envelope to limit disturbance to native vegetation. Of the lots fronting the river four have a designated access road from the proposed road to the building envelope.

The key impacts associated with the proposal would include:

- Vegetation disturbance for fencing and utilities.
- Vegetation disturbance for internal roads.
- Vegetation disturbance for building works with in the nominated building envelops.

## 1.2 STUDY AREA

### *1.2.1 Definitions*

The following terms used in this report are:

- **Proposal site** - the footprint of the proposed rezoning.
- **Proposal area** - land within 50m of the proposal area.
- **Study area** - land within 10km of the proposal area.

### *1.2.2 Location of the activity*

The proposal site is located about 2.15 kilometres south west of the Davidson Street-Hay Road intersection in Deniliquin NSW. The proposal site is found within the ERC Local Government Area (LGA). The extent of the study area is shown in Figure 1-1.

## 1.3 REPORT STRUCTURE

This Biodiversity Assessment:

- Outlines the relevant biodiversity legislative requirements pertaining to the proposal.
- Describes the survey methodologies and results.
- Outlines the potential impacts to flora and fauna associated with the proposal.
- Details suitable amelioration measures to mitigate these impacts.

## 1.4 SCOPE OF THE ASSESSMENT

The scope of the assessment includes:

- Desktop assessment of local ecological characteristics.
- Flora survey.
- Hollow bearing tree survey.
- General habitat assessment for flora and fauna species.
- Targeted bird surveys.
- Opportunistic surveys.
- Assessment of likely impacts.

## 1.5 AIM OF THIS ASSESSMENT

This Biodiversity Assessment is required to fulfil ERC's consultation obligations under S56 of the EP&A Act 1979.

Specifically, the aims of this report are to:

- Describe the biodiversity values of the site and surrounding area including identifying protected and threatened flora and fauna species, populations and ecological communities and their habitats.
- Identify the direct and indirect impacts of the possible options on flora and fauna species, populations, ecological communities and critical habitat.
- Address the requirements of relevant legislation including the *Environmental Planning & Assessment Act 1979* (EP&A Act), the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Assess the significance of the impact of the proposal on species, ecological communities and populations listed within the TSC Act and EPBC Act.
- Propose environmental management measures to avoid, minimise, mitigate and, if necessary, offset any impacts.

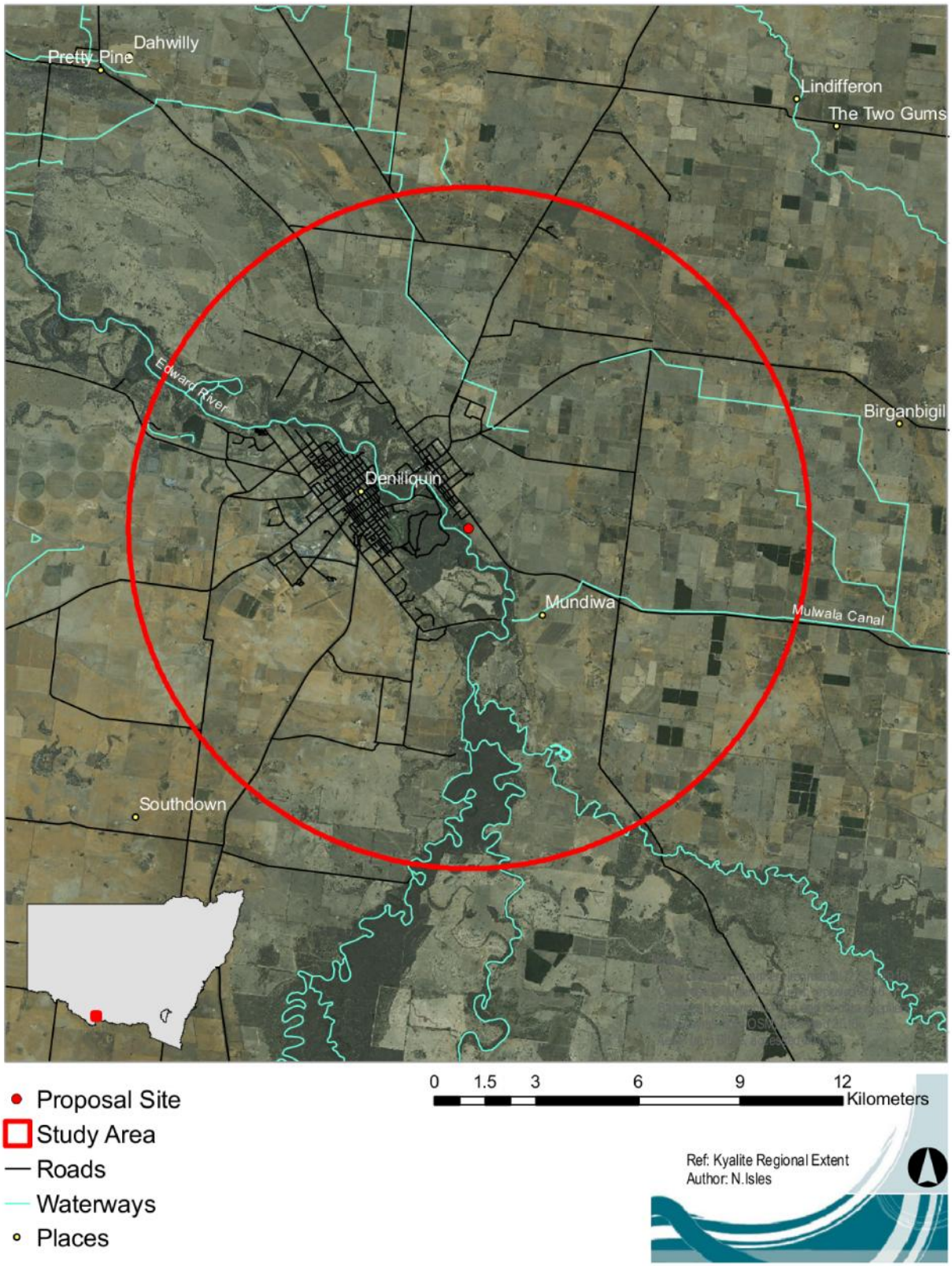


Figure 1-1 Proposal Location

# 2 STATUTORY CONSIDERATIONS

## 2.1 NSW THREATENED SPECIES CONSERVATION ACT 1995

The TSC Act sets out to:

- Conserve biological diversity and promote ecologically sustainable development.
- Prevent the extinction and promote the recovery of threatened species, populations and ecological communities.
- Protect the critical habitat of those species, populations and ecological communities that are endangered.
- Eliminate or manage certain threatening processes.
- Ensure proper assessment of activities impacting threatened species, populations and ecological communities.
- Encourage the conservation of threatened species, populations and ecological communities through co-operative management.

An Assessment of Significance (also known as the Seven-part Test), is a set of factors which must be considered by decision makers regarding the effect of a proposed development or activity on threatened species, populations or ecological communities, or their habitats. These factors form part of the threatened species assessment process under section 5A of the *EP&A Act*.

An assessment of the potential impacts of the proposed work on threatened species, populations, ecological communities and critical habitat has been completed in Appendix C.

## 2.2 NATIVE VEGETATION ACT (NV) 2003

The objects of this Act are:

a) to provide for, encourage and promote the management of native vegetation on a regional basis in the social, economic and environmental interests of the State, and
b) to prevent broadscale clearing unless it improves or maintains environmental outcomes, and
c) (c) to protect native vegetation of high conservation value having regard to its contribution to such matters as water quality, biodiversity, or the prevention of salinity or land degradation, and
d) to improve the condition of existing native vegetation, particularly where it has high conservation value, and
e) to encourage the revegetation of land, and the rehabilitation of land, with appropriate native vegetation,

in accordance with the principles of ecologically sustainable development.

Although no vegetation clearing is being proposed as part of the rezoning application, minor vegetation removal would occur as part of the development. The Act does not apply to lots zoned SP2, however does apply to lots zoned RU5 and R5. Consent from the Office of Environment and Heritage (OEH) may be required for the clearing of vegetation from these lands.

## 2.3 NOXIOUS WEEDS (NW) ACT 1993

This act aims to prevent the establishment, reduce the risk of spread and minimise the extent of noxious weeds. The NW Act guides the management of declared noxious weeds within Local Government Areas (LGAs). Two noxious weed species declared for the Deniliquin control areas was observed on site including African Boxthorn (*Lycium ferocissimum*) and Horehound (*Marubium vulgare*). Mitigation measures to ensure that declared noxious weeds are controlled and not spread into unaffected areas as a result of the works are listed in Section 6.

## 2.4 NSW NATIONAL PARKS AND WILDLIFE (NPW) ACT 1974

This Act aims to conserve nature, habitat, ecosystems, ecosystem processes and biological diversity at the community, species and genetic levels. Under this act all native fauna is protected, threatened or otherwise. Schedule 13 of the act lists protected plants which shall not be harmed or picked on any land either on or off National Park estate.

With regard to threatened species a person must not:

(a) harm any animal that is of, or is part of, a threatened species, an endangered population or an endangered ecological community, or

(b) use any substance, animal, firearm, explosive, net, trap, hunting device or instrument or means whatever for the purpose of harming any such animal.

Mitigation measures have been developed within this assessment to address risks to threatened species, endangered populations and endangered ecological communities.

### Ecologically Sustainable Development Principles

*The precautionary principle* –This assessment has been prepared utilising the precautionary principle. That is, if threats are perceived as possibly leading to serious or irreversible environmental damage, then either the non-development of the proposal would occur, or the development modified to ensure that such threats do not exist.

*Inter-generational equity* – The proposed works would not impact on natural or cultural features to a level that would compromise the health, diversity or productivity of the environment to a level that would impact on future generations.

*Conservation of biological diversity and ecological integrity* – The proposed works would require vegetation removal. The assessment has identified that the works would not impact notably on the biological diversity and ecological integrity of the region. Further, safeguards have been developed that would assist in protecting important habitat features at the site.

*Improved valuation of pricing of environmental resources* – The assessment has been undertaken in recognition of the economic worth of the environment.

Mitigation measures have been developed that would assist in protecting important habitat features at the site.

## 2.5 NSW FISHERIES MANAGEMENT (FM) ACT 1994

This Act sets out to conserve fish stocks and key fish habitats, threatened species, populations and ecological communities of fish and marine vegetation and biological diversity. Further, it aims to promote viable commercial fishing, aquaculture industries and recreational fishing opportunities.

Part 7 of the FM Act provides for the protection of aquatic habitats. A Part 7 Fisheries Management Act permit is required for:

- Activities involving dredging and reclamation work
- Activities temporarily or permanently obstructing fish passage
- Using explosives and other dangerous substances (where it may impact on aquatic habitat)
- Harming marine vegetation

The Edward River west of the proposal site is identified as key fish habitat (KFH) on the Department of Primary Industry's KFH maps. The proposed works would not involve any of the activities identified above and a Part 7 permit is not considered to be required.

Potential impacts to threatened fish species listed under the Act have been considered in Appendix C. No impact is considered likely.

## 2.6 ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION (EPBC) ACT 1999 (CWTH)

The EPBC Act introduces an assessment and approvals system for actions that have a significant impact on matters of national environmental significance (NES). Approval of the Environment Minister is required if an action is likely to have a significant impact on NES matters including:

- World Heritage Properties and places of National heritage.
- Wetlands of International Importance.
- Commonwealth Listed Threatened Species and Ecological Communities.
- Commonwealth Listed Migratory Species.
- Nuclear action.
- Commonwealth Marine areas.
- Commonwealth land.

# 3 METHODOLOGY

## 3.1 BACKGROUND REVIEW

Database searches were undertaken for records of Commonwealth and State listed threatened species, populations and ecological communities. Searches were conducted in August 2016 and included the following:

- NSW Office of Environment and Heritage (OEH) Wildlife Atlas data records within a 10 kilometre radius of the proposal site.
- EPBC Act Protected Matters search tool items with potential to occur within a 10 kilometre radius of the proposal site.

The results of the database searches are provided in Appendix C.

Literature relevant to this assessment was also reviewed and included:

- Office of Environment and Heritage (OEH) Threatened Species Profiles.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) EPBC Act Species Profiles and Threats Database (SPRAT).
- Construction methodology and concept designs.
- Aerial maps.

## 3.2 FIELD SURVEY

### *3.2.1 Timing and Location*

Field investigations were undertaken on 22 July 2016 by NGH Environmental ecologist, Bryson Lashbrook and field assistant, Nicole Isles. The field investigations aimed to identify the ecological characteristics of the study area and describe flora and fauna species present at the proposal site. Weather conditions at the site included heavy rain bands, wind gusts of up to 60 km/h and an average temperature of 13 degrees Celsius. The proposal site was traversed to survey flora, fauna and fauna habitat.

#### Survey Limitations

The survey was undertaken in weather conditions that are considered unfavourable for detecting fauna species. Heavy rain and wind greatly reduces detection rates of bird and other fauna species. The precautionary approach has been used in this report by assuming that threatened species may utilise the proposal area from time to time.

### *3.2.2 Flora survey*

A flora list for the vegetation community recorded was compiled using the approach known as the "random meander" documented by Cropper (1993). This method is suitable for covering large areas and for locating any rare species (and their associated vegetation communities/habitat types) that may occur within a study area. The method involves walking randomly across parts of the study area while sampling all of the various habitat types and vegetation communities present until no new species have been recorded for at least thirty minutes.

Detailed notes were taken of Hollow-bearing trees (HBT's) within the proposal area, however no HBT's would be removed as part of the proposed rezoning (refer to Appendix A). A full list of the flora species recorded at the site is presented in Appendix A. Field guides and standard texts used during the survey and for later identification purposes are provided in the reference list. The naming of species recorded or known for the region follows the Flora of NSW (Harden 1992-2002) with recent updates provided on PlantNET.

An assessment was undertaken of the flora characteristics of the proposal site including an assessment of the structure of the vegetation on site and the condition of vegetation including past disturbances. The presence of any noxious weeds located within the proposal site was also recorded (refer to Appendix A).

Vegetation communities in the proposal area have been categorised on the basis of structure and formation using the Benson (Benson, 2006) vegetation classification.

### *3.2.3 Fauna and Habitat Assessment*

Opportunistic fauna surveys and a habitat assessment were conducted within the proposal site.

The fauna survey included:

- An assessment of habitat types and quality in the proposal site.
- Incidental sightings of fauna.
- Indications of fauna presence including scats, scratch marks, tracks, etc.
- An assessment of the value of the proposal site as a wildlife corridor.
- An assessment of the extent and type of fauna habitats in the proposal site with particular reference to threatened species, and the conservation significance of any such habitat.
- Recording of the locations of all hollow-bearing trees within the proposal site.

Field guides and standard texts used as a reference are provided in the reference list. The naming of species recorded or known for the region follows the nomenclature present in these texts. The conservation significance of plants, animals and vegetation communities recorded is made with reference to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Threatened Species Conservation Act 1995* (TSC Act).

# 4 RESULTS

## 4.1 LANDSCAPE CONTEXT

The study area is located within the Riverina Bioregion IBRA bioregion (Figure 4-1). The Riverina Bioregion is dominated by river channels and floodplains and covers the alluvial fans of the Lachlan, Murrumbidgee and Murray Rivers west of the Great Dividing Range and extends down the Murray.

The region comprises three overlapping alluvial fans that are all of Quaternary age. The alluvial fan within the study area is confined and has active anabranch channels where water flow is forced around the obstacle of the Cadell fault near Echuca. At times of extreme flood flow, water from the different streams can cross the fan surfaces and enter channels of other systems.

Modern river channels consist mostly of sandy soils and more saline heavy grey and brown clays and support river red gum (*Eucalyptus camaldulensis*) and river cooba (*Acacia stenophylla*) communities. Here on the sandy soils, the river red gum understorey is generally composed of herbaceous perennial, annual and post-flooding ephemeral species that alter with topography and flooding characteristics.

The Riverina Bioregion is dominated by persistently dry semi-arid climate, and characterised by hot summers and cool winters. The highest levels of rainfall in the bioregion occur in May and September. Summary rainfall tends to occur mainly from localised thunderstorms, with more consistent rainfall occurring in the winter months. The mean annual temperature is 15-18 degrees Celsius and the mean annual rainfall is 238-617mm.

Land uses within the study area are mostly agricultural with a number of rural properties located along the Riverina Highway. The Murray Valley National Park is located about 5 kilometres south of the proposal area.

