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Ellerton Drive Extension

Part 5 Review of Environmental Factors Determination Report

June 2016

Ellerton Drive Extension - Determination Report

Client: Queanbeyan City Council

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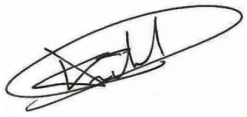
1-0	20-Nov-2015	For Issue	Guillaume Prudent-Richard Associate Director	
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1.0 Introduction

The Queanbeyan City Council (QCC) in partnership with the Australian and NSW Governments proposes to construct a new two lane single carriageway, sealed road as an extension to Ellerton Drive at East Queanbeyan to Old Cooma Road and Edwin Land Parkway at Karabar, in Queanbeyan, NSW (the Proposal). QCC is the proponent and determining authority for this project.

A Review of Environmental Factors (REF) was prepared by SMEC (2015) and revised in April 2016 (Appendix A) to assess the potential environmental impacts of the Proposal. The REF was revised to include a review of a Species Impact Statement Addendum (Addendum 2, ngh Environmental, 2016) (Appendix B), a Social Impact Assessment (RM Planning, 2016) (Appendix C), a Squirrel Glider Survey (ARCUE, 2016) (Appendix D), updated Noise Report (SLR, 2016) (Appendix E) and the Submissions Report (QCC, 2016) (Appendix F). AECOM have been engaged by QCC to review the revised REF, and to prepare a revised Determination Report with recommendations for Council's consideration.

The proposed Ellerton Drive Extension (EDE) has been developed in response to the need to cater for future growth in Queanbeyan, predominantly as a result of increased residential development in southern Queanbeyan. The Strategic Business Case (Roads and Maritime Services, 2014) identifies that the Proposal would improve travel times, travel experience and the city's liveability. The proposal is also expected to improve regional connectivity to jobs and services, improve road safety and sustainability though reduced road congestion in Queanbeyan's CBD, and provide increased flood protection.

1.1 Purpose of the Report

Through an independent review of the REF and associated documentation, this Determination Report:

- **Assesses whether the REF sufficiently addresses relevant legislative requirements (as described in Section 1.2 of this report).**
- **Considers how adequately the REF addresses appropriate matters to ensure that potential impacts and safeguard measures have been included (Section 5.0).**
- **Considers the likely significance of the impacts of the Proposal in accordance with section 111 and 112 of the *Environmental Planning and Assessment Act 1979 (*EP&A Act) and the best practice guidelines *Is an EIS Required* (Section 6.0)?**
- **Recommends whether an EIS under Part 5 of the EP&A Act is or is not required (Section 6.0).**
- **Confirms whether the results of community and stakeholder consultation have been properly included and considered in the REF or the Submissions Report (Section 4.0).**
- **Recommends whether QCC should proceed with the Proposal (Section 7.0).**
- **Recommends conditions of approval, including mitigation measures to be incorporated in Construction/Operational Environmental Management Plan documentation to minimise potential environmental impacts (Section 6.0).**

1.2 Planning framework

1.2.1 The need for an REF

The EP&A Act and *the Environmental Planning and Assessment Regulation 2000* (EPAR) provide the statutory context for the Proposal's environmental assessment and approval.

The Proposal falls under Part 5 of the EP&A Act, as it satisfies the definition for a 'public road' as specified under clause 93 of the *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP). Proposals under this definition do not require development consent and therefore are assessed under Part 5 of the EP&A Act by a determining authority. The purpose of Part 5 is to ensure that factors relating to the environment and threatened species are considered when making decisions about activities, Section 111 of the EP&A Act places a duty on all determining authorities to 'take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity'. This includes considering the effect of the Proposal on:

- **Any conservation agreement entered into under the *National Parks and Wildlife Act 1974* (NPW Act) and any associated plan of management**
- **Any joint management agreement enter into under the *Threatened Species Conservation Act 1995* (TSC Act)**
- **Any biobanking agreement entered into under Part 7A of the TSC Act**
- **Critical habitat**
- **Threatened species, populations and ecological communities, and their habitats, where there is likely to be a significant effect on those species, populations or ecological communities, or those habitats**
- **Any other protected fauna or protected native plants within the meaning of the NPW Act.**

Clause 228 of the EPAR identifies the factors which must be taken into account when determining authorities are considering what is the likely impact of an activity of the environment. These include:

- **Any environmental impact on a community**
- **Any transformation of a locality**
- **Any environmental impact on the ecosystems of the locality**
- **Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality**
- **Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations**
- **Any impact on the habitat of protected fauna (within the meaning of the NPW Act 1974)**
- **Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air**
- **Any long-term effects on the environment**
- **Any degradation of the quality of the environment**
- **Any risk to the safety of the environment**
- **Any reduction in the range of beneficial uses of the environment**
- **Any pollution of the environment**
- **Any environmental problems associated with the disposal of waste**
- **Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply**
- **Any cumulative environmental effect with other existing or likely future activities**
- **Any impact on coastal processes and coastal hazards, including those under projected climate change conditions.**

The REF prepared by SMEC (2016) provides assessment of the above factors.

Under Part 5 of the EP&A Act, the determining authority must also decide if an environmental impact statement (EIS) is required. As stated in section 112(1) an EIS is required if the proposal is 'likely to significantly affect the environment. This report identifies that an EIS is not required in Section 6.0.

1.2.2 The need for a Species Impact Statement

Species Impact Statements (SISs) are employed to assess the significance of the effect of actions on threatened species, populations and ecological communities, or their habitats. Under Part 5 of the EP&A Act, an SIS is required for activities that are likely to significantly affect the environment including critical habitat, threatened species, populations and ecological communities or their habitats. The need for an SIS for the Proposal was confirmed through seven-part tests which enabled an assessment of whether a significant impact is likely to occur for any listed threatened species or endangered ecological communities listed under the TSC Act. The form and content of an SIS must meet the requirements under section 109 and110 of the TSC Act, and comply with the requirements issued by the Director-General of National Parks and Wildlife.

1.2.3 Concurrence

Under section 112C of the EP&A Act, a determining authority must not carry out, or grant an approval to carry out an activity 'that is likely to significantly affect a threatened species, population or ecology community or its habitat without the concurrence from the Chief Executive of the Office of Environment and Heritage (OEH). The Chief Executive may either grant concurrence to the development, either unconditionally or subject to conditions, or refuse concurrence to the development (as specified in section 79B (8) of the EP&A Act. If QCC does not determine to approve the Proposal, concurrence does not need to be sought.

1.2.4 Commonwealth matters

The Proposal has been determined to be a controlled action under the *Environment Protection and Biodiversity and Conservation Act 1999* (EPBC Act). As such, assessment and a decision about whether approval should be given under the EPBC Act is required. The Commonwealth Department of Environment has requested that documentation be provided to assist in making the decision, including details of proposed offset areas to address residual impacts of the Proposal on Hoary Sunray and White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland. The Proposal cannot commence until such time as an approval is granted under the EPBC Act.

2.0 Summary of the Proposal

The Proposal is for the construction and operation of a new two lane single carriageway, sealed road as an extension to Ellerton Drive at East Queanbeyan to Old Cooma Road and Edwin Land Parkway at Karabar, in Queanbeyan NSW. The Proposal consists of one travel lane in each direction with climbing lanes in areas with steep grades. The Proposal originally included dual carriageway bridges crossing Queanbeyan River and Barracks Flat Drive, but this has been reduced to a single bridge. The Proposal incorporates the construction of supporting infrastructure including shared paths, lighting, stormwater drains, fauna under-passes, stockpile areas and noise walls. The footprint has been increased to include connecting works and intersections of existing roads.

The alignment of the Proposal runs between northeast Queanbeyan and southern Queanbeyan, along the eastern urban fringe. The overall length of the Proposal is 4.6 km and the total development footprint is approximately 49 ha. Of the overall length, 3.86 km is new construction in greenfield sites and the balance of the length consists of upgrades to existing Ellerton Drive. The development footprint comprises patches of shrubland, grassland, dry forest and woodland including the endangered ecological community of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland as listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) (Endangered Ecological Community) and 5.99 ha Commonwealth EPBC Act (Critically Endangered Ecological Community). The development footprint also comprises 0.2 ha riverine habitat where the Proposal crosses the Queanbeyan River.