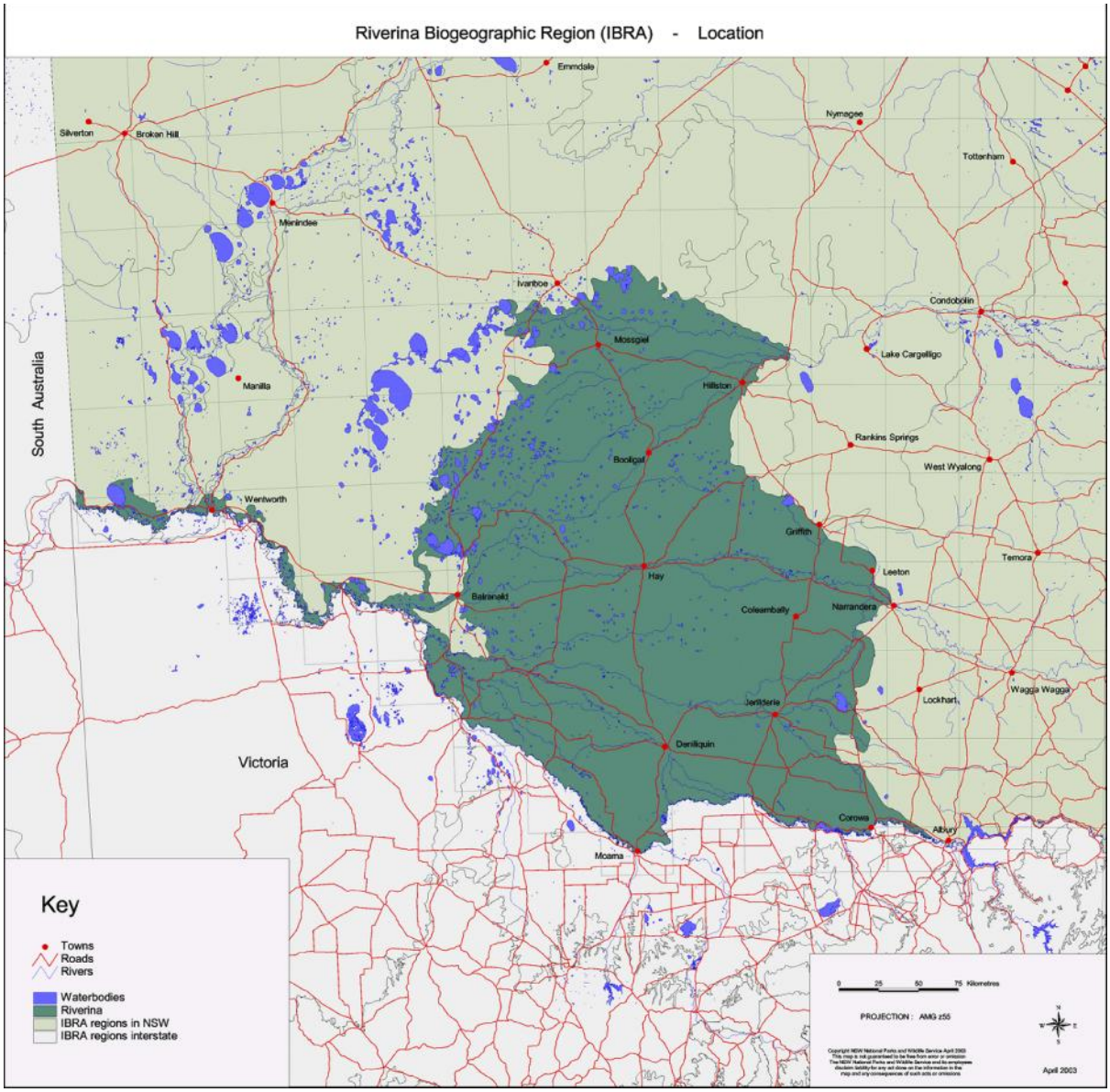


Figure 4-1 South Western Slopes Bioregion.

### *4.1.1 Vegetation Mapping*

Recent vegetation classification for the NSW Riverina Bioregion undertaken by Benson (2006) describes a total of 213 plant communities for the bioregion. Up to 60 per cent of the native vegetation in the bioregion has been cleared, with the existing vegetation predominately comprising *Eucalyptus*-dominated grassy or shrubby woodlands and open forests.

Vegetation mapping for the study area has been completed by DECCW (2010) as part of the NSW Vegetation Information Systems (VIS). This mapping is derived from high resolution aerial imagery and is considered accurate to 87 per cent. The VIS map sheet 1672, identifies six different plant communities that occur within the study area. The vegetation structure of the proposal area is further discussed in section 4.2.2

### 4.1.2 Species of Conservation Significance

Background searches for threatened flora and fauna species revealed a range of species which have previously been recorded in the study area or which may occur if suitable habitat is present (Appendix D). A list of these species as well as their state and national conservation significance, habitat requirements, location of nearest records, potential to occur in the study area and the likelihood of impact is provided in Appendix C.

NSW OEH Wildlife Atlas searches for threatened species listed on the TSC Act revealed one flora and 46 fauna species which have been previously recorded within a 10 km radius of the proposal site (Appendix D). The EPBC Act protected matters search tool revealed a total of three threatened flora species, 12 threatened fauna species and 12 migratory species with the potential to occur within a 10 kilometre radius of the proposal site (Appendix D).

NSW OEH Wildlife Atlas database searches for Endangered Ecological Communities (EEC) revealed one EEC with the potential to occur in the study area:

- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions.

In addition, one aquatic EEC is listed as occurring within the study area:

- The aquatic ecological community in the natural drainage system of the lower Murray River catchment

The EPBC protected matters search tool revealed five EECs which have the potential to occur within the study area.

- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions.
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia.
- Natural Grasslands of the Murray Valley Plains.
- Weeping Myall Woodlands.
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

### 4.1.3 EPBC matters of National Significance

The EPBC Act identifies four matters of national environmental significance. These include Ramsar wetlands of international significance, nationally listed threatened species and ecological communities and listed migratory species.

A search of the EPBC databases for items of national environmental significance was conducted to identify significant features within a 10 kilometre radius of the proposal site (Appendix D) A summary of the results is included in Table 4-1.

Table 4-1 Summary of EPBC results

| Matters of national significance | Results | Comment |
|---|---|---|

| Matters of national significance | Results | Comment |
|---|---|---|
| World Heritage Properties | None | Not applicable. |
| National Heritage Places | None | Not applicable. |
| Wetlands of International Importance | 5 | Are not located in the study area and would not be impacted by the proposed works. |
| Great Barrier Reef Marine Park | None | Not applicable. |
| Commonwealth Marine Areas | None | Not applicable. |
| Threatened Ecological Communities | 5 | Threatened Ecological Communities have been assessed for potential impact in Section 5 and Appendix C. Impacts are not considered likely to be significant. |
| Threatened Species | 19 | Threatened species have been assessed for potential impact in Section 5 and Appendix CD. Impacts are not considered likely to be significant. |
| Migratory Species | 7 | Migratory species have been assessed for potential impact in Section 5 and Appendix CD. Impacts are not considered likely to be significant. |

## 4.2 FLORA

The following provides a summary of the survey results and vegetation characteristics of the proposal site. The full list and general abundance of species recorded during the flora survey is presented in Appendix A.

The level of disturbance to vegetation was found to vary across the proposal site. It includes cleared (dominated by pasture grasses, escaped crops, and pasture weeds) and heavily degraded land (some native flora e.g. trees, over a mostly non-native ground layer). The various levels of disturbance are due to previous clearing activities to facilitate agriculture (Grazing). Vegetated areas were found to be dominated by mature / semi mature stands of River Red Gums (*Eucalyptus camaldulensis*) and Black Box (*Eucalyptus largiflorens*) with poor structural diversity of native mid and understorey species. However, the majority of the wider landscape is highly disturbed and predominantly agricultural, and thus the diversity of non-native flora is high, and the cover of such species sometimes dense and extensive. Two declared noxious weed species (African Boxthorn and Horehound) are present in the proposal site.

### *4.2.1 Diversity of flora species recorded*

A total of seven native and 13 non-native flora species were identified during the field survey. Two noxious weeds declared for the Deniliquin Shire Council control area were recorded, African Boxthorn (*Lycium ferocissimum*) and Horehound (*Marubium vulgare)*, both of which are categorised as Class 4 ("The growth of the plant must be managed in a manner that reduces its numbers, spread and incidence, and continuously inhibits its reproduction").

River Red Gum and Black Box dominate the over storey vegetation with individual species such as River Cooba (*Acacia stenophylla*) and Kurrajong (*Brachychiton populneus*) occurring as isolated trees. Planted Peppercorn Trees (*Schinus areira*) were also present along fence lines.

Mid-storey species were uncommon throughout. Old Man Saltbush (*Atriplex nummularia*) occurred within an old house block with other mid-storey species, African Boxthorn (*Lycium ferocissimum),* being less common. The ground stratum was a mix of both native and non-native herbaceous forbs and grasses. Common natives include Wild Turnip (*Brassica tournefortii*), Ruby Saltbush (*Enchylaena tomentose*) and Native Carrot (*Daucus glochidiatus*). Common weeds found in the ground stratum include Barley Grass (*Hordeum leporinum*), Common Mallow (*Malva neglecta*), Stinging Nettle (*Urtica dioica),* Patterson's Curse (*Echium plantagineum*) with Curled Dock (*Rumex crispus*), Horehound (*Marrubium vulgare)*, Capeweed (*Arctotheca calendula*), Spear Thistle (*Cirsium vulgaris*) and Black Rolypoly (*Sclerolaena muricata*) being less common.

### *4.2.2 Vegetation communities*

The proposal site is located within a modified landscape that has previously been dominated by agriculture. Large remnants of native vegetation occur near the proposal site, and these include Murray Valley National Park. However, much of the nearby lower-lying land is used for cropping and/or livestock grazing, and where native vegetation remains in such areas, it is often restricted to scattered trees, and watercourses. Extensive clearing has resulted in heavily reduced ecological connectivity between remnant vegetation communities and adjacent lands. However, some parts of the study area retain fair to good connectivity with other remnant habitats, especially along the Edward River corridor.

The NSW OEH Vegetation Information System maps vegetation six plant communities within the study area (refer to Figure 4-2). Fieldwork and the Benson (2006) plant community classification system indicated that two vegetation communities occur within the proposal area (refer to Figure 4-3) These two vegetation communities are:

- River Red Gum – Warrego Grass – herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion (Vegetation ID 7).
- River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina and Murray Darling Depression Bioregions) (Vegetation ID 10).

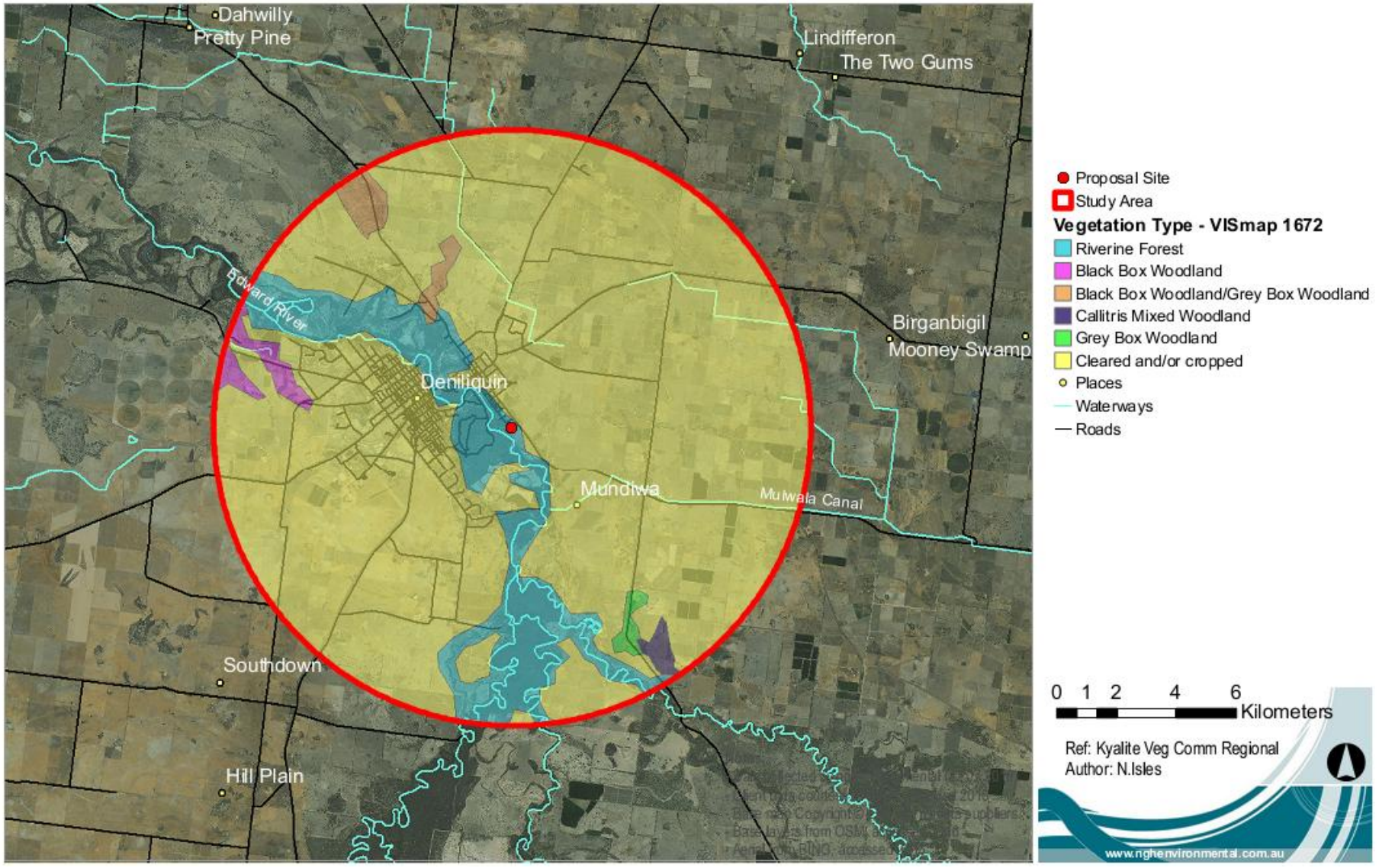


Figure 4-2 The NSW OEH Vegetation Information System maps vegetation six plant communities within the study area

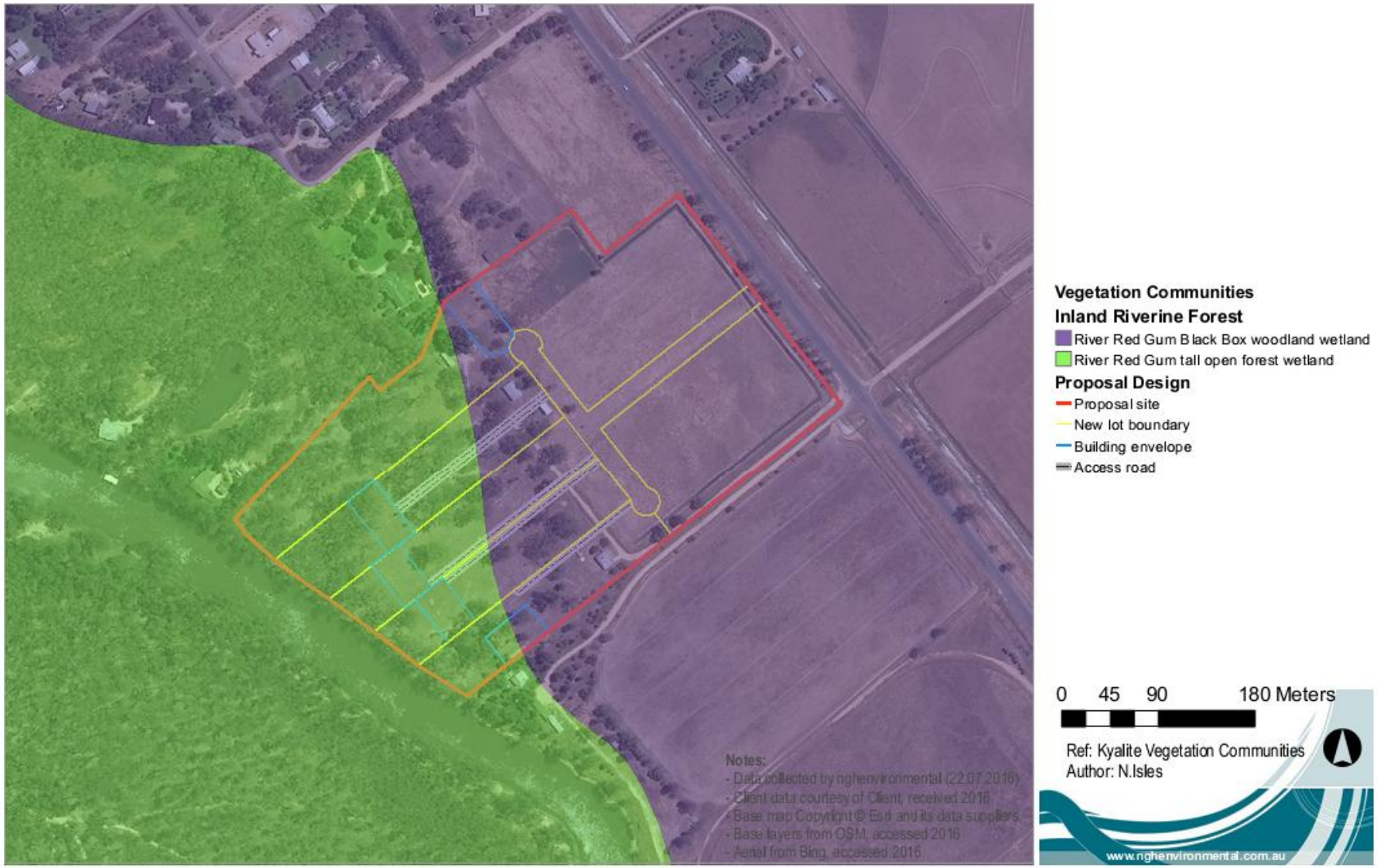


Figure 4-3 Vegetation community classification for the proposal area

A detailed vegetation community description is given in Table 4-2.

Table 4-2 Vegetation community table

| **River Red Gum – Warrego Grass – herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion** | |
|---|---|
| ***Occurrence*** | Vegetation occurs on alluvial brown or grey cracking clay soils or clay loams on the inner floodplains and lining channels including on levees of major river systems. Distributed from the lower slopes along the lower Lachlan and Murrumbidgee Rivers including in the Great Cumbung Swamp and the mid-west to western section of the Murray River in NSW (generally west Deniliquin) mainly in the Riverina Bioregion. This is the dominant River Red Gum forest between Deniliquin and Swan Hill. |
| ***Structure*** | Open Forest |
| ***Conservation Status*** | Estimated 30% cleared. Not threatened. |
| ***Common Species*** | Nominal:<br>Canopy: River Red Gum (*Eucalyptus camaldulensis subsp. camaldulensis*)<br>Mid-storey: River Cooba (*Acacia stenophylla),* Box Mistletoe *(Amyema miquelii)*<br>Understorey: *Paspalidium jubiflorum; Wahlenbergia fluminalis; Senecio quadridentatus; Carex tereticaulis; Ranunculus; nundatus; Carex appressa; Elymus scaber var. plurinervis; Lachnagrostis filiformis; Austrodanthonia duttoniana; Austrodanthonia caespitosa; Cynodon dactylon; Eleocharis acuta; Eleocharis pusilla; Carex inversa; Juncus amabilis; Juncus flavidus; Marsilea drummondii; Brachyscome basaltica var. gracilis; Pratia concolor; Picris squarrosa; Centipeda cunninghamii; Alopecurus geniculatus; Calostemma purpureum; Calotis scapigera; Ranunculuspumilio var. pumilio; Asperula conferta; Parietaria debilis; Craspedia variabilis; Haloragis heterophylla; Dichondra repens; Rumex brownii; Alternanthera denticulata; Eclipta platyglossa; Oxalis perennans; Einadia nutans subsp. nutans; Verbena gaudichaudii; Enteropogon acicularis; Senecio cunninghamii var. cunninghamii.* |
| ***Equivalent vegetation types*** | Reference community 7 in Benson et al. (2006) |

| | |
|---|---|
| **Site Example** |  <br>Figure 4-4 River Red Gum community |
| **River Red Gum – Black Box woodland wetland of the semi-arid (warm) climatic zone (mainly Riverina and Murray Darling Depression Bioregions)** | |
| ***Occurrence*** | This community occurs on grey to brown loam to medium clays in drainage depressions, swamps and backplains on alluvial plains and flood plains of rivers. Occurs west of the western edge of the southern wheatbelt in NSW to the western section of the Riverine Plain Bioregion and the Murray-Darling Depression Bioregion in south-western NSW extending into Victoria and perhaps South Australia. |
| ***Structure*** | Woodland |
| ***Conservation Status*** | Estimated 60% cleared. Not threatened. |
| ***Common Species*** | Nominal:<br>Canopy: River Red Gum (*Eucalyptus camaldulensis subsp. camaldulensis*) and Black Box (*Eucalyptus largiflorens*)<br>Midstorey: *Muehlenbeckia florulenta; Chenopodium nitrariaceum; Acacia salicina; Acacia stenophylla; Exocarpos strictus; Rhagodia spinescens; Sclerolaena muricatasens lat.*<br>Understorey: *Paspalidium jubiflorum; Einadia nutans subsp. nutans; Cynodon dactylon; Austrodanthonia caespitosa; Wahlenbergia fluminalis; Cyperus exaltatus; Enteropogon acicularis; Chloris truncata; Eclipta platyglossa; Lachnagrostis filiformis; Vittadinia dissecta; Brachyscome basaltica var. gracilis; Sclerolaena brachyptera; Boerhavia dominii; Oxalis perennans; Chamaesyce drummondii; Atriplex spinibractea; Sida corrugata; Sida trichopoda; Austrostipa scabra subsp. scabra; Austrostipa nodosa; Carex inversa.* |
| ***Equivalent vegetation types*** | Reference community 10 in Benson (2006) |

| | |
|---|---|
| **Site Example** |  <br>Figure 4-5 |

### 4.2.3 Threatened flora

No threatened flora species were identified during the field survey. Habitat requirements and an assessment of the likelihood of presence for all threatened flora species are provided in Appendix C. Ecological information about each species is derived from the NSW OEH Threatened Species profile webpages and the Conservation Advice statements provided by Commonwealth Department of the Environment.

Habitat assessments for all threatened plant species determined that no threatened flora species are likely to be impacted by the proposal (refer to Appendix C).

### 4.2.4 Vegetation communities of conservation significance

No endangered ecological communities were found to occur on the proposal site. However, the proposal site is immediately adjacent to the Lower Murray River EEC, and indirect impacts on this ecosystem could occur as a result of the proposal.

## 4.3 FAUNA

### 4.3.1 Habitat types and value

The following provides a summary of the fauna habitat characteristics of the proposal site. A full list and general abundance of fauna species recorded during the survey is presented in Appendix B.

The proposal site supports Open Woodland habitat comprising of River Red Gum, Black Box and River Cooba . Terrestrial fauna habitats within the proposal site include:

- Fallen timber and dead wood that could provide habitat for ground dwelling fauna.
- Mature eucalypts with hollows, cracks and fissures present that could provide foraging, roosting and nesting habitat for birds, micro-chiropteran bat species and arboreal mammals.

- Temporary areas of inundation that would provide foraging habitat for bird species and amphibian habitat.

A total of 24 hollow bearing trees (HBT) were found across the proposal site (Figure 4-6). Details of the HBT surveyed within the proposal site is presented in Appendix A.

### *4.3.2 Diversity of Fauna Species Recorded*

Opportunistic observations made during the survey, observed a total of nine species of birds in the proposal area (Appendix B). Bird activity during the survey was considered low due to unfavourable weather. No evidence of mammals was found within the proposal site, however suitable habitat exists throughout.

### *4.3.3 Threatened Fauna*

Database searches identified 16 threatened fauna species that have been previously recorded within a 10 km radius of the study area. Availability of suitable habitat for these species within the proposal area was assessed during the site inspection. Habitat requirements and likelihood of presence for all threatened fauna species can be found in Appendix C. No threatened fauna species listed under the EPBC Act or TSC Act were observed in the study area.

Habitat assessments for all threatened animal species determined that a number of threatened bird and mammal species could occur in the proposal area and be impacted by the proposal (refer to Appendix C).


Figure 4-6 Location of hollow bearing trees within the proposed site

# 5 ASSESSMENT OF IMPACTS

## 5.1 GENERAL

The proposal would result in a number of direct and indirect impacts on flora and fauna including:

- Removal of ground cover vegetation.
- The removal of potential habitat for fauna.
- Removal of 2 hollow-bearing trees.
- Ongoing impacts to fauna habitat from the change of land use to a more intense residential use.
- Minor impact on the corridor values of the proposal area.
- Potential for weeds to be imported and/or distributed.

The proposal would require removal of ground cover vegetation, limited to the building envelope, access tracks and roads and fence line corridors, as presented in Figure 4-6. Direct and indirect impacts would occur to understorey species through removal of ground cover vegetation. All flora species recorded within the proposal area are considered common in the locality and are present in adjacent areas outside of the proposal area. None of the flora species which would be removed are listed as threatened species.

Potential impacts to fauna would be from disturbance and removal of some nesting and foraging habitat. Given that no tree removal is required, the proposal would be unlikely to substantially reduce the availability of foraging habitat within the study area as suitable foraging resources are found in trees beyond the proposal area and in adjacent lands.

The assessment identified a total of 24 hollow bearing trees within the proposal site (Figure 4-6), with two hollow bearing trees potentially impacted. The removal of two hollow-bearing trees from the landscape is not considered to have any detrimental impact on the availability of this resource in the proposal area.

The change in land use, from a predominantly rural landuse to a more intense residential one, would have ongoing impacts to the suitability of the proposal site for use by fauna. Specifically, disturbance intolerant species would be less likely to utilise the remaining habitats on the proposal site. Conversely, disturbance tolerant species would likely increase their use of the habitats left behind by other species. In the context of the broader landscape, this impact is considered small. The surrounding area is already used for human-intense purposes, including for residential and infrastructure purposes. Whilst there may be a slight reduction in fauna biodiversity, the overall impact on the landscape is considered negligible.

The proposal would contribute towards further fragmentation of vegetation in the locality. This can have an effect on the movement of fauna and flora species across the landscape. However, fauna species likely to utilise the habitat in the proposal area for movement would be highly mobile and disturbance tolerant, as the site is located in a modified environment. This minor reduction in habitat would not affect the ability for these species to move around the locality.

There is an increased risk that the spread of weeds could occur the early stages of the works, when vegetation is being cleared and topsoil is being stripped for the construction of the property access. This could occur from the importation of weed seed and through the spread of weed seed by machinery between infested areas. Several noxious weeds occur frequently throughout the proposal area and could be spread as a result of the works.

## 5.2 THREATENED SPECIES

### 5.2.1 Flora

No threatened flora species were identified as occurring in the proposal site. Habitat assessments determined that no threatened flora species are likely to be impacted by the proposed works.

### 5.2.2 Endangered Ecological Communities

The proposal would not require the removal of any threatened vegetation communities listed under the TSC Act or EPBC Act.

Indirect impact to the Lower Murray River EEC couold occur as a result of the proposal, specieifically:

- Sedimentation of aquatic environments from erosion and runoff during construction work
- Ongoing indirect impacts such as pollution of waterways and increased human activity along the river bank and within the aquatic environment.

A 7 Part Test was undertaken (Appendix E) to assess the significance of these impacts. The 7-Part Test found that a significant impact on this EEC is not likely because:

1. The extent of any impact is extremely small in comparison to the extent of the EEC
2. The impact is unlikely to results in any fragmentation or isolation of this community.

A Species Impact Statement for this EEC is not required.

### 5.2.3 Fauna

No threatened fauna species listed under the EPBC Act or TSC Act were observed during the field surveys.

Habitat assessments for all threatened animal species determined that several threatened bird and mammal species could occur at the proposal site and be potentially impacted by the work (refer to Appendix C). Impacts would include:

- The removal of hollow-bearing trees, a potential breeding and roosting resource for bird and mammal species
- Clearing of understorey and overstorey vegetation
- Increased human activity resulting in increased disturbance to habitats and home ranges of species

A Seven Part Test (TSC Act) and Assessment of Significance (EPBC Act) was conducted (Appendix E) for these species (as relevant). The assessments concluded that a significant impact is not likely given:

1. The small extent of habitat affected when compared with the home range requirements of these species.
2. The proposal site provides very limited habitats and resources for these species
3. Fragmentation and isolation of habitat is likely to be marginal for these species, as they are all relatively mobile
4. The increase in human activity is only small and not likely to lead to any species or their habitats becoming extinct locally.

A Species Impact Statement or referral to the Commonwealth Environment Minister is not required for any of these species.

### *5.2.4 Key Threatening Processes (TSC Act and EPBC Act)*

The Key Threatening Processes triggered by the proposal include the following:

- Clearing of native vegetation – Works would involve the removal of native ground cover vegetation. The vegetation which would be removed is common and widespread. Potential habitat which would be removed is small in the context of the locality. Impacts to flora and fauna as a result of the works would be minor.
- Removal of dead wood– Dead wood would be relocated as a result of the proposal where required. Considering the small size of the clearing area and the presence of intact extents of native vegetation adjacent to the proposal site the relocation of this small amount of dead wood is unlikely to increase the impact of this key threatening process.

# 6 MITIGATION MEASURES

Vegetation removal would be restricted to only those areas identified as being necessary for the proposed property access.

NGH Environmental proposes the following safeguards to mitigate impacts to flora and fauna at the proposal site. Appropriate safeguards would assist in reducing impacts of the proposed activity and can be mitigated through appropriate construction and rehabilitation practices on site.

## 6.1 GENERAL MITIGATION MEASURES

- Staff are to be made aware prior to the commencement of construction works of their environmental responsibilities including vegetation clearing boundaries, working in proximity to native vegetation, potential presence of fauna and other environmental matters related to the project.
- All refuelling of vehicles and equipment would be undertaken off site.
- Appropriate erosion and sediment controls would be installed to retain soil stability, protect tree root zones, and prevent sediment from impacting ground cover vegetation.

## 6.2 PRE-CLEARING

- Prior to the commencement of works any trees to be removed are to be marked with a visual marker (spray paint / flagging tape etc).
- Ensure no vehicle or pedestrian can access beyond project boundary.
- If unexpected threatened fauna or flora species are discovered, stop works immediately and notify ERC. Further assessment may be required before work recommencing.

## 6.3 CLEARING OF VEGETATION

Trees are to be removed in stages so as not to cause damage to surrounding vegetation.

- Only vegetation identified in this BA is to be removed.
- If any HBT trees are required to be removed, further assessment would be required.
- Pruning of trees must be undertaken by a qualified arborist and where hollows are present, a suitably qualified ecologist must be present to inspect trees prior to pruning.
- Where possible to do so, the trees to be removed would be mulched and re-used in surrounding areas.

## 6.4 FAUNA MITIGATION MEASURES

- If unexpected threatened fauna or flora species are discovered, stop works immediately and contact the local veterinary and/or wildlife carer.

## 6.5 WEED MANAGEMENT

- Declared noxious weeds are to be removed, isolated, and disposed of at a licenced landfill. Where this is impractical, the weeds (and associated topsoil) should be buried at least 500mm below the final ground level and covered with clean fill and/or topsoil.
- The use of herbicides would be restricted to controlling exotic species in the proposal area and suitable application methods would be employed to ensure no impacts occur to surrounding areas of vegetation.
- Herbicides must be used in accordance with the manufacturer's guidelines.
- Herbicides must not be used when rain is forecast.

# 7 CONCLUSION

This Flora and Fauna Assessment indicates that impacts to biodiversity would be minor as a result of the proposed rezoning. The primary impact is from the proposed removal of ground cover vegetation. Residual impacts can be further reduced or mitigated by implementing the mitigation measures listed in Section 6.

The proposal is to rezone three lots including Lot 2/DP562598, Lot 3/DP562598 and Lot 1/DP1121183. The lots are currently zoned as a mixture of SP2 Infrastructure (Road), RU1 Primary Production and R5 Large Lot Residential under the Deniliquin Local Environmental Plan (LEP). The proposed rezoning would change the zoning across all the lots to R5 Large Lot Residential.

The study area is located within a modified landscape that has previously been dominated by agriculture. The study area located on the flood plains of the Edward River. Much of the nearby lower-lying land is used for cropping and/or extensive livestock grazing, and where native vegetation remains in such areas, it is often restricted to scattered trees, and watercourses. Extensive clearing has resulted in heavily reduced ecological connectivity between remnant vegetation communities and adjacent lands. No threatened vegetation communities listed under the TSC Act or EPBC Act are present within the proposal site.

Fauna habitat values at the site include hollow-bearing trees and fallen timber. Any impact to fauna at the site would be minor as the proposal area is located in previously disturbed road side environment with poor structural diversity. Whilst the proposal area provides some suitable foraging and nesting habitat for fauna, similar vegetation exists in the study area and adjacent lands.

Vegetation removal would be kept to a minimum amount within the proposal site and proposed work would be undertaken from previously disturbed areas, therefore reducing the potential for impacts to retained adjacent habitat. Overall the loss of fauna habitats is not likely to lead to a substantial decline in availability of resources such that fauna populations would be affected.

Assessments of the significance to assess impacts on state and federally listed threatened biota were conducted. The assessments found a significant impact was not likely on any threatened biota. A Species Impact Statement or Referral to the federal Environment Minister is not required.

The implementation of mitigation measures would minimise the risk of any ecological impacts.