3.0 Justification of the proposal

QCC projections show that Queanbeyan's population is predicted to increase by approximately 15,000 by 2031, with increases expected to mostly occur in the Googong and Tralee development areas in southern Queanbeyan. In 2010 traffic modelling was undertaken to identify network improvement works needed to address deficiencies in the future Queanbeyan road network as a result of this growth (Gabites Porter, 2010). The maintenance of a suitable level of road network performance is considered vital to ensure the continued safe and efficient movement of people and goods throughout Queanbeyan. The current Queanbeyan road network is identified as operating at Level of Service (LOS) D or better.

The 'do nothing' approach, which would result in maintaining and managing the current road network and not constructing new roads or upgrading existing roads and intersections, would not provide the necessary transport infrastructure to accommodate the future transport demands of Queanbeyan and the region, anticipated to exceed the capacity of the current network. Currently approved and potential land use development is expected to increase travel demand and traffic volumes, particularly along Bungendore Road through the main street of Queanbeyan CBD. This would lead to increased congestion, increased crash risk, and reduced amenity. Further traffic congestion and delays in the regional transport corridor could ultimately restrict the growth potential of the Queanbeyan area.

The REF summarises the risks associated with the current road network remaining unchanged:

- **Lack of connectivity between the land releases, the Queanbeyan CBD and the ACT, leading to network congestion and a lack of access to employment areas**
- **Increased traffic congestion and road safety risks through the Queanbeyan main street precinct (especially for pedestrians)**
- **Need for junction upgrades on Kings Highway (Queanbeyan main street) and Old Cooma Road**
- **Reduced amenity for residents and road users in and around the CBD and new development areas**
- **Reduction of land release potential**
- **Increased traffic congestion and loss of amenity for residents along Cooma Street**
- **Increased traffic congestion and road safety risks adjacent to three schools in the Queanbeyan CBD area.**

A 2010 traffic study proposed a number of road options to address possible network deficiencies as a result of anticipated developments and population increase. These options included road and intersection upgrades as well as several new routes as a means of creating additional capacity, thereby relieving areas of congestion. Traffic modelling concluded that the Proposal provided the greatest economic benefit and served the required safety and development and social sustainability objectives. The modelling identified that by 2017, without the Proposal, the Kings Highway (also known as Bungendore Road) route through Queanbeyan's CBD which includes the crossing of Queanbeyan River over Queens Bridge, would be performing at LOS F. LOS F equates to forced flow, stop-start conditions with traffic volumes exceeding capacity during the am peak hour. The Proposal is projected to reduce 2017 traffic volumes through the CBD by 15%. As part of the Proposal, the proposed new bridge over Queanbeyan River would maintain a connection between the east and west of Queanbeyan in the event of a 1 in 100 year flood event that would place the CBD underwater.

In 2014 QCC commissioned a further traffic study using the most recent census data and growth forecasts for both Queanbeyan and Canberra (TDG, 2014). The study reinforced the 2010 modelling results.

The Proposal is aligned with other town strategic objectives by:

- **Improving the quality of service through improved travel times, improved customer travel experience, improved customer options**
- **Improving liveability through facilitating ease of movement to activity centres**
- **Supporting regional development through improved connectivity to jobs and services**
- **Improving safety and security through improved road safety**
- **Improving social sustainability through reduced road congestion.**

4.0 Consultation and Assessment of Submissions

The original REF (SMEC, 2015) was placed on public exhibition for an extended period of 60 days from 12 December 2014 to 9 February 2015. The following documents were exhibited online (http://www.qcc.nsw.gov.au/Ellerton-Drive-Extension/EDE) and at two locations (Queanbeyan City Council's Customer Service Centre and Queanbeyan Library):

- Review of Environmental Factors (REF)
- Draft Species Impact Statement (SIS)
- Preliminary road designs
- Heritage report - Aboriginal Cultural Heritage Archaeological Report (ACHAR).

In addition a public meeting (Community Forum) was held on 28 April 2015.

A total of 357 formal submissions were received in response to the public exhibition of the REF; this included the formal submissions and responses to feedback forms. Of the 357 submissions and feedback forms, 188 responses were in support for the Proposal, 140 against, and 29 other opinions. In addition, over 150 written questions along with some presentations prepared by community members were lodged prior to and after the Community Forum. The responses to these questions and submissions can be found in the Final Submissions Report (Appendix F).

The key issues raised were:

- The project is well overdue, and will improve traffic congestion in Queanbeyan
- Concerns regarding the cost of the project to the current community (Queanbeyan rate payers) and future generations
- Traffic noise generated in a rural setting, and the inadequacy of mitigation measures
- Lack of consideration of alternative routes
- Lack of benefits from the Proposal, and where funding could be better spent
- The adequacy of the consultation process
- General amenity impacts.

A second Addendum to the SIS, addressing changes to the Proposal area, was prepared by ngh Environmental and placed on public exhibition from 4 March 2016 to 3 April 2016. The document was exhibited online (www.qcc.nsw.gov.au) and at the Queanbeyan City Council's Customer Service Centre. The Noise and Vibration Assessment was updated in April 2016 (SLR, 2016) to include an assessment of the effectiveness of the proposed noise mitigation measures (noise walls). The REF was amended to include the update noise assessment results and to update the project footprint as per the amended design in March 2016.

Consultation will continue as the detailed design progresses and would include:

- Residents
- Businesses
- Local community members.

5.0 Review of the REF

This section summarises the findings of the REF and associated investigations, with commentary on the adequacy of the REF in relation to the items listed in Section 1.1, where relevant.

5.1 Noise and Vibration

The REF provides a summary of a quantitative noise and vibration assessment undertaken for the Proposal by SLR Consulting Australia Pty Ltd. SLR's assessment involved a number of components and iterations.

The noise investigations undertaken by SLR involved noise monitoring to characterise existing ambient noise levels upon which to base noise emission targets, and noise modelling during construction and operation phases of the Proposal. The assessment was undertaken for a number of noise catchment areas (NCAs) identified across the Proposal area. The NCAs were chosen to capture sensitive receivers which would potentially be affected by noise generated by the Proposal. The noise assessment adopts the NSW Government's *Road Noise Policy* (RNP) (DECC, 2011) for operational noise, and the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) for construction noise.

An initial noise impact assessment was placed on public exhibition from 12 December 2014 to 9 February 2015 (report dated 9 December 2014). Several issues were raised with respect to the report and these were corrected in an updated version of the report issued in February 2015. Following noise information sessions with affected residents, site investigations were undertaken by SLR on properties where predicted noise levels exceeded the adopted assessment criteria, in order to investigate potential noise mitigation treatments (inspection report dated 27 March 2015, appended to the Submissions Report). A follow-up study was also undertaken to investigate further possible mitigation options raised at the noise information sessions, and in the SLR report. The findings of this follow-up study were reported in a memorandum dated 30 March 2015, appended to the Submissions Report.

During operation, the investigations by SLR have found that unmitigated, the Proposal would result in exceedances of relevant RNP criteria for receivers across all NCAs. Such exceedances would be experienced at the majority of receivers within most NCAs. As stated in the Submissions Report, Council has undertaken to comply with the RNP in accordance with the RNP's 'reasonable and feasible' approach. Noise management options under consideration to achieve this have been provided in Table 13 and Table17 of the REF. A final Noise and Vibration Assessment completed in April 2016 (SLR, 2016) reviewed the effectiveness of the noise mitigation measures (noise wall) and found noise levels at 39 properties still exceeded the RNP guideline noise limits. Commitments have been given by QCC in the latest Submissions Report to further consult with affected individual homeowners to determine any additional reasonable and feasible noise mitigation measures, including potential at-property acoustic treatments. The combination of safeguards proposed to manage noise impacts are considered satisfactory, subject to effective implementation, and post implementation monitoring to enable verification of expected noise mitigation outcomes.

To assess the impact of construction noise, SLR modelled a worst-case construction scenario with all likely construction equipment operating simultaneously. The assessment was undertaken in accordance with the ICNG. As reported in the REF, the assessment found that a worst-case exceedance of the daytime noise goal of up to 32 dB(A) is predicted at the most affected sensitive receiver locations. The REF concludes that while this level of temporary exceedance is common for these types of construction activities, mitigation measures should be adopted to minimise the impact on receivers. No receivers were found to be Highly Noise Affected (construction noise >75 dB(A)).

Mitigation measures for construction noise proposed in the REF include the preparation of a site specific Construction Noise and Vibration Management Plan (CNVMP) which would identify the appropriate mitigation and management measures, consistent with the requirements of the ICNG. Mitigation measures relating to noise attenuation are also recommended in the SIA (RM Planning, 2016). This is considered sufficient mitigation for construction noise, and should encapsulate the standard suite of construction mitigation measures and the specific recommended measures outlined in the REF.