# 8 REFERENCES

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# APPENDIX A FLORA SPECIES LIST

**Table A.1. Flora.** Species recorded during the site survey on the 22 July 2016

| Scientific name | Common name |
|---|---|
| Natives | |
| *Acacia stenophylla* | River Cooba |
| *Atriplex nummularia* | Old Man Saltbush |
| *Brachychiton populneus* | Kurrajong |
| *Daucus glochidiatus* | Native Carrot |
| *Eucalyptus camaldulensis* | River Red Gum |
| *E. largiflorens* | Black Box |
| Weed Species (Noxious Weeds in bold) | |
| *Arctotheca calendula* | Capeweed |
| *Brassica tournefortii* | Wild Turnip |
| *Cirsium vulgaris.* | Spear Thistle |
| *Daucus glochidiatus* | Native Carrot |
| *Echium plantagineum* | Paterson's curse |
| *Enchylaena tomentosa* | Ruby Saltbush |
| *Hordeum leporinum* | Barley Grass |
| ***Lycium ferocissimum*** | **African Boxthorn** |
| *Malva neglecta* | Common Mallow |
| ***Marrubium vulgare*** | **Horehound** |
| *Rumex crispus* | Curled Dock |
| *Schinus areira* | Peppercorn Tree |
| *Sclerolaena muricata* | Black Rolypoly |
| *Urtica dioica* | Stinging Nettle |

**Table A.2. Flora.** Hollow-bearing trees recorded during the site survey on the 22 July 2016

| Tree ID | Species Name | Common Name | Hollows | Approximate Height | Approximate DBH | Y Coordinate | X Coordinate |
|---|---|---|---|---|---|---|---|
| **HBT1** | Eucalyptus camaldulensis | River Red Gum | 10 | 30 | 1.50 | 6065195.13 | 318164.19 |
| **HBT2** | Eucalyptus largiflorens | Black Box | 2 | 20 | 1.50 | 6065192.10 | 318168.42 |
| **HBT3** | Eucalyptus largiflorens | Black Box | 5 | 10 | 1.50 | 6065175.44 | 318183.64 |
| **HBT4** | Eucalyptus largiflorens | Black Box | 2 | 30 | 1.50 | 6065191.36 | 318120.73 |
| **HBT5** | Eucalyptus largiflorens | Black Box | 5 | 30 | 1.00 | 6065210.34 | 318121.16 |
| **HBT6** | Eucalyptus camaldulensis | River Red Gum | 2 | 30 | 3.00 | 6065174.34 | 318086.24 |
| **HBT7** | Eucalyptus camaldulensis | River Red Gum | 2 | 30 | 1.50 | 6065156.84 | 318077.17 |
| **HBT8** | Eucalyptus camaldulensis | River Red Gum | 2 | 15 | 2.00 | 6065140.26 | 318075.05 |
| **HBT9** | Eucalyptus largiflorens | Black Box | 2 | 30 | 2.00 | 6065155.21 | 318111.58 |
| **HBT10** | Eucalyptus largiflorens | Black Box | 4 | 15 | 1.50 | 6065147.12 | 318128.43 |
| **HBT11** | Eucalyptus largiflorens | Black Box | 2 | 30 | 1.00 | 6065156.25 | 318129.79 |
| **HBT12** | Eucalyptus largiflorens | Black Box | 5 | 25 | 2.00 | 6065155.41 | 318137.51 |
| **HBT13** | Eucalyptus largiflorens | Black Box | 2 | 25 | 2.00 | 6065158.50 | 318191.42 |
| **HBT14** | Eucalyptus largiflorens | Black Box | 3 | 30 | 2.00 | 6065146.64 | 318191.75 |
| **HBT15** | Eucalyptus largiflorens | Black Box | 3 | 30 | 2.00 | 6065125.81 | 318177.30 |
| **HBT16** | Eucalyptus camaldulensis | River Red Gum | 1 | 30 | 2.00 | 6065099.95 | 318139.10 |
| **HBT17** | Eucalyptus largiflorens | Black Box | 3 | 30 | 2.00 | 6065051.51 | 318190.51 |
| **HBT18** | Eucalyptus largiflorens | Black Box | 3 | 30 | 2.00 | 6065104.39 | 318182.45 |
| **HBT19** | Eucalyptus largiflorens | Black Box | 3 | 30 | 2.00 | 6065108.43 | 318184.64 |
| **HBT20** | Eucalyptus largiflorens | Black Box | 3 | 30 | 2.00 | 6065106.51 | 318176.35 |
| **HBT21** | Eucalyptus largiflorens | Black Box | 2 | 30 | 1.50 | 6065115.06 | 318199.65 |
| **HBT22** | Eucalyptus largiflorens | Black Box | 3 | 30 | 1.50 | 6065117.78 | 318208.21 |
| **HBT23** | Eucalyptus largiflorens | Black Box | 5 | 30 | 2.50 | 6065120.53 | 318206.61 |
| **HBT24** | Eucalyptus largiflorens | Black Box | 3 | 25 | 2.00 | 6065058.28 | 318212.78 |


**Figure A.1. Flora.** Detailed map of hollow-bearing trees recorded during the site survey on the 22 July 2016

# APPENDIX B FAUNA SPECIES LIST

**Table B.1. Fauna.** Species recorded during the site survey on the 22 July 2016

Key

O - Denotes the species was observed

H - Denotes the species was heard.

| Scientific name | Common name | Observation |
|---|---|---|
| **AVES-BIRDS** | | |
| *Anas superciliosa* | Pacific Black Duck | O |
| *Cacatua roseicapilla* | Galah | O |
| *Cracticus tibicen* | Magpie | O |
| *Corcorax melanorphamphos* | White-Winged Chough | O |
| *Manorina melanocephala* | Noisy Miner | O |
| *Petrochelidon nigricans* | Tree Martin | O |
| *Platycercus elegans flaveolus* | Yellow Rosella | O |
| *Platycercus eximius* | Eastern Rosella | O |
| *Haliastur sphenurus* | Whistling Kite | O |

# APPENDIX C THREATENED SPECIES EVALUATIONS

The tables in this appendix present the habitat evaluation for threatened species, ecological communities and endangered populations recorded from within a 10 km radius around the Proposal site. Records are from a search of the OEH *Atlas of NSW Wildlife*, and the Commonwealth EPBC *Protected Matters Search Tool*[.] for the Department of Sustainability, Environment, Water, Populations and Communities.

The likelihood of occurrence is based on presence of habitat, proximity of nearest records and mobility of the species (where relevant). The assessment of potential impact is based on the nature of the proposal, the ecology of the species and its likelihood of occurrence. The following classifications are used:

**Presence of habitat:**

Present: Potential or known habitat is present within the study area

Absent: No potential or known habitat is present within the study area

**Likelihood of occurrence**

Unlikely: Species known or predicted within the locality but unlikely to occur in the study area

Possible: Species could occur in the study area

Present: Species was recorded during the field investigations

**Possible to be impacted**

No: The proposal would not impact this species or its habitats. No Assessment of Significance (AoS) is necessary for this species

Yes: The proposal could impact this species or its habitats. An AOS has been applied to these entities.

## C.1 EVALUATION OF THE LIKELIHOOD AND EXTENT OF IMPACT ON THREATENED FLORA SPECIES

| Species | Description of habitat1 | Presence of habitat | Likelihood of occurrence | Possible impact? |
|---|---|---|---|---|
| **Tree** | | | | |
| Boland Yellow Gum<br>*Eucalyptus leucoxylon subsp. pruinosa*<br>TSC-V | Boland Yellow Gum is a small to medium-sized tree growing to about 20 m high. *Eucalyptus leucoxylon subsp. pruinosa* is a tree species which, in New South Wales, occurs at the bases of sandy rises and on loamy clay flats on the floodplains of the Murray River and its tributaries in the Riverina Bioregion. | Present | Unlikely | No |
| **Grass** | | | | |
| A spear grass<br>*Austrostipa metatoris*<br>TSC-V<br>EPBC-V | *Austrostipa metatoris* is confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest. A Spear Grass grows in open woodlands on grey, silty clay or sandy loam soils. Habitats include the edges of a lignum swamp with box and mallee, creek banks in grey, silty clay, mallee and lignum sandy-loam flats, open Cypress Pine forest on low sandy ranges and a low, rocky rise. It is recorded in association with *Callitris glaucophylla, Eucalyptus microcarpa, E. populnea, Austrostipa eremophila, A. drummondii, Austrodanthonia eriantha* and *Einadia nutans.* | Present – site is open grassy woodland with clay based topsoil | Unlikely - Site has been extensively grazed. | No |
| **Herbs & Forbs** | | | | |
| Western Water-starwort<br>*Callitriche umbonata (previously Callitriche cyclocarpa)*<br>TSC-V | The Western Water-starwort is an aquatic or amphibious plant. The Western Water-starwort habitat information is scarce but is thought to prefer open woodland with open grassy understorey dominated by Moira Grass (*Paspalidium jubiflorum*) along river banks, and with wallaby grasses on ground less-frequently inundated. The | Absent | No | No |

[1] Information sourced from species profiles on NSW OEH's threatened species database or the Australian Government's Species Profiles and Threats database (SPRAT) unless otherwise stated.

OEH threatened species database: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx
SPRAT: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

| Species | Description of habitat1 | Presence of habitat | Likelihood of occurrence | Possible impact? |
|---|---|---|---|---|
| | distribution of this species overlaps with the following EPBC Act-listed threatened ecological communities:<br>• White Box – Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.<br>• Buloke Woodlands of the Riverina and Murrary-Daring Depression Bioregions. | | | |
| Small Scurf-pea<br>*Cullen parvum*<br>TSC-E | The Small Scurf-pea is a squat perennial herb with stems that more or less trail along the ground and that may reach 50 cm long. The Small Scurf-pea is generally associated with alluvial plains, creeks, ephemeral pools and river channels. It has also been reported from artificial drains and other disturbed sites. It grows in grassy woodland or open forest vegetation dominated by species of Eucalyptus, or in grasslands. | Present | Possible | No – not observed on site. |
| Narrow Goodenia<br>*Goodenia macbarronii*<br>EPBC-V | An annual or short-lived perennial herb to 30 cm tall. Grows on the western slopes of the Great Dividing Range in NSW, south from the Guyra and Inverell districts. It is widely distributed throughout the tablelands, western slopes and western plains. The species also occurs in north-eastern Victoria and the Darling Downs in Queensland. In NSW it has been recorded at Tingha, Guyra, the Warrumbungle Ranges, east of Rylstone, the Pilliga and Denobollie State Forests, the Narrabri, Coonabarabran, Torrington and Tocumwal districts, Grenfell, Weddin Mountain, Gungal, the Milthorpe district, and Holbrook (the Type locality). Flowers chiefly from October to March and is described as a short-lived annual herb. Narrow Goodenia is an annual which appears seasonally and opportunistically in ephemerally damp or wet sites and is often common at sites after good winter-rainfall periods. It favours moist, shaded, sandy sites, soils with impeded drainage, damp muddy areas of winter inundation, spring-fed paddocks and open areas where water is more available. Often found in sites with some form of recent disturbance, such as depressions and clearings made by grading and excavation along roadsides, open grazing land and paddocks inundated by weed species and areas previously cleared and grazed by cattle. Associated species at Goobang National Park sites include *Eucalyptus blakelyi, Eucalyptus sideroxylon, Eucalyptus bridgesiana, Eucalyptus melliodora, Acacia vestita, Acacia deanei* subsp. *paucijuga, Acacia penninervis, Acacia mollifolia, Acacia* | Absent | Unlikely | No |

| Species | Description of habitat1 | Presence of habitat | Likelihood of occurrence | Possible impact? |
|---|---|---|---|---|
| | *implexa, Callitris endlicheri, Leptospermum divaricatum, Exocarpos strictus, Allocasuarina diminuta* subsp. *diminuta, Pultenaea foliosa, Hibbertia obtusifolia, Hibbertia riparia, Baeckea cunninghamii* and *Lomandra longifolia*. Found to be uncommon and scattered within localised populations recorded in Goobang National Park. The species has been recorded as rare, scattered, locally common and frequent in populations, with the yellow-flowering plants forming a closed carpet in one population. | | | |
| Austral Pillwort<br>*Pilularia novae-hollandiae*<br>TSC-E | Austral Pillwort is a semi-aquatic fern, resembling a small fine grass. Its thread-like fronds, to 8 cm long, arise in tufts from a creeping underground stem (rhizome). Austral Pillwort grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous. Most of the records in the Albury-Urana area were from table drains on the sides of roads. The ACT record was from a subalpine grassy plain. This species is probably ephemeral (especially in the drier parts of its range), appearing when soils are moistened by rain. | Present | Unlikely - This species is considered highly unlikely to be present in the study area, despite a proximate occurrence. The habitat and associated vegetation community are different to those with which the species is associated. | No. |
| Woolly Ragwort<br>*Senecio garlandii*<br>TSC-V<br>EPBC-V | An erect perennial herb or subshrub growing to 2 m high but generally around 1 m high. Almost entirely known from the western slopes of the Great Dividing Range in southern NSW. In NSW known from a very localised strip from West Wyalong to the Albury district, in the Central Western Slopes and South Western Slopes regions. The site of greatest abundance appears to be The Rock NR, over 340 ha, about 30 km SE of Wagga Wagga. Has also been collected at Tabletop Range, a site "15 miles ESE of The Rock", Gidginbung, "near Albury", Flowerpot Hill (4 km S of The Rock NR), Ulandra NR (7 km SE of Bethungra), Benambra SF (20 km W of Holbrook), Burrinjuck and near Temora. Occurs in dry sclerophyll forest and open woodland in association with *Eucalyptus macrorhyncha, E. goniocalyx, Acacia doratoxylon, A. implexa* and *Brachychiton populneus*. Grows on the sheltered lower slopes or upper parts of south to east-facing slopes of isolated rocky outcrops. Primarily flowers in spring in NSW. | Absent | Unlikely - Proposal site is outside its known distribution | No |

| Species | Description of habitat1 | Presence of habitat | Likelihood of occurrence | Possible impact? |
|---|---|---|---|---|
| Slender Darling Pea<br>*Swainsona murrayana*<br>TSC – V | Found throughout NSW, it has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. It grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with Maireana species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.<br>The species may require some disturbance and has been known to occur in paddocks that have been moderately grazed or occasionally cultivated. | Absent | Unlikely | No |
| **Orchids** | | | | |
| Crimson Spider Orchid<br>*Caladenia concolor*<br>TSC-E | The Crimson Spider Orchid is from a group of orchids characterised by five long spreading petals and sepals around a broad down-curled labellum ('lip'). The current NSW Scientific Committee listing incorporates two populations which have each been described as separate species by D.L. Jones. One of these populations comprises a few hundred plants on private property near Bethungra and the other of about 100 plants occurs in Burrinjuck Nature reserve. The other occurrences of the Crimson Spider Orchid in NSW are in the Nail Can Hill Crown Reserve near Albury and from a small Crown land site north-west of Wagga Wagga. The species also occurs at two localities in Victoria near Beechworth and Chiltern. Habitat is regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids. The dominant trees are Blakely's Red Gum (*Eucalyptus blakelyi*), Red Stringybark (*E. macrorhyncha*), Red Box (*E. polyanthemos*) and White Box (*E. albens*); the diverse understorey includes Silver Wattle (*Acacia dealbata*), Hop Bitter-pea (*Daviesia latifolia*), Common Beard-heath (*Leucopogon virgatus*), Spreading Flax-lily (*Dianella revoluta*) and Poa Tussock (*Poa sieberiana*). This species is deciduous, producing a leaf during autumn or winter and after flowering in spring survives the dry summer and early autumn as a dormant tuber. Flowering does not take place every year for reasons | Absent | Unlikely | No |

| Species | Description of habitat1 | Presence of habitat | Likelihood of occurrence | Possible impact? |
|---|---|---|---|---|
| | that are not fully understood, though each plant probably lives for a considerable number of years. It is likely that fire is not a direct requirement of the species, but it may have a positive influence on seedling germination and establishment. | | | |
| Greencomb Spider-orchid<br>*Caladenia tensa*<br>EPBC-E | The Greencomb Spider-orchid is a perennial orchid growing to 30 cm in height when flowering. The Greencomb Spider-orchid grows on red-brown sandy loams on rises in open woodland dominated by Yellow Gum (Eucalyptus leucoxylon sens. lat.) and Rottnest Island Pine (Callitris preissii). Its habitat, between the Little Desert and Big Desert, was formerly expansive and extended into SA (Carr 1991). This species has also been recorded from Black Box (Eucalyptus largiflorens)/Yellow Gum woodland and mallee/heathland. More recently, the various habitats for the species has been described, including dry Cypress-pine (family Cupressaceae)/Yellow Gum Woodland, Pine/Box woodland, mallee-heath sites, heathy woodland and mallee woodland, generally with rock outcrops. | Present - Black Box Woodland occurs within the proposal area | Unlikely - Site has been extensively grazed. | No |
| **EECs** | | | | |
| Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions<br>EPBC E | The Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions occur substantially within the two named bioregions, which are described in the report edited by Thackway and Cresswell (1995). The woodlands are distributed widely across the bioregions, occurring in tracts or as patches within open forests or woodlands dominated by other species. A feature common to many areas where the woodlands occur is the presence of clayey and/or alkaline sub-soils. In many of the South Australian areas, massive calcrete underlies the sub-soil at depths of less than one metre. | Absent | Unlikely | No |

| Species | Description of habitat1 | Presence of habitat | Likelihood of occurrence | Possible impact? |
|---|---|---|---|---|
| Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia<br><br>EPBC-E | Predominantly occurs on the drier edge of the temperate grassy eucalypt woodland belt and ranges from central New South Wales through northern and central Victoria into South Australia. Generally occurs in landscapes of low-relief such as flat to undulating plains, low slopes and rises and, to a lesser extent, drainage depressions and flats. The ecological community may extend to more elevated hillslopes on the fringes of its range where it intergrades with other woodland or dry sclerophyll forest communities. Often occurs on productive soils derived from alluvial or colluvial materials but may occur on a range of substrates. The ecological community tends to occupy drier sites within the belt of grassy woodlands in south-eastern Australia (Prober and Thiele, 1993). The mean annual rainfall associated with the distribution of the ecological community lies in the range 375-700 mm/year. The typical structure of ecological community is a woodland to open forest with a canopy dominated by eucalypts and an understorey with a moderately dense to sparse shrub layer and a ground layer of perennial and annual native forbs and graminoids. Tussock grasses dominate the ground layer vegetation, though other graminoids or forbs may be common. Chenopods also may be present in the ground layer. Derived grasslands are a special state of the ecological community, whereby the canopy and mid layers have been mostly removed to <10% crown cover but the native ground layer remains largely intact, with 50% or more of the total vegetation cover being native. | Absent | Unlikely | No |
| Natural Grassland of the Murray Valley Plains<br><br>EPBC - CE | The Natural Grasslands of the Murray Valley Plains is a type of naturally treeless grassland occurring on the plains of western and northern Victoria (including the Victorian Riverina), extending into the southern parts of the Riverina in New South Wales. Although occurring near the Murray River and other major tributaries, it is a dryland ecological community occurring above the floodplains. | Absent | Unlikely | No |
| Weeping Myall Woodlands<br><br>EPBC-E | This ecological community is scattered across the eastern parts of the alluvial plains of the Murray-Darling river system. Typically, it occurs on red-brown earths and heavy textured grey and brown | Absent | Unlikely | No |