The noise and vibration assessment presents Proposal-specific vibration criteria, however there is no assessment or prediction of expected vibration impacts. The REF states that mitigation for construction vibration will be addressed in the CNVMP. In response to concerns raised relating to vibration impacts, the Submissions Report states that the SLR noise impact assessment assessed vibrations relating to both the construction and operation of the Proposal. The Submissions Report further states that all vibration criteria will not be exceeded during construction of the road due to the separation distances between vibration generating plant and sensitive receptors.

The Submissions Report states that prior to construction, Council will ensure that dilapidation surveys are undertaken of all buildings potentially subject to construction vibration effects. Clarifications in relation to the assessment of vibration in the revised Noise and Vibration assessment (2016, Appendix E) state that "vibration thresholds will not be expected to be exceeded during construction" based on "typical construction practices and past experience". The completion of dilapidation surveys, and the implementation of a project specific CNVMP, with appropriate complaints and corrective action mechanism is expected to adequately address the potential for adverse impacts from construction related vibration.

5.2 Traffic and Access

As the Proposal is a transport project, the discussion of traffic and access within the REF is focussed on the justification of the Proposal and other options considered. The justification is supported by traffic studies undertaken in 2010 (Gabites Porter, 2010), and 2014 (TDG, 2014) (see Section 3.0). The Proposal would have a beneficial impact on the network, maintaining an overall LOS at D or better, consistent with long standing objectives of QCC. The REF states that to ensure the Proposal functions as required, the upgrade of roundabouts to traffic signals at Lanyon Drive / Tompsitt Drive and Yass Road / Bungendore Road / Ellerton Drive would likely be required. These upgrades are currently under consideration as separate projects by RMS. As noted in the REF, QCC is also working on a range of other intersection and road upgrades, the majority of which would be required regardless of the construction of the Proposal.

In terms of impacts to traffic and access during construction, the REF has identified limited disruptions to local traffic flows. Proposed mitigation for this includes a detailed Traffic Management Plan for each of the construction phases for RMS to review and QCC to approve. This is considered to be sufficient to manage impacts to traffic during construction.

It is noted that many of the submissions received in favour of the Proposal referenced traffic reasons as the grounds for support.

5.3 Property, land use and socio-economic considerations

The REF provides a qualitative consideration of potential impacts on socio-economic aspects based on the Social Impact Assessment (RM Planning, 2016). The discussion highlights the positive impacts on the city of Queanbeyan as a whole and most local and regional residents due the improvement in the movement of people and goods and the removal of heavy traffic from the CBD and resultant improvement in the amenity and safety. The increased amenity is anticipated to have a positive impact for businesses by making the CBD more accessible and enjoyable. The discussion in the REF also acknowledges the potential negative impacts on some residents during operation due to changes in noise, access and visual and environmental amenity. The REF states that the most significant negative impact would be an increase in noise levels for adjacent and nearby residents.

The impacts on socio-economic aspects during construction are also discussed in the REF. The REF notes that some temporary negative impacts may be felt by some business and schools, due to a perceived or actual reduction in access and convenience. Temporary negative impacts on residents adjacent to the Proposal are also noted.

While the REF does not present a detailed quantitative assessment on socio-economic impacts, it is evident that a significant amount of planning and consideration of socio-economic matters has led to the development of the Proposal and its justification. Measures to mitigate potential negative impacts to socio-economic impacts have been provided throughout the REF where appropriate (e.g. within the sections dealing with noise, air quality etc.).

5.4 Biodiversity

The consideration of impacts to biodiversity in the REF is predominantly based on the findings of the SIS (2014) and associated addenda (2015 and 2016) which were prepared by ngh Environmental. The SIS and addenda were prepared to assess the impacts of the Proposal on threatened species, populations and communities listed under the TSC Act, however they also assesses impacts to threatened species and communities listed under the Commonwealth EPBC Act.

The Proposal is expected to have a significant impact on White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, Rosenberg's Goanna and the Speckled Warbler. As such concurrence from the Chief Executive of the Office of Environment and Heritage is required, before a determination on the Proposal can be made (s112C EP&A Act).

For the above listed and other threatened species and communities impacts have been calculated and presented in Section 3 of the SIS Addendum 2 and Section 6.4 of the REF.