| Species | Description of habitat1 | Presence of habitat | Likelihood of occurrence | Possible impact? |
|---|---|---|---|---|
| | alluvial soils within a climatic belt receiving between 375 and 500 mm mean annual rainfall. The structure of the community varies from low woodland and low open woodland to low sparse woodland or open shrubland, depending on site quality and disturbance history. The tree layer grows up to a height of about 10 metres and invariably includes Acacia pendula (Weeping Myall or Boree) as one of the dominant species or the only tree species present. The understorey includes an open layer of chenopod shrubs and other woody plant species and an open to continuous groundcover of grasses and herbs. The structure and composition of the community varies, particularly with latitude, as chenopod shrubs are more prominent south of the Lachlan River district, while other woody species and summer grasses are more common further north. In some areas the shrub stratum may have been reduced or eliminated by clearing or heavy grazing. | | | |
| White Box Yellow Box Blakely's Red Gum Woodland<br>TSC-EEC<br>EPBC-CEEC | An open woodland community (sometimes occurring as a forest formation). Areas that are part of the Australian Government listed ecological community must have either: an intact tree layer and predominately native ground layer; or an intact native ground layer with a high diversity of native plant species but no remaining tree layer. Box-Gum Woodland is found from the Queensland border in the north, to the Victorian border in the south. It occurs in the tablelands and western slopes of NSW. The community occurs within the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands and NSW South Western Slopes Bioregions. Characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum. The trees may occur as pure stands, mixtures of the three species or in mixtures with other trees, including wattles. The tree-cover is generally discontinuous and consists of widely-spaced trees of medium height in which the canopies are clearly separated. The understorey in intact sites is characterised by scattered shrubs, native tussock grasses, and a high diversity of herbs. Remnants generally occur on fertile lower parts of the landscape where resources such as water and nutrients are abundant. Sites with particular characteristics, including varying age classes in the trees, patches of regrowth, old trees with hollows and fallen timber on the ground are very important as wildlife habitat. | Absent | Unlikely | No |

| Species | Description of habitat1 | Presence of habitat | Likelihood of occurrence | Possible impact? |
|---|---|---|---|---|
| | Sites in the lowest parts of the landscape often support very large trees which have leafy crowns and reliable nectar flows - sites important for insectivorous and nectar feeding birds. Sites that retain only a grassy groundlayer and with few or no trees remaining are important for rehabilitation, and to rebuild connections between sites of better quality. Remnants support many species of threatened fauna and flora. This ecological community occurs in areas where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils at altitudes of 170 metres to 1200 metres. | | | |
| The aquatic ecological community in the natural drainage system of the lower Murray River catchment | The lower Murray River endangered ecological community includes all native fish and aquatic invertebrates within all natural creeks, rivers, and associated lagoons, billabongs and lakes of the regulated portions of the Murray River (also known as the River Murray) downstream of Hume Weir, the Murrumbidgee River downstream of Burrinjuck Dam, the Tumut River downstream of Blowering Dam and all their tributaries anabranches and effluents including Billabong Creek, Yanco Creek, Colombo Creek, and their tributaries, the Edward River and the Wakool River and their tributaries, anabranches and effluents, Frenchmans Creek, the Rufus River and Lake Victoria. Excluded from this recommendation are the Lachlan River and the Darling River and their tributaries, and artificial canals, water distribution and drainage works, farm dams and off-stream reservoirs. | Present – along and within the Edward River | Present - along and within the Edward River | Yes – 7-Part Test prepared |

E TSC = listed as Endangered under Schedule 1 of the NSW *Threatened Species Conservation Act 1995*

E EPBC = listed as Endangered under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

V TSC = listed as Vulnerable under Schedule 2 of the NSW *Threatened Species Conservation Act 1995.*

V EPBC = listed as Vulnerable under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

EEC TSC = Endangered Ecological Community listed under Schedule 1 of the NSW *TSC Act 1995*

CE EPBC = listed as Critically Endangered under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

## C.2 EVALUATION OF THE LIKELIHOOD AND EXTENT OF IMPACT ON THREATENED FAUNA

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| **Birds** | | | | |
| Regent Honeyeater<br>*Anthochaera phrygia*<br>TSC-CE,<br>EPBC-E, Migratory | The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years non-breeding flocks converge on flowering coastal woodlands and forests. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River She-oak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast. The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, Blakely's Red Gum, White Box and Swamp Mahogany. Also utilises *E. microcarpa, E. punctata, E. polyanthemos, E. mollucana, Corymbia robusta, E. crebra, E. caleyi, Corymbia maculata, E. mckieana, E. macrorhyncha, E. laevopinea,* and *Angophora floribunda*. Nectar and fruit from the mistletoes *A. miquelii, A. pendula* and *A. cambagei* are also eaten during the breeding season. When nectar is scarce lerp and honeydew comprise a large proportion of the diet. A shrubby understorey is an important source of insects and nesting material. The species breeds between July and January in Box-Ironbark and other temperate woodlands and riparian | Absent - Temperate woodland and associated tree species (Grey Box) absent at proposal site. | Unlikely | No |

[2] Information sourced from species profiles on NSW OEH's threatened species database or the Australian Government's *Species Profiles and Threats* database (SPRAT) unless otherwise stated.

OEH threatened species database: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx
SPRAT: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| | gallery forest dominated by River Sheoak. Regent Honeyeaters usually nest in horizontal branches or forks in tall mature eucalypts and Sheoaks. Also nest in mistletoe haustoria. | | | |
| Australian Bustard<br>*Ardeotis australis*<br>TSC-E | The Australian Bustard is a bird of the inland and tropical north of mainland Australia. It is also found in southern New Guinea. Australian Bustards are found on dry plains, grasslands and in open woodland. | Absent | Unlikely | No |
| Australasian Bittern<br>*Botaurus poiciloptilus*<br>TSC-E<br>EPBC-E | In NSW, this species occurs along the coast and is frequently recorded in the Murray-Darling Basin, notably in floodplain wetlands of the Murrumbidgee, Lachlan, Macquarie and Gwydir Rivers. Occurs in permanent freshwater wetlands with tall, dense vegetation. Favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and/or reeds (e.g. *Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, , Bolboschoenus*) or cutting grass (*Gahnia*) growing over muddy or peaty substrate. Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Feeding platforms may be constructed over deeper water from reeds trampled by the bird; platforms are often littered with prey remains. Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds; there are usually six olive-brown eggs to a clutch. In Australia, the Bittern occurs with the Australian Painted Snipe *Rostratula benghalensis australis.* | Absent- Tall, dense vegetation and reeds are not present in the proposal area. | Unlikely- Species preferred habitat not present at site. The species has not been recorded within 10km of the proposal site. | No |
| Bush Stone-curlew<br>*Burhinus grallarius*<br>TSC-E | The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch. Two eggs are laid in spring and early summer. | Present - Open woodlands with a sparse grassy groundlayer and fallen timber are found in the proposal area. | Unlikely- The species has not been recorded within 10km of the proposal site. | No |
| Pied Honeyeater<br>*Certhionyx variegates*<br>TSC-V | Certhionyx variegates is widespread throughout acacia, mallee and spinifex scrubs of arid and semi-arid Australia. They occasionally occur further east, on the slopes and plains and the Hunter Valley, typically during periods of drought. The species is highly nomadic, following the erratic flowering of shrubs and can be locally common at times. They typically construct a relatively large cup-shaped nest , usually robust, although occasionally loose, | Absent | Unlikely- – Suitable habitat doesn't occur on site. | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| | constructed of grasses and fine twigs, bound with spider webs, in the fork of a shrub or tree up to 5 m above the ground. | | | |
| Spotted Harrier<br>*Circus assimilis*<br>TSC-V | The Spotted Harrier occurs throughout the Australian mainland, except in densly forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months. Preys on terrestrial mammals (e.g. bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion. | Present | Possible- – This species may occur of fly over the proposal area from time to time, however it is unlikely to rely on the habitat for foraging or breeding purposes. | No |
| Brown Treecreeper (eastern subspecies)<br>*Climacteris picumnus victoriae*<br>TSC-V | The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. The western boundary of the range of *Climacteris picumnus victoriae* runs about through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell and along this line the subspecies intergrades with the arid zone subspecies of Brown Treecreeper *Climacteris picumnus* which then occupies the remaining parts of the state. The eastern subspecies lives in eastern NSW in eucalypt woodlands through central NSW and in coastal areas with drier open woodlands such as the Snowy River Valley, Cumberland Plains, Hunter Valley and parts of the Richmond and Clarence Valleys.The population density of this subspecies has been greatly reduced over much of its range, with major declines recorded in central NSW and the northern and southern tablelands. Declines have occurred in remnant vegetation fragments smaller than 300 hectares that have been isolated or fragmented for more than 50 years. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the | Present | Possible- – This species may use proposal area from time to time. | Yes – 7-Part test prepared |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| | coastal ranges and plains. | | | |
| Grey Falcon<br>*Falco hypoleucus*<br>TSC-E | The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. The species is usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. They also occur near wetlands where surface water attracts prey. They utilise old nests of other birds of prey and ravens, usually high in a living eucalypt. Peak laying season is in late winter and early spring. | Present | Possible – The Grey Falcon may occur of fly over the proposal area from time to time, however it is unlikely to rely on the habitat for foraging or breeding purposes. | No |
| Black Falcon<br>*Falco subniger*<br>TSC-V | The Black Falcon inhabits woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded watercourses and agricultural land with scattered remnant trees. The Black Falcon is usually associated with streams or wetlands, visiting them in search of prey and often using standing dead trees as lookout posts. Habitat selection is generally influenced more by prey densities than by specific aspects of habitat floristics or condition, although in agricultural landscapes the Black Falcon tends to nest in healthy, riparian woodland remnants with a diverse avi-fauna | Present | Possible – The Black Falcon may occur of fly over the proposal area from time to time, however it is unlikely to rely on the habitat for foraging or breeding purposes. | No |
| Purple-crowned Lorikeet<br>*Glossopsitta prophyrocephala*<br>TSC- V | The Purple-crowned Lorikeet occurs only southern Australia, where it can be seen in southern New South Wales and much of Victoria, through southern parts of South Australia, including the Flinders Ranges, and in southern Western Australia. Although they prefer dry eucalypt forests, woodlands and shrublands, Purple-crowned Lorikeets can also be seen in parks and gardens of towns and suburbs. | Present | Possible – This species may use proposal area from time to time. | No – very limited disturbances to habitat proposed. The species is also disturbance tolerant and would continue to persist if it was present in the proposal area. |
| Little Lorikeet<br>*Glossopsitta pusilla*<br>TSC- V | The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability. Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophoras, Melaleucas and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also | Present | Possible – This species may use proposal area from time to time. | Yes – 7-Part test prepared |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| | help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like Allocasuarina. Nesting season extends from May to September. | | | |
| Painted Honeyeater<br>*Grantiella picta*<br>TSC-V<br>EPBC-V | The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches**.** | Absent | Unlikely | No |
| Brolga<br>*Grus rubicunda*<br>TSC-V | The Brolga was formerly found across Australia, except for the south-east corner, Tasmania and the south-western third of the country. It is still abundant in the northern tropics, but very sparse across the southern part of its range. Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they will forage with their head entirely submerged. | Absent | Unlikely | No |
| Black-breasted Buzzard<br>*Hamirostra melanosternon*<br>TSC-V | The Black-breasted Buzzard is found sparsely in areas of less than 500mm rainfall, from north-western NSW and north-eastern South Australia to the east coast at about Rockhampton, then across northern Australia south almost to Perth, avoiding only the Western Australian deserts. Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Also hunts over grasslands and sparsely timbered woodlands. Not a powerful hunter, despite its size, mostly taking reptiles, small mammals, birds, including nestlings, and carrion. Also specialises in feeding on large eggs, including those of emus, which it cracks on a rock. Breeds from August to October near water in a tall tree. The stick nest is large | Present | Possible- – This species may occur of fly over the proposal area from time to time, however it is unlikely to rely on the habitat for foraging or breeding purposes. | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| | and flat and lined with green leaves. Normally two eggs are laid. | | | |
| Little Eagle<br>*Hieraaetus morphnoides*<br>TSC-V | The Little Eagle is a medium-sized bird of prey that is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion. | Present | Possible – This species may occur of fly over the proposal area from time to time, however it is unlikely to rely on the habitat for foraging or breeding purposes. | No |
| Swift Parrot<br>*Lathamus discolor*<br>TSC-E<br>EPBC-E | Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*. Return to home foraging sites on a cyclic basis depending on food availability. | Present | Unlikely – proposal site outside likely range of this species. | No |
| Square-tailed Kite<br>*Lophoictinia isura*<br>TSC-V | The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. Appears to occupy large hunting ranges of more than 100km2. Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs. | Present | Possible- – This species may occur of fly over the proposal area from time to time, however it is unlikely to rely on the habitat for foraging or breeding purposes. | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| Pink Cockatoo<br>*Lophochroa leadbeateri*<br>TSC-V | Found across the arid and semi-arid inland, from south-western Queensland south to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. Normally found in pairs or small groups, though flocks of hundreds may be found where food is abundant. Nesting, in tree hollows, occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 square kilometres. | Absent - Wattles and cypress pines absent in the study area. | Unlikely– The species has not been recorded within 10km of the study area | No |
| Hooded Robin (south-eastern form)<br>*Melanodryas cucullata*<br>TSC-V | The Hooded Robin is common in few places, and rarely found on the coast. It is considered a sedentary species, but local seasonal movements are possible. The south-eastern form is found from Brisbane to Adelaide throughout much of inland NSW, with the exception of the north-west. The species is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season. May breed any time between July and November, often rearing several broods. The nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1 m to 5 m above the ground. The nest is defended by both sexes with displays of injury-feigning, tumbling across the ground. A clutch of two to three is laid and incubated for fourteen days by the female. Two females often cooperate in brooding. | Present | Possible – This species may use proposal area from time to time. | Yes – 7-Part test prepared |
| Black-chinned Honeyeater (eastern subspecies)<br>*Melithreptus gularis*<br>TSC-V | The subspecies is widespread, from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond River district. It has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions. Occupies mostly upper levels of drier open forests or woodlands dominated | Absent | Unlikely | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| | by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*Eucalyptus albens*), Grey Box (*Eucalyptus microcarpa*), Yellow Box (*Eucalyptus melliodora*) and Forest Red Gum (*Eucalyptus tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks and tea-trees. A gregarious species usually seen in pairs and small groups of up to 12 birds. Feeding territories are large making the species locally nomadic. Recent studies have found that the Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares. Moves quickly from tree to tree, foraging rapidly along outer twigs, underside of branches and trunks, probing for insects. Breeds solitarily or co-operatively, with up to five or six adults, from June to December. The nest is placed high in the crown of a tree, in the uppermost lateral branches, hidden by foliage. It is a compact, suspended, cup-shaped nest. Two or three eggs are laid and both parents and occasionally helpers feed the young. | | | |
| Turquoise Parrot<br>*Neophema pulchella*<br>TSC-V | The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Usually seen in pairs or small, possibly family, groups and have also been reported in flocks of up to thirty individuals. Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Forages quietly and may be quite tolerant of disturbance. However, if flushed it will fly to a nearby tree and then return to the ground to browse as soon as the danger has passed. Nests in tree hollows, logs or posts, from August to December. It lays four or five white, rounded eggs on a nest of decayed wood dust. | Present | Possible – This species may use proposal area from time to time. | Yes – 7-Part test prepared |
| Powerful Owl<br>*Ninox strenua*<br>TSC-V | The Powerful Owl is endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria. In NSW the Powerful Owl lives in forests and woodlands occurring in the coastal, escarpment, tablelands and western slopes environments. Specific habitat requirements include eucalypt forests and woodlands on productive sites on gentle terrain; a mosaic of moist and dry types, with mesic gullies and permanent streams; presence of leafy sub-canopy trees or tall shrubs for roosting; presence of large old trees to provide nest hollows. Optimal habitat includes a tall shrub layer and abundant hollows supporting high densities of arboreal marsupials. Roosts in groves of dense mid-canopy trees or tall shrubs in sheltered gullies, typically on wide | Present - Roosting and habitat present. Species for hollows are present. | Possible – This species may use proposal area from time to time. | Yes – 7-Part test prepared |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| | creek flats and at the heads of minor drainage lines, but also adjacent to cliff faces and below dry waterfalls. Species commonly used for roosting include the She-oaks *Allocasuarina* spp., rainforest species such as Coachwood *Ceratopetalum apetalum*, Lilly Pilly *Acmena smithii* and Sassafras *Doryphora sassafras*, Black Wattle *Acacia melanoxylon*, Turpentine *Syncarpia glomulifera* and eucalypts. Roosting sites are commonly among small groves of up to 2 ha of similar-sized trees with dense foliage in the height range 3-15 m. Nests in old hollow eucalypts in unlogged, unburnt gullies and lower slopes within 100 m of streams or minor drainage lines, with hollows greater than 45 cm diameter and greater than 100 cm deep; surrounded by canopy trees and subcanopy or understorey trees or tall shrubs. Hollow entrances are greater than 6 m above ground, commonly more than 20 m where the forest permits, in trees of at least 80 cm diameter at breast height. During the breeding season, the male Powerful Owl roosts in a "grove" of up to 20-30 trees, situated within 100-200 metres of the nest tree where the female shelters. Nesting occurs from late autumn to mid-winter, but is slightly earlier in north-eastern NSW (late summer - mid autumn). The Powerful Owl is highly sensitive to nest disturbance during the egg and chick stages and will readily abandon the nest if disturbed. Home range has been estimated as 300-1500 ha according to habitat productivity. Moist forest in unlogged corridors in gully systems is used for nesting and roosting, and also preferentially for foraging although much foraging is also conducted in dry and regrowth forest. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. | | | |
| Blue-billed Duck<br>*Ocyura australis*<br>TSC-V | The Blue-billed Duck is endemic to Australia, being found in the temperate wetlands of the south-east and south-west parts of the continent. The Blue-billed Duck is almost wholly aquatic, and is seldom seen on land. Non-breeding flocks, often with several hundred individuals, congregate on large, deep open freshwater dams and lakes in autumn. The daylight hours are spent alone in small concealed bays within vegetation or communally in large exposed rafts far from the shore. Blue-billed Ducks breed in secluded, densely vegetated situations with the nest constructed in cumbungi (bullrushes, Typha sp.) beds or other vegetation generally over water. | Absent | Unlikely | No. |
| Gilbert's Whistler<br>*Pachycephala inornata*<br>TSC-V | The Gilbert's Whistler is sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western slopes of NSW to the Western Australian wheatbelt. The species was probably once distributed almost continuously across the woodlands and mallee of southern NSW, but this range has been greatly reduced, chiefly by clearance of habitat. The | Absent–<br>Woodlands within the study area are lacking structural diversity particularly a | Unlikely –<br>This species has not been recorded within 10 km of the study area. | No. |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| | Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests, though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers. Within the mallee the species is often found in association with an understorey of spinifex and low shrubs including wattles, hakeas, sennas and hop-bushes. In woodland habitats, the understorey comprises dense patches of shrubs, particularly thickets of regrowth *Callitris* pine. Parasitic 'cherries' (*Exocarpus* species) appear to be an important habitat component in Belah and Red Gum communities, though in the latter case other dense shrubs, such as Lignum and wattles, are also utilised. The Gilbert's Whistler forages on or near the ground in shrub thickets and in tops of small trees. Its food consists mainly of spiders and insects such as caterpillars, beetles and ants, and occasionally, seeds and fruits are eaten. Breeding takes place between August and November. Nests are usually built below about two and a half metres (but up to six metres) above the ground in the fork of dense foliage of plants such as wattles or cypress pines. At Cowra three pairs nested in a 25 ha area. The nest is either a lined cup or sometimes birds use the old nests of other species, particularly disused babblers' nests. Two, three or occasionally four eggs are laid. The movements of this species are poorly known but it is believed that generally it does not make any regular large-scale movements and pairs may hold and defend territories all year round. However, the occasional record outside the normal distribution may indicate some dispersal does occur, particularly given the difficulty in detecting this species outside the breeding season when it isn't calling. | dense shrub layer. | | |
| Plains-wanderer<br>*Pedionomus torquatus*<br>EPBC-CE | The Plains-wanderer inhabits sparse, treeless, lowland native grasslands with approximately 50% bare ground, most vegetation less than 5 cm in height, with some widely-spaced plants up to 30 cm high. These sparse native grasslands usually occur on hard, red-brown clay soils that do not support dense pasture growth under any conditions. The (approximately) 50% cover typically consist of 40% grasses and herbs, and 10% organic litter. The majority of the vegetation is less than 5 cm tall, but larger plants, mostly up to 30 cm tall, and generally spaced 10 to 20 cm apart, are important because they provide shelter from predators. The grasslands can support a variety of ephemeral and perennial species of grasses and herbs including, in the Riverina region, *Austrodanthonia caespitosa, Calocephalus sonderi, Chloris truncata, Vulpia myuros, Maireana pentagona, Austrostipa variabilis and* | Absent | Unlikely | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| | *Hordeum leporinum* (different species are found in arid habitats). However, the composition of plant species in grasslands occupied by the Plains-wanderer is very similar to that found in dense native grasslands that are not occupied by the Plains-wanderer, which suggests that the structure of the grassland is more important than the species composition in determining its suitability for the Plains-wanderer. | | | |
| Scarlet Robin<br>*Petroica boodang*<br>TSC-V | The Scarlet Robin is found from SE Queensland to SE South Australia and also in Tasmania and SW Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. The Scarlet Robin is a quiet and unobtrusive species which is often quite tame and easily approached. Birds forage from low perches, fence-posts or on the ground, from where they pounce on small insects and other invertebrates which are taken from the ground, or off tree trunks and logs; they sometimes forage in the shrub or canopy layer. Scarlet Robin pairs defend a breeding territory and mainly breed between the months of July and January; they may raise two or three broods in each season. This species' nest is an open cup made of plant fibres and cobwebs and is built in the fork of tree usually more than 2 metres above the ground; nests are often found in a dead branch in a live tree, or in a dead tree or shrub. Eggs are pale greenish-, bluish- or brownish-white, spotted with brown; clutch size ranges from one to four. Birds usually occur singly or in pairs, occasionally in small family parties; pairs stay together year-round. In autumn and winter, the Scarlet Robin joins mixed flocks of other small insectivorous birds which forage through dry forests and woodlands. | Present | Possible – This species may use proposal area from time to time foraging but unlikely to rely on the area for breeding. | Yes – 7-Part test prepared |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| Flame Robin<br>*Petroica phoenicea*<br>TSC-V | The Flame Robin is endemic to SE Australia, and ranges from near the Queensland border to SE South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains). Often occurs in recently burnt areas; however, habitat becomes unsuitable as vegetation closes up following regeneration. In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees. In winter, occasionally seen in heathland or other shrublands in coastal areas. Birds forage from low perches, from which they sally or pounce onto small invertebrates which they take from the ground or off tree trunks, logs and other coarse woody debris. Flying insects are often taken in the air and sometimes gleans for invertebrates from foliage and bark. In their autumn and winter habitats, birds often sally from fence-posts or thistles and other prominent perches in open habitats. Occur singly, in pairs, or in flocks of up to 40 birds or more; in the non-breeding season they will join up with other insectivorous birds in mixed feeding flocks. Breeds in spring to late summer. Nests are often near the ground and are built in sheltered sites, such as shallow cavities in trees, stumps or banks. Builds an open cup nest made of plant materials and spider webs. | Present | Possible – This species may use proposal area from time to time foraging but unlikely to rely on the area for breeding. | Yes – 7-Part test prepared |
| Regent Parrot<br>*Polytelis anthopeplus monarchoides*<br>TSC-E<br>EPBC-V | The Regent Parrot (eastern) primarily inhabits riparian or littoral River Red Gum (Eucalyptus camaldulensis) forests or woodlands and adjacent Black Box (E. largiflorens) woodlands. Nearby open mallee woodland or shrubland, usually with a ground cover of spinifex (Triodia) or other grasses, supporting various eucalypts, especially Christmas Mallee (E. socialis) and Yellow Mallee (E. costata) Mallee, as well as Belah (Allocasuarina cristata), Buloke (A. leuhmannii) or Slender Cypress Pine (Callitris preissii) also provide important habitat for this subspecies. They often occur in farmland, especially if the farmland supports remnant patches of woodland along roadsides or in paddocks. The subspecies seldom occurs in more extensively cleared areas | Present | Possible – This species may use proposal area from time to time. | Yes – 7-Part test prepared |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| Superb Parrot<br>*Polytelis swainsonii*<br>TSC-V<br>EPBC-V | The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. It is estimated that there are less than 5000 breeding pairs left in the wild. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Because the Superb Parrots often use different habitats for different activities, the timing of their occurrence in each habitat may vary with the time of year. Between mid-January and early April, Superb Parrots do not use the River Red Gum breeding habitats on the Edward and Murrumbidgee Rivers, and their whereabouts at this time is unknown. Between April and August, they inhabit forests and woodlands dominated by River Red Gum, box-gum, White Cypress Pine (*Callitris glaucophylla*) and Boree. Nest in small colonies, often with more than one nest in a single tree. Breed between September and January. May forage up to 10 km from nesting sites, primarily in grassy box woodland. Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain. When foraging on the ground, Superb Parrots often eat the seeds of plants such as the native Ringed Wallaby-grass (*Danthonia caespitosa*), barley-grasses (*Critesion*), as well as cereal crops including wheat, oats and canola (*Brassica napus*); and spilt grain. They also eat the seed-pods of many understorey species of wattles such as Gold-dust Wattle (*Acacia acinacea*), Silver Wattle (*A. dealbata*) and Deane's Wattle (*A. deanei*) and cultivated Cootamundra Wattle (*A. baileyana*). When foraging in the forest canopy, Superb Parrots eat the flowers and fruits of eucalypts, especially in spring and summer, the berries of mistletoe, such as Box Mistletoe (*Amyema miquelii*) and Grey Mistletoe (*A. quandang*), and, in winter, lerps from the foliage of eucalypts. | Present | Possible – This species may use proposal area from time to time. | Yes – 7-Part test prepared |
| Night Parrot | The Night Parrot inhabits arid and semi-arid areas that are characterised by having dense, low vegetation. Based on accepted records, the habitat of the | Absent | Unlikely | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| *Polytelis occidentalis*<br>EPBC-E | Night Parrot consists of Triodia grasslands in stony or sandy environments | | | |
| Grey-crowned Babbler (eastern subspecies)<br>*Pomatostomus temporalis*<br>TSC-V | The Grey-crowned Babbler has two distinctive subspecies that intergrade to the south of the Gulf of Carpentaria. West of here the subspecies *rubeculus*, formerly considered a separate species (Red-breasted Babbler) is still widespread and common. The eastern subspecies (*temporalis* occurs from Cape York south through Queensland, NSW and Victoria and formerly to the south east of South Australia. This subspecies also occurs in the Trans-Fly Region in southern New Guinea. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Flight is laborious so birds prefer to hop to the top of a tree and glide down to the next one. Birds are generally unable to cross large open areas. Live in family groups that consist of a breeding pair and young from previous breeding seasons. A group may consist of up to fifteen birds. Feed on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses. Build and maintain several conspicuous, dome-shaped stick nests about the size of a football. A nest is used as a dormitory for roosting each night. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts. Nests are maintained year round, and old nests are often dismantled to build new ones. Breed between July and February. Usually two to three eggs are laid and incubated by the female. Territories range from one to fifty hectares (usually around ten hectares) and are defended all year. | Present –Box-Gum Woodlands are present in the proposal area. | Possible – This species may use proposal area from time to time. | Yes – 7-Part test prepared |
| Australian Painted Snipe<br>*Rostratula australis (formerly Rostratula benghalensis australis)* | Little is known of the ecology, habitat requirements and reproductive biology of Australian Painted Snipe. They feed in shallow water or at the waters' edge and on mudflats, taking seeds and invertebrates such as insects, worms, molluscs and crustaceans. Females, which are larger and more brightly coloured than males, are thought to sometimes be polyandrous, mating with several males and leaving each one to incubate and raise chicks. They lay 3-4 | Absent | Unlikely- – t The species has not been recorded within 10km of the study area | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| TSC- E<br><br>EPBC-V, Marine, Migratory | eggs per clutch and incubation lasts about 15-16 days. Most records of Australian Painted Snipe are from temporary or infrequently filled freshwater wetlands and although they have occurred at many sites, no site can be identified in which they are resident or regular in occurrence. This may suggest the species is nomadic but the extent to which its cryptic behaviour may contribute to this belief is uncertain. The birds are able to remain hidden in rank vegetation, but many reports are of birds not being secretive, but rather still and unobtrusive. Primarily occurs along the east coast from north Queensland (excluding Cape York) to the Eyre Peninsula in South Australia, including the majority of Victoria and NSW. In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin. Inhabits inland and coastal shallow freshwater wetlands. The species occurs in both ephemeral and permanent wetlands, particularly where there is a cover of vegetation, including grasses, Lignum and Samphire. Individuals have also been known to use artificial habitats, such as sewage ponds, dams and waterlogged grassland. Nests on the ground amongst tall vegetation, such as grass tussocks or reeds. Forages nocturnally on mud flats and in shallow water. Breeding is often in response to local conditions; generally occurs from September to December. | | | |
| Diamond Firetail<br><br>*Stagonopleura guttata*<br><br>TSC-V | The Diamond Firetail is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW. Also found in the Australian Capital Territory, Queensland, Victoria and South Australia. Groups separate into small colonies to breed, between August and January. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Usually encountered in flocks of between five to 40 birds, occasionally more. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for | Present | Possible – This species may use proposal area from time to time foraging but unlikely to rely on the area for breeding. | Yes – 7-Part test prepared |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| | roosting. Appears to be sedentary, though some populations move locally, especially those in the south. Has been recorded in some towns and near farm houses. | | | |
| Freckled Duck<br>*Stictonetta naevosa*<br>TSC-V | The Freckled Duck is found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Generally, rest in dense cover during the day, usually in deep water. Feed at dawn and dusk and at night on algae, seeds and vegetative parts of aquatic grasses and sedges and small invertebrates. | Present | Unlikely – suitable habitat not present on site | No |
| Masked Owl<br>*Tyto novaehollandiae*<br>TSC-V | Extends from the coast where it is most abundant to the western plains. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. Habitat for this species is also widespread throughout the dry eucalypt forests of the tablelands, western slopes and the undulating wet-dry forests of the coast. Optimal habitat includes an open understorey and a mosaic of sparse (grassy) and dense (shrubby) ground cover on gentle terrain. Roosts in hollows in live or occasionally dead eucalypts; dense foliage in gullies; and caves. Nest in old hollow eucalypts, live or dead, in a variety of topographic positions, with hollows greater than 40 cm wide and greater than 100 cm deep. Hollow entrances are at least 3 m above ground, in trees of at least 90 cm diameter at breast height. A specialist predator of terrestrial mammals, particularly native rodents. Home range has been estimated as 400-1000 ha according to habitat productivity. | Absent - Dry eucalypt forest present in the study area. Dense shrubs and hollows are not present in the study site. | Unlikely | No |
| **Migratory Birds** | | | | |
| Fork-tailed Swift<br>*Apus pacificus*<br>FM-E<br>EPBC-E | In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. The sometimes occur above rainforests, wet sclerophyll forest or open | Absent | Unlikely | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| | forest or plantations of pines. | | | |
| Latham's Snipe<br>*Gallinago hardwickii*<br>EPBC-M | In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity. Latham's Snipe occurs in temperate and tropical regions of Australia. Its altitudinal range extends from sea-level (i.e. the coast) or possibly below. For example, there are records from near Lake Eyre to approximately 2000 m above sea-level. | Present | Unlikely - This species may occur of fly over the proposal area from time to time, however it is unlikely to rely on the habitat for foraging or breeding purposes. | No |
| White-throated Needletail<br>*Hirundapus caudacutus*<br>EPBC – M | In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. | Present | Unlikely - This species may occur of fly over the proposal area from time to time, however it is unlikely to rely on the habitat for foraging or breeding purposes. | No |
| Yellow Wagtail<br>*Motacilla Flava*<br>EPBC - M | The Yellow Wagtail is a regular wet season visitor to northern Australia. Increasing records in NSW suggest this species is an occasional but regular summer visitor to the Hunter River region.<br>Habitat requirements for the Yellow Wagtail are highly variable but typically include open grassy flats near water.<br>Habitats include open areas with low vegetation such as grasslands, airstrips, pastures, sports fields; damp open areas such as muddy or grassy edges of wetlands, rivers, irrigated farmland, dams, waterholes; sewage farms, sometimes utilise tidal mudflats and edges of mangroves. | Absent | Unlikely | No |
| Satin Flycatcher<br>*Myiagra cyanoleuca*<br>EPBC – M | Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. Satin Flycatchers mainly inhabit eucalypt forests, often near wetlands or watercourses. They generally occur in moister, taller forests than the Leaden Flycatcher, Myiagra rebecula, often occurring in gullies.<br>They also occur in eucalypt woodlands with open understorey and grass ground cover, and are generally absent from rainforest. In south-eastern Australia, they occur at elevations of up to 1400 m above sea level, and in the | Absent | Unlikely | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
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| | ACT, they occur mainly between 800 m above sea level and the tree line. | | | |
| Osprey<br>*Pandion haliaetus*<br>EPBC – M | Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging | Absent | Unlikely | No |
| Common Greenshank<br>*Tringa nebularia*<br>EPBC – M | The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees. It was once recorded with Black-winged Stilts (Himantopus himantopus) in pasture, but are generally not found in dry grassland | Absent | Unlikely | No |
| **Fish** | | | | |
| No fish habitat present. | | | | |
| **Mammals** | | | | |
| Little Pied Bat<br>*Chalinolobus picatus*<br>TSC-V | The Little-Pied Bat is found in inland Queensland and NSW (including Western Plains and slopes) extending slightly into South Australia and Victoria. Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress-pine forest, mallee, Bimbil box. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings. Can tolerate high temperatures and dryness but need access to nearby open water. Feeds on moths and possibly other flying invertebrates. | Present | Possible | Yes – 7-Part test prepared |
| Spot-tailed Quoll<br>*Dasyurus maculatus* | Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow- | Present | Unlikely – proposal is located in an urban area and unlikely to support sufficient habitat for this | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| TSC-V<br>EPBC-E | bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. Mostly nocturnal, although will hunt during the day; spends most of the time on the ground. The home-range of this species is unknown, but estimates are between 800ha and 20km$^2$. Usually traverse their ranges along densely vegetated creeklines. They need suitable den sites and abundant food, requiring large areas of intact vegetation for foraging. Use 'latrine sites', often on flat rocks among boulder fields and rocky cliff-faces; latrine sites can be recognised by the accumulation of the sometimes characteristic 'twisty-shaped' faeces deposited by animals. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits and insects; also eats carrion and takes domestic fowl. | | species | |
| Southern Myotis<br>*Myotis macropus*<br>TSC-V | The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.<br>Forage over streams and pools catching insects and small fish by raking their feet across the water surface. | Absent | Unlikely | No |
| Corben's Long-eared Bat<br>*Nyctophilus Corbeni*<br>TSC-V<br>EPBC-V | Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species.<br>It Inhabits a variety of vegetation types, including mallee, bulloke (*Allocasuarina leuhmanni*) and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark. Slow flying agile bat, utilising the understorey to hunt non-flying prey - especially caterpillars and beetles - and will even hunt on the ground. Mating takes place in autumn with one or two young born in late spring to early summer. | Present | Possible | Yes – 7-Part test prepared |
| Squirrel Glider<br>*Petaurus norfolcensis*<br>TSC-V | The Squirrel Glider is sparsely distributed along the east coast and immediate inland districts from western Victoria to north Queensland. The species is found inland as far as the Grampians in Victoria and the Pilliga and the Coonabarabran areas of NSW. Inhabits dry sclerophyll forest and woodland and is generally absent from rainforest and closed forest. In NSW, potential habitat includes Box-Ironbark forests and woodlands in the west, the River Red Gum forests of the Murray Valley and the eucalypt forests of the | Present | Possible | Yes – 7-Part test prepared |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| | northeast. Requires abundant hollow-bearing trees and a mix of eucalypts, acacias and banksias. Nightly movements are estimated at between 300 and 500m. Home-ranges have been estimated at between 0.65 and 8.55ha. Smooth-barked eucalypts are preferred as these eucalypts form hollows more readily than rough-barked and support a greater diversity of invertebrates. Squirrel Glider's forage in the upper and lower forest canopies and in the shrub understorey. | | | |
| Brush-tailed Phascogale<br>*Phascogale tapoatafa*<br>TSC-V | Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. Occurs primarily where the annual rainfall exceeds 500mm. Agile climber foraging preferentially in rough barked trees of 25 cm DBH or greater. Feeds mostly on arthropods but will also eat other invertebrates, nectar and sometimes small vertebrates. Females have exclusive territories of about 20 - 60 ha, while males have overlapping territories of up to 100 ha. Nest and shelter in tree hollows with entrances 2.5 - 4 cm wide and use many different hollows over a short time span. Also shelter in globular nests or possum drays. Mating occurs May - July; males die soon after the mating season whereas females can live for up to three years but generally only produce one litter. | Present | Unlikely – proposal is located in an urban area and unlikely to support sufficient habitat for this species | No |
| Koala<br>*Phascolarctos cinereus*<br>TSC-V | Occurs in eastern Australia, from north-eastern Queensland to south-eastern South Australia and to the west of the Great Dividing Range. In NSW it mainly occurs on the central and north coasts with some populations in the western region. It was historically abundant on the south coast of NSW, but now occurs in sparse and possibly disjunct populations. The koala inhabits a range of eucalypt forest and woodland communities, including coastal forests, the woodlands of the tablelands and western slopes, and the riparian communities of the western plains. Examples of important shelter trees are cypress pine and brush box. The quality of forest and woodland communities as habitat for koalas is influenced by a range of factors, such as; species and size of trees present; structural diversity of the vegetation; soil nutrients; climate and rainfall; size and disturbance history of the habitat patch. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size. Breeding season for the koala peaks between September and February. | Present | Unlikely – no nearby records | No |
| Yellow-bellied Sheathtail- | The Yellow-bellied Sheathtail-bat is a wide-ranging species found across | Present | Possible | Yes – 7-Part test |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| bat<br>*Saccolaimus flaviventris*<br>TSC-V | northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Breeding has been recorded from December to mid-March, when a single young is born. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn. | | | prepared |
| **Amphibians** | | | | |
| Growling grass frog<br>*Litoria raniformis*<br>EPBC – V | In NSW and the ACT, the range of the species was centred on the Murray and Murrumbidgee River valleys and their tributaries. The species is currently widespread throughout the Murray River valley and has been recorded from six Catchment Management Areas in NSW: Lower Murray Darling, Murrumbidgee, Murray, Lachlan, Central West and South East This species is found mostly amongst emergent vegetation including Typha sp. (bullrush), Phragmites sp. (reeds) and Eleocharis sp.(sedges), in or at the edges of still or slow-flowing water bodies such as lagoons, swamps, lakes, ponds and farm dams. The Growling Grass Frog can be found floating in warmer waters in temperatures between 18–25°C.<br>Additionally, this species occurs in, clays or well-watered sandy soils, open grassland, open forest, and ephemeral and permanent non-saline marshes and swamps, montane eucalypt forest, dry schlerophyll forest in coastal Victoria, steep-banked water edges (like ditches and drains) and gently graded edges containing fringing plants; and formerly, areas of high altitudes. | Absent | Unlikely | No |
| **Reptiles** | | | | |
| Pink-tailed Legless Lizard<br>*Aprasia parapulchella*<br>TSC-V<br>EPBC-V | Only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong. This species is also found in the Australian Capital Territory. Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well-drained, with | Absent - Sloping, open woodland areas and rocky out crops are not present in the study area. predominantly native grassy groundlayers are not present in the proposal | Unlikely–– The species has not been recorded within a 10 km radius of the study area. | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| | rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites. Feeds on the larvae and eggs of the ants with which it shares its burrows. It is thought that this species lays 2 eggs inside the ant nests during summer; the young first appear in March. Best detected from September to February. | area. | | |
| *Delma impar*<br>Striped Legless Lizard<br>TSC-V<br>EPBC-V | The Striped Legless Lizard occurs in the Southern Tablelands, the South West Slopes and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma and Tumut areas. Also occurs in the ACT, Victoria and south-eastern South Australia. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa* spp. and poa tussocks *Poa* spp., and occasionally wallaby grasses *Austrodanthonia* spp. Sometimes present in modified grasslands with a significant content of exotic grasses such as *Phalaris aquatica, Nasella trichotoma* and *Hypocharis radicata*. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter. Actively hunts for spiders, crickets, moth larvae and cockroaches. Two papery eggs are laid in early summer. Goes below ground or under rocks or logs over winter. Animals have been recorded moving at least 20m in one day, and up to 50m over several weeks. | Absent –<br>. | Unlikely | No |
| Pale-headed Snake<br>*Hoplocephalus bitorquatus*<br>TSC-V | A patchy distribution from north-east Queensland to north-east NSW. In NSW it occurs from the coast to the western side of the Great Divide as far south as Tuggerah. Found mainly in dry eucalypt forests and woodlands, cypress woodland and occasionally in rainforest or moist eucalypt forest. Favours streamside areas, particularly in drier habitats. Shelter during the day between loose bark and tree-trunks, or in hollow trunks and limbs of dead trees. The main prey is tree frogs although lizards and small mammals are also taken. | Absent | Unlikely | No |
| Little Whip Snake<br>*Suta flagellum*<br>TSC-V | The Little Whip Snake is found within an area bounded by Crookwell in the north, Bombala in the south, Tumbarumba to the west and Braidwood to the east. Occurs in Natural Temperate Grasslands and grassy woodlands, including those dominated by Snow Gum *Eucalyptus pauciflora* or Yellow Box *E. melliodora*. Also occurs in secondary grasslands derived from clearing of | Absent - Natural Temperate Grasslands and grassy woodlands are not present in the study area. | Unlikely | No |