In response to possible but unconfirmed sightings of Squirrel Gliders within the vicinity of the Proposal, Office of Environment and Heritage (OEH) requested additional targeted surveys for the species (ARCUE, 2016). Despite substantial survey effort that involved trapping, stagwatching and spotlighting, the species was not positively identified, and as such no impacts are expected to the species.

Specific safeguards have been proposed in the SIS and SIS Addendums and are included in Section 6.4 of the REF. Many of these need to be implemented prior to or in the early stages of the construction.

Although a number of site specific mitigations have been prepared to address identified potential impacts, including, for example, the inclusion of fauna underpass structures and fauna proof fencing, substantial residual impacts are still expected as a result of the Proposal. For this reason QCC has committed to implementing a Biodiversity Offset package for the Proposal, that deals with both NSW and Commonwealth matters impacted by the Proposal. Subject to the successful implementation of mitigation measures and offset strategy, the overall outcome from a biodiversity perspective is considered satisfactory.

5.5 Visual and Landscape Character

The REF provides a qualitative discussion on visual impacts during construction, and a summary of a visual impact assessment (VIA) undertaken for the operation phase of the Proposal (Sides Collective, 2014). The road alignment was adjusted to minimise environmental impact (vegetation removal) and visual impact following community consultation. Construction impacts are deemed 'minor' notwithstanding the proximity of proposed works to adjacent residences and the duration of the proposed works.

In terms of the visual impact of the operation phase of the Proposal, the VIA assesses eight locations along the proposed alignment. With the design and location of noise mitigation measures yet to be finalised, the assessment incorporates noise mitigation measures based on typical installations of representative dimensions. Visual impact ratings range from low adverse to high adverse, with most ratings being moderate. The REF states that when the noise wall designs are complete, the VIA will be updated, however this is unlikely to alter the REF conclusions. The REF additionally states that adjoining residents should be made aware of the likely final impacts and reasonable mitigation efforts should be afforded them. In some respects, the approach of predicting the noise mitigation installations in the VIA is an incomplete assessment given that designs are not yet finalised. It is however considered representative of the impacts likely to be experienced, and the updated VIA, review of mitigation measures, and informing of adjoining residents, is considered to be an adequate approach to manage the expected visual impacts resulting from the Proposal.

In addition, the REF does not provide a landscaping plan, therefore there is no certainty of the effectiveness of the landscaping in mitigating visual impacts. For this reason an additional recommendation has been included to develop this plan prior to the commencement of construction.

5.6 Lighting

The REF summarises the outcomes of a qualitative lighting assessment undertaken by SLR (2015). The REF states that the existing street lighting along Ellerton Drive and the intersections of the Proposal and Old Cooma Road will be upgraded to meet lighting regulations. New street lighting is also proposed at the intersections at 74 Barracks Flat Road and the future Jumping Creek Estate. Although not explicitly clear, the REF indicates that apart from these intersections, there would not be any other street lighting along the Proposal, including over the new Queanbeyan River Bridge. As a result, the REF concludes that light spill would be relatively localised, and would be further minimised with downward directional lighting. The REF states that the proposed lighting would be modelled and the light levels on potentially affected residences would be calculated during the detailed design phase. In terms of lighting impacts during construction, the potential use of security lighting and temporary lighting during construction for works outside standard hours is noted. However impacts would likely be minor and temporary in nature.

5.7 Geology, Soils and Water

The REF provides a very high level analysis of the existing environment and potential impacts from the Proposal with respect to geology, groundwater, surface water and soil. Existing conditions are largely based on geotechnical investigations undertaken by Coffey in 2014.

Potential impacts identified in the REF relate to the erosion of exposed soils during construction, and the pollution of Queanbeyan River due to sediment runoff, rubbish, oil, fuel or any other spilled hazardous material during construction and operation. Safeguards and management measures to mitigate these impacts are detailed in the REF and are considered sufficient for the identified impacts.

5.8 Air Quality

The assessment of the existing air quality environment and potential impacts from the Proposal is high level and qualitative in the REF, with no air quality monitoring or modelling undertaken. The existing air quality in the proposal area is documented as high in the REF, due to the undeveloped nature of the area with low level of industry. It has been identified therefore, that the operation of the proposal could result in increased air pollution from vehicle use of the corridor, increasing over time. The REF notes however, that the proposal would result in operational efficiencies through reduced congestion and improved flow in Queanbeyan, resulting in some reduction to vehicle emissions from a decline in start/stop motoring, particularly in the Queanbeyan CBD. It is considered that the net effect to the overall emissions profile for the network remains unknown without any quantitative assessment. This is further discussed in Section 5.10.