| Species and Status | Description of habitat[2] | Presence of habitat | Likelihood of occurrence | Potential for impact? |
|---|---|---|---|---|
| | woodlands. Found on well drained hillsides, mostly associated with scattered loose rocks. Most specimens have been found under rocks or logs lying on, or partially embedded in the soil. Little is known about the habits of this small snake as it is primarily nocturnal. Feeds on lizards and frogs. Up to seven live young are born between September and February. | | | |
| Rosenberg's Goanna<br>*Varanus rosenbergi*<br>TSC-V | Rosenberg's Goanna occurs on the Sydney Sandstone in Wollemi National Park to the north-west of Sydney, in the Goulburn and ACT regions and near Cooma in the south. There are records from the South West Slopes near Khancoban and Tooma River. Also occurs in South Australia and Western Australia. Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Individuals require large areas of habitat. Feeds on carrion, birds, eggs, reptiles and small mammals. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens. Runs along the ground when pursued (as opposed to the Lace Monitor, which climbs trees). Lays up to 14 eggs in a termite mound; the hatchlings dig themselves out of the mounds. Generally slow moving; on the tablelands likely only to be seen on the hottest days. | Absent – Termite mounds not present in the study area. | Unlikely | No. |

E TSC = listed as Endangered under Schedule 1 of the NSW *Threatened Species Conservation Act 1995*

E EPBC = listed as Endangered under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

V TSC = listed as Vulnerable under Schedule 2 of the NSW *Threatened Species Conservation Act 1995.*

V EPBC = listed as Vulnerable under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

M EPBC = listed as Migratory under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

CE EPBC = listed as Critically Endangered under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

CAMBA = Chinese-Australia Migratory Bird Agreement

JAMBA = Japan-Australia Migratory Bird Agreement

# APPENDIX D BACKGROUND SEARCHES

# APPENDIX E ASSESSMENTS OF SIGNIFICANCE

## E.1 THREATENED SPECIES CONSERVATION ACT SEVEN-PART TEST

Section 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) specifies seven factors to be taken into account in deciding whether a development is likely to significantly affect threatened species, populations or ecological communities, or their habitats, listed at the state level under the *Threatened Species Conservation Act 1995*.

This *Seven-part Test* characterises the significance of likely impact associated with the proposal on the following species:

- Woodland Birds
    - Brown Treecreeper (eastern subspecies), *Climacteris picumnus victoriae*
    - Little Lorikeet, *Glossopsitta pusilla*
    - Hooded Robin (south-eastern form), *Melanodryas cucullata*
    - Turquoise Parrot, *Neophema pulchella*
    - Powerful Owl, *Ninox strenua*
    - Scarlet Robin, *Petroica boodang*
    - Flame Robin, *Petroica phoenicea*
    - Regent Parrot, *Polytelis anthopeplus monarchoides*
    - Superb Parrot, *Polytelis swainsonii*
    - Grey-crowned Babbler (eastern subspecies), *Pomatostomus temporalis*
    - Diamond Firetail, *Stagonopleura guttata*
- Microchiropteran Bats
    - Little Pied Bat, *Chalinolobus picatus*
    - Corben's Long-eared Bat, *Nyctophilus Corbeni*
    - Yellow-bellied Sheathtail-bat, *Saccolaimus flaviventris*
- Squirrel Glider, *Petaurus norfolcensis*

**a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**

**Woodland Birds**

The woodland bird species with the potential to occur in the study area generally require a range of woodland habitats for their life-cycle requirements. These habitats include woodland tree species, shrub species, grasses, fallen timber and leaf litter. In addition, some of these species require tree hollows for their breeding requirements.

The proposal site supports woodland habitat, including hollow-bearing trees. However, shrub species are generally absent from the proposal site. None of these species were recorded during the field surveys, although conditions were not ideal for detecting fauna species. It is considered that these species could occur on the proposal site from time to time, however the habitat present is small and likely to form part of larger home ranges.

The proposal would result in the removal of some habitats and resources from the proposal site, including several hollow-bearing trees and understorey vegetation. In addition, the proposal would result in increased human activity in the area, albeit only to a small extent.

Overall, the extent of impact on habitat is small and not likely to lead to a local viable population of any of these species becoming extinct.

**Microchiropteran Bats**

The microchiropteran bat species with the potential to occur in the proposal site rely on woodland habitats for their life-cycle requirements. This includes woodland vegetation for foraging for insects as well as tree hollows, bark and fissures for roosting.

The proposal site supports woodland habitat, including hollow-bearing trees. No targeted surveys for bat species were conducted during the field surveys, however it is considered that these species could occur on the proposal site from time to time. Notwithstanding this, the habitat present is small and likely to form part of larger home ranges.

The proposal would result in the removal of some habitats and resources from the proposal site, including several hollow-bearing trees. In addition, the proposal would result in increased human activity in the area, albeit only to a small extent.

Overall, the extent of impact on habitat is small and not likely to lead to a local viable population of any of these species becoming extinct.

**Squirrel Glider**

The Squirrel Glider inhabits dry sclerophyll forest and woodland including River Red Gum forests of the Murray Valley. The species requires abundant hollow-bearing trees and a mix of eucalypts, acacias and banksias. Home-ranges have been estimated at between 0.65 and 8.55ha.

The proposal site supports woodland habitat, including hollow-bearing trees. No targeted surveys for this species was conducted during the field surveys, however it is considered that it could occur on the proposal site from time to time. Notwithstanding this, the habitat present is small and likely to form part of larger home ranges.

The proposal would result in the removal of some habitats and resources from the proposal site, including several hollow-bearing trees. In addition, the proposal would result in increased human activity in the area, albeit only to a small extent.

Overall, the extent of impact on habitat is small and not likely to lead to a local viable population of this species becoming extinct.

**b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.**

**Not Applicable**

**c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:**

**i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

**ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.**

**Not Applicable**

**d) In relation to the habitat of a threatened species, population or ecological community:**

**i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

**ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

**iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

I. The proposal would remove a small amount of woodland habitat, including several trees and understorey grasses. Overall, the majority of the woodland habitat on the proposal site

would not be directly affected. The proposal would also remove several hollow-bearing trees from the proposal site. However, the site supports over 24 hollow-bearing trees, and the extent of removal of this resource is therefore considered small. Whilst indirect impacts such as vegetation maintenance and the introduction of exotic species is likely, the extent of this is small in relation to the habitat present both on the proposal site and in the study area.

II. The proposal would leave the majority of the overstorey vegetation intact. Fragmentation of this habitat would be minimal. The proposal would lead to some fragmentation of the understorey vegetation. However, the threatened species being assessed are all highly mobile and not dependent upon understorey vegetation for moving across the landscape. Overall this impact is considered small. Vegetation along the river would not be fragmented.

III. The habitat on the proposal site is significantly modified and subject to existing disturbances from human activity. It is not considered to be important to the survival of any threatened species.

**e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).**

There is currently no critical habitat listed for any of these species.

**f) Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.**

The proposal is unlikely to be inconsistent with any recovery plan, given the small scale of the potential impacts.

**g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Clearing of native vegetation – Works would involve the removal of native ground cover vegetation. The vegetation which would be removed is common and widespread. Potential habitat which would be removed is small in the context of the locality. Impacts to flora and fauna as a result of the works would be minor.

Removal of dead wood– Dead wood would be relocated as a result of the proposal where required. Considering the small size of the clearing area and the presence of intact extents of native vegetation adjacent to the proposal site the relocation of this small amount of dead wood is unlikely to increase the impact of this key threatening process.

### *E.1.1 Conclusion*

The proposal would have direct and indirect impacts to the habitat of threatened woodland birds and mammals. This Assessment of Significance has found that these impacts are unlikely to lead to a local population of any of these species becoming extinct, or modify habitat to the extent that it could place any of these species at risk of local extinction. A significant impact is not considered likely.

It is concluded that a Species Impact Statement is not required for any of these species.

## E.2 FISHERIES MANAGEMENT ACT 1994 SEVEN-PART TEST

Section 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) specifies seven factors to be taken into account in deciding whether a development is likely to significantly affect threatened species, populations or ecological communities, or their habitats, listed at the state level under the *Threatened Species Conservation Act 1995* and the *Fisheries Management Act 1994.*

This *Seven-part Test* characterises the significance of likely impact associated with the proposal on the following fauna species and ecological communities, listed under the *Fisheries Management Act 1994* (FM Act):

- The aquatic ecological community in the natural drainage system of the lower Murray River catchment - Endangered

**a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**

**Ecological Community (The aquatic ecological community in the natural drainage system of the lower Murray River catchment)**

Not Applicable

**b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.**

**Ecological Community (The aquatic ecological community in the natural drainage system of the lower Murray River catchment)**

Not Applicable

**c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:**

**i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

**ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.**

**Ecological Community (The aquatic ecological community in the natural drainage system of the lower Murray River catchment)**

i. The proposal involves the subdivision of land leading to the construction of road and residential infrastructure within defined building envelopes. No direct impact to aquatic habitats would occur. The indirect impacts are unlikely to reduce the extent of this community locally or in the broader study area. Given this, it is considered unlikely that the proposal would affect the community to the point that its local occurrence would be placed at risk of extinction.

ii. The proposal would not modify the composition of the ecological community. The work would require the removal of some River Red Gums, but no direct impact to the aquatic ecosystem would occur. The proposal is unlikely to affect any in-stream resources. The proposal is likely to result in some soil disturbance which could lead to the spread or introduction of additional exotic species; however it is considered unlikely that this would change the composition of the community to the point where

its local occurrence would be placed at risk of extinction.

**d) In relation to the habitat of a threatened species, population or ecological community:**

**i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

**ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**

**iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

**Ecological Community (The aquatic ecological community in the natural drainage system of the lower Murray River catchment)**

i. No direct impact to the habitat of this EEC would occur as a result of the proposal. Indirect impacts are unlikely to affect the extent of any habitat.

ii. No direct impact to the habitat of this EEC would occur as a result of the proposal. Indirect impacts are unlikely to fragment or isolate any part of this EEC.

iii. The Edward River is considered Key Fish Habitat by the NSW Department of Primary Industries (DPI Fisheries). This habitat is fundamental to the sustainability and maintenance of fish populations in general, and the survival and recovery of threatened species (DPI 2011). This habitat is unlikely to be impacted by the proposal. The proposal would not impact the long term survival of this community.

**e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).**

**Ecological Community (The aquatic ecological community in the natural drainage system of the lower Murray River catchment)**

No critical habitat had been established for this community at the time of writing

**f) Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.**

**Ecological Community (The aquatic ecological community in the natural drainage system of the lower Murray River catchment)**

Six recovery strategies have been identified by the NSW Department of Primary Industries:

- Remediate barriers to fish passage
- Protect and reinstate large woody debris
- Restore riparian vegetation
- Pest species eradication and control
- Advice to consent and determining authorities
- Recovery plan preparation.

The proposal would not be inconsistent with any of these recovery plans.

**g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

**Ecological Community (The aquatic ecological community in the natural drainage system of the lower Murray River catchment)**

The removal of large woody debris from New South Wales rivers and streams is considered a key threatening process (KTP) under the FM Act. The proposal would not result in any impact to instream

woody debris.

A further KTP under the FM Act is the Degradation of native riparian vegetation along New South Wales water courses. The proposal would result in the removal of some River Red Gum riparian habitat, as well as increased human activity within the River Red Gum area. These impacts would constitute part of this KTP. However, the extent of these impacts is very small and not likely to be a significant.

Predation by the Plague Minnow (*Gambusia holbrooki*) is also listed key threatening processes under the NSW TSC Act. It is not considered that the proposed action would promote or increase predation by Plague Minnow on fish species within this community.

### *E.2.1 CONCLUSION*

Based on the information outlined in the assessment of significance, the proposal is not anticipated to have a significant detrimental effect on the lower Murray endangered ecological community, and as such it is not considered that a species impact statement is required for the proposed activity.

## E.3 EPBC ACT ASSESSMENT OF SIGNIFICANCE

The *Environment Protection and Biodiversity Conservation Act* 1999 specifies factors to be taken into account in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level.

The below Vulnerable species have the potential to occur on the proposal site:

- Woodland Birds
  - Regent Parrot, *Polytelis anthopeplus monarchoides*
  - Superb Parrot, *Polytelis swainsonii*
- Microchiropteran Bats
  - Corben's Long-eared Bat, *Nyctophilus Corbeni*

Different significant impact criteria apply depending on the level at which a species or community is listed (i.e. vulnerable, endangered, critically endangered etc.). The appropriate criteria have been applied to the entities listed above.

Detailed information for each entity has been provided in the TSC Act Assessments of Significance. The EPBC Act assessments below do not repeat this information and instead summarise this where appropriate. As such, the assessments below should be read in conjunction with the TSC Act Assessments of Significance.

In the context of the assessments below, 'the action' refers to 'the proposal' as described in this report.

**An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:**

**a) Lead to a long-term decrease in the size of an important population of a species?**

An 'important population' is defined as a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- Key source populations either for breeding or dispersal
- Populations that are necessary for maintaining genetic diversity, and/or
- Populations that are near the limit of the species range.

It is not known if a population of any of these species is present at the site. From the habitat assessment the small area of habitat to be removed is unlikely to cause a long-term decrease in the size of any population. As such, an important population is not considered to occur or be at risk of impact from the proposal.

**b) Reduce the area of occupancy of an important population?**

The proposal area is unlikely to support an important population of any of these species due to the already fragmented state of the community.

**c) Fragment an existing important population into two or more populations?**

The proposal area is unlikely to support an important population of any of these species due to the already fragmented state of the community.

**d) Adversely affect habitat critical to the survival of a species?**

No critical habitat is listed as occurring in the study area. Only several hollow-bearing trees would be removed from the proposal site and it is unlikely this will result in the loss of significant roosting and breading sites.

**e) Disrupt the breeding cycle of an important population?**

The proposal area is unlikely to support an important population of any of these species due to the already fragmented state of the community.

**f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?**

In the context of the extensive areas of similar habitat in the locality, the small area of habitat affected by the proposal is not likely to result in the decline of any of these species.

**g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?**

The proposal would increase human activity in the proposal site, which could lead to the introduction of exotic species (eg landscaping and gardens). Given the mobility of these species, however, this is unlikely to be harmful to them. Similarly, exotic fauna such as cats and dogs may be introduced into the proposal site. These animals could predate threatened bird species. Given the very small scale of the proposal, this is unlikely to significantly affect these species.

**h) Introduce disease that may cause the species to decline, or**

The proposal is unlikely to introduce disease that would affect the species.

**i) Interfere substantially with the recovery of the species?**

The amount of habitat to be cleared by the proposal is considered to be minor in the context of the extensive areas of similar habitat in the locality. The proposal would not significantly affect the existing connectivity for these species. The proposal would be unlikely to substantially interfere with the recovery of any of these species.

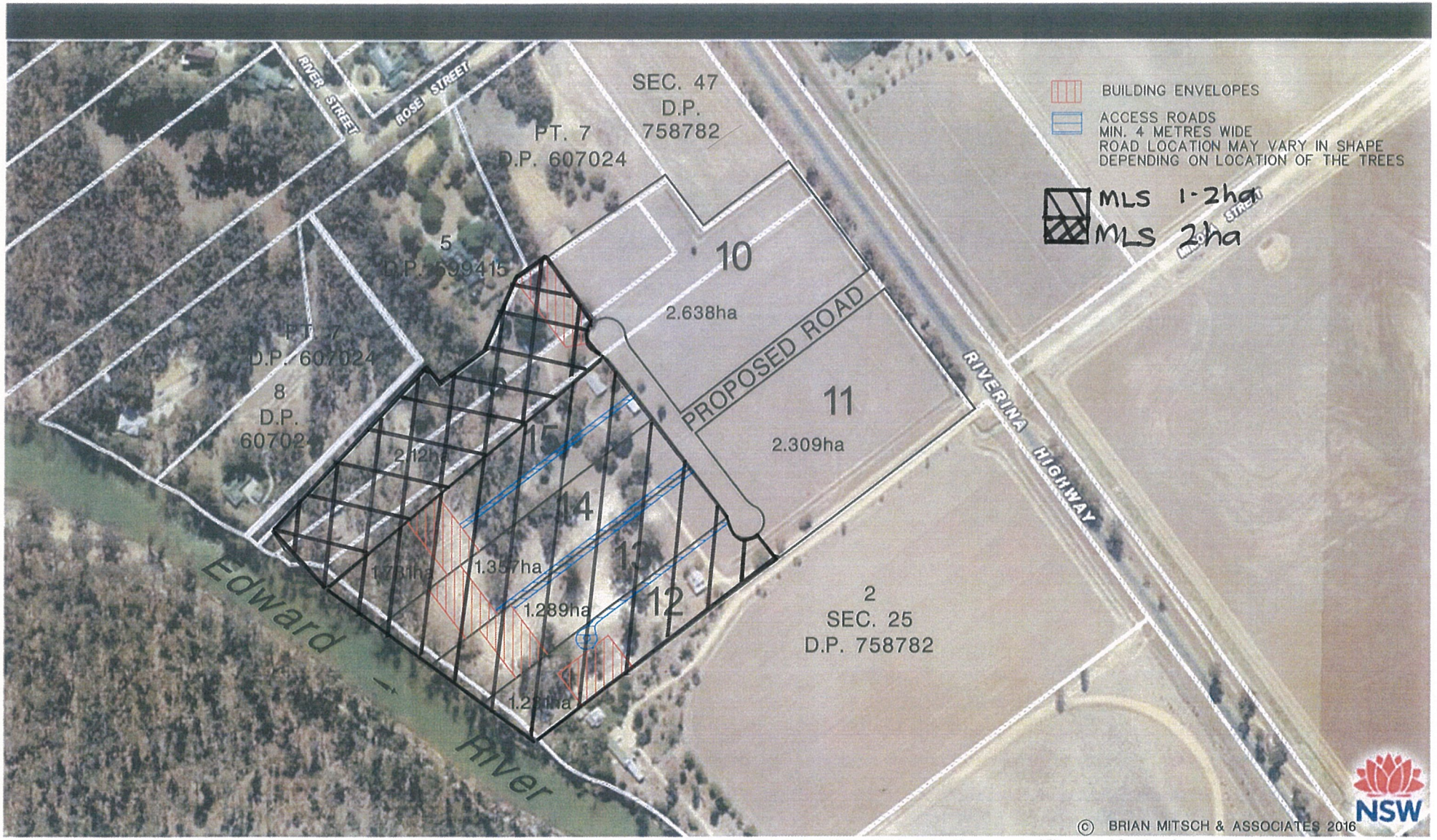
**Conclusion**

The proposal area does not support a known population of any of these species, nor an important population.

The reduction in available habitat is not considered to significant affect any of these species. A significant impact is unlikely and referral to the Commonwealth is not considered necessary.

# Appendix 10

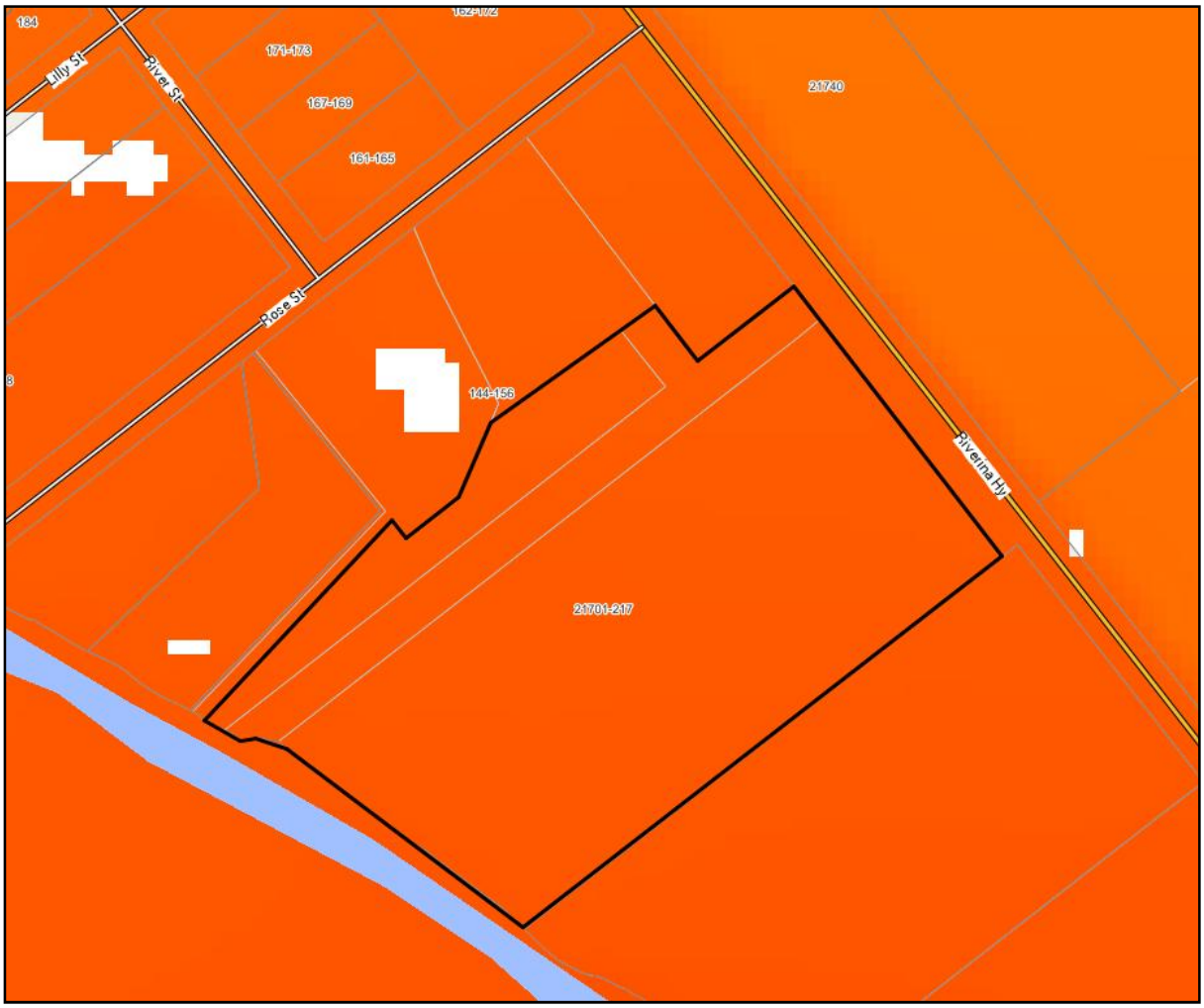
**Minimum Lot Size**



# Appendix 11

**Flood Planning Area**

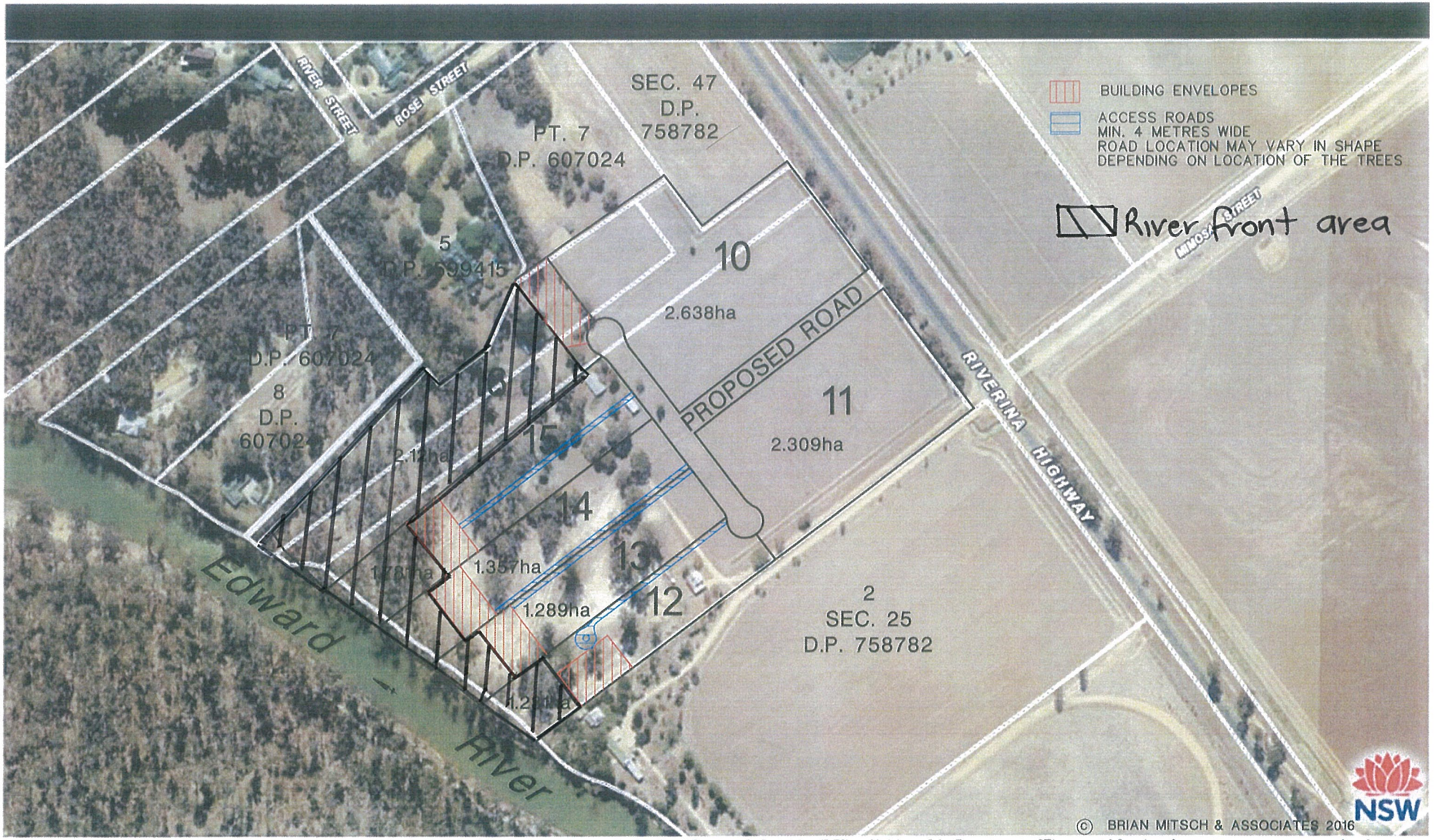
## Flood Planning Area




**Flood planning area for subject site**
**Source: Edward River at Deniliquin Flood Study (2014)**

# Appendix 12

**River Front Area**



# Appendix 13

**State Environmental Planning Policies**

## CONSISTENCY WITH STATE ENVIRONMENTAL PLANNING POLICIES

The following SEPPs apply to land that the Deniliquin LEP 2013 applies to.

**SEPP 21 Caravan Parks** **Not applicable**
This SEPP applies to the Edward River Council but the planning proposal relates to a change of zone and will not impact on provisions relating to caravan parks.

**SEPP 30 Intensive Agriculture** **Not applicable**
The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP 33 Hazardous and Offensive Development** **Not applicable**
The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP 36 Manufactured Home Estates** **Not applicable**
The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP 50 Canal Estate Development** **Not applicable**
The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP 52 Farm Dams and Other Works in Land and Water Management Plan Areas** **Not applicable**
The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP 55 Remediation of Land** **Applicable**
Council is required to consider SEPP55 when preparing a planning proposal and in particular clause 6.

Aerial photography from 2008 shows that part of the site has been used for agriculture. Figure 2 is an extract from this photography showing the subject site and the bays used for cropping.

Table 1 of the 'Managing Land Contamination Planning Guidelines' (Department of Urban Affairs and Planning/Environment Protection Authority, 1998) lists agricultural activities as a potentially contaminating land use.

A detailed site investigation would be required for part of the site as part of any development application submission.

**SEPP 62 Sustainable Aquaculture** **Not applicable**
The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP 64 Advertising and Signage** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP 65 Design Quality of Residential Apartment Development** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP Affordable Rental Housing (2009)** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP Building Sustainability Index: BASIX (2004)** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP Exempt and Complying Development Codes (2008)** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP Housings for Seniors or People with a Disability** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP Infrastructure (2007)** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP Integration and Repeals (2016)** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP Mining, Petroleum Production and Extractive Industries (2007)** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP Miscellaneous Consent Provisions (2007)** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.

**SEPP Rural Lands (2008)** **Not applicable**

The rural planning principles have been considered as part of consideration of the Section 117 Directions.

**SEPP State and Regional Development (2011)** **Not applicable**

The planning proposal does not contain any local provisions that are in conflict with the provisions of this SEPP.