The REF identifies that construction-related air quality impacts are associated with the Proposal in the form of vehicle exhaust emissions and dust generation primarily due to earthworks, processing of excavated material and vegetation clearance.

To mitigate the construction-related air quality impacts, a number of safeguards and management measures are proposed in the REF. These safeguards, as well as the general high level and qualitative nature of the air quality assessment, is considered acceptable for the Proposal.

5.9 Heritage

The REF provides a brief summary of the findings of an archaeological assessment for the proposed EDE site in 2012 (CHMA, 2012), undertaken to determine the impact of the Proposal on non-Aboriginal and Aboriginal heritage items. It is not clear whether the assessment has been updated to include the altered footprint.

5.9.1 Non-Aboriginal Heritage

No historical sites were identified within the Proposal alignment through desktop searches or a site investigation. Two historical sites identified in the broader area were considered well outside the Proposal site. The REF therefore concluded that it is not expected that the Proposal would have any direct or indirect impacts on listed Non-Aboriginal heritage items. Notwithstanding, the REF noted the potential for unknown historical heritage sites to occur within the Jumping Creek section of the Proposal alignment. The proposed implementation of an Unexpected Archaeological Finds Procedure as a safeguard measure is considered sufficient to manage any unanticipated discoveries.

5.9.2 Aboriginal Heritage

Desktop searches and background literature identified eight aboriginal sites within 100 m of the Proposal route, and a further 60 were identified in through review of background literature. None of the identified sites within the alignment were found to be listed for indigenous values under the *Heritage Act 1977, Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, EPBC Act or the *Australian Heritage Council Act 2003*. All the sites identified within the alignment are protected under the *National Parks and Wildlife Act 1974* (NPW Act). During a field survey with Aboriginal representatives, a further six sites were identified. All sites identified range between 1 m and 88 m from the centreline of the proposed road corridor. As such the archaeological assessment stated that the sites identified may be subject to varying levels of harm. The assessment recommended that QCC obtain from OEH a s90 Aboriginal Heritage Impact Permit (AHIP) under the NPW Act in consultation with registered Aboriginal parties. It was recommended that the AHIP include the salvage of artefacts that might be subject to impacts. The management measures proposed in the archaeological assessment were circulated to all registered Aboriginal community groups and responses received were incorporated into the archaeological report. Following a further opportunity to comment on the proposed measures, no more comments were received.

In addition to the AHIP, measures proposed in the REF to minimise the impact on Aboriginal heritage include the inclusion of cultural awareness into site inductions, and the Unexpected Archaeological Finds Procedure. The Aboriginal Cultural Heritage Archaeological Report (Cultural Heritage Management Australia, 2014) must be updated to include the altered footprint so that a correct assessment is submitted for the s90 Aboriginal Heritage Impact Permit from the OEH. All mitigation measures proposed are considered sufficient to manage impacts to Aboriginal heritage.

5.10 Climate Change and Greenhouse Gases

The REF provides a high level assessment of climate change projections and potential climate change impacts of the Proposal. The data source for the climate projections in the REF is not provided, therefore the projections and their validity cannot be verified. The REF states that the potential impacts of climate change on the Proposal has been managed by adapting design standards considered necessary to reduce the vulnerability of infrastructure to predicted effects. This is evident through the bridge height which is designed to ensure safe passage for up to a 1 in 2,000 year flood event, however there is no further evidence that the Proposal design takes into account climate change. The projections provided in the REF include an increase in summer rainfall by up to 50%, and a temperature increase of between 1°C and 3°C by 2050. Evidence for adaptation to these projections, such as adequate stormwater capacity and selection of temperature resilient materials has not been provided.

In regards to GHG emissions, no modelling has been undertaken for the REF. The REF provides a list of the GHG emission sources from the construction and operation of the Proposal, and a brief discussion around the potential for an overall reduction on GHG emissions due to the Proposal enabling efficient, free flowing traffic, and a reduction in traffic congestion in the Queanbeyan CBD.

Without a quantitative GHG emissions assessment, it is difficult to determine whether the overall emissions profile would be significantly improved by the Proposal. This is particularly given the fact that emissions generated by the construction phase could partially offset the benefits from any operational efficiency improvements to the network. Notwithstanding, it is considered that no significant improvement in urban air sheds could be achieved without a reduction in the use of motor vehicle transport generally. The REF notes that Queanbeyan is delivering a public transport and cycling plan which is expected to reduce GHG on a per capita basis. The Proposal also includes a cycle lane along the Proposal, which is expected to make cycling an easier and safer option compared to alternative cycling routes within the area.

The REF proposes a number of safeguards which aim to reduce the GHG emitted during the construction of the Proposal which are considered adequate.

5.11 Waste Management

The consideration of waste in the REF is brief. The REF lists the likely sources of waste from the Proposal and provides a number of waste management measures to reduce the volume of waste produced. There are no waste volume estimations provided. The construction methodology provided in the REF, states excess excavated material would be used in another approved project that has a material shortage or alternative approved sites.

The potential impacts due to generated waste identified in the REF are limited to impacts resulting from pollution and contamination of the landscape, soils, waterways and reduced amenity. The REF does not discuss potential impacts on waste management infrastructure in the region. The waste management measures proposed aim to minimise the volume of waste produced, and treat any waste appropriately to prevent pollution and contamination. The measures proposed are considered acceptable, and residual impacts are expected to be unlikely.

5.12 Contamination

The assessment of potential contamination impacts from the Proposal is based on a Preliminary Site Investigation (PSI) (SMEC, 2014) undertaken for the Proposal alignment, and contamination investigations undertaken for the adjacent Jumping Creek Site (Coffey, 2010, Environmental Strategies 2012). The PSI identified that the EDE corridor comprises forested ridges, agricultural land, areas of cleared land, hardstand areas, and a parcel of land that was previously used for mining (the Jumping Creek site).

Based on a review of available historical aerial photographs, previous investigations for the area, and background information, the PSI identified four Areas of Environmental Concern (AEC). Three of these are considered to have low contamination potential in the REF, and include Asbestos Containing Materials (ACM) within the soil and fill material due to the potential presence of ACM lined pipes feeding adjacent areas, soil impacted by herbicides/pesticides/metals due to agricultural operations including a sheep dip, and the potential presence of septic tanks and discharge trenches within adjacent residential properties which may contain nutrient rich material and/or pathogens. Safeguard measures proposed to manage contamination risks from these potential sources are considered sufficient. Further, the identified AEC in the Jumping Creek site is downstream and outside of the Proposal alignment, therefore it is unlikely that any contaminants from this area would be encountered during construction of the Proposal.

The fourth identified AEC is the potential presence of elevated metal concentrations in soil/bedrock. The contamination potential for this AEC is identified as moderate in the REF, however safeguard measures proposed to mitigate potential exposure to metal oxides are considered adequate.

In summary, it is considered that the REF adequately assesses the contamination risks of the Proposal, and that the proposed safeguards are considered sufficient to mitigate the potential risks identified.

5.13 Cumulative Impacts

The REF provides a consideration of potential cumulative impacts that may result from the Proposal. The REF notes that no single project can provide an acceptable LOS throughout Queanbeyan, and that the Proposal is part of a recommended program of works to improve the Queanbeyan traffic network up to 2031. In light of this, the REF recognises that there will be cumulative impacts that will be both positive and negative. The REF also discusses some measures which are being put in place by QCC to ensure there is a strategic land use plan for future developments to protect and enhance the biodiversity values of the city whilst accommodating sustainable development.

Cumulative impacts are considered in the REF in terms of multiple impacts on a single receiver, and impacts of the Proposal in conjunction with impacts from other nearby projects.

The REF notes some potential negative cumulative impacts that could arise from a combination of impacts related to multiple environmental aspects, on a single receiver. Potential impacts identified include those related to erosion, amenity and habitat quality, however there is no comment on the extent and significance of these impacts.

In terms of negative cumulative impacts may result from other nearby projects, the REF notes the future residential development of Jumping Creek Estate, which is located adjacent to the Proposal. The REF states that this development is predicted to have some cumulative loss of biodiversity and wildlife connectivity, however concludes that the scope and scale of the impacts from this future development is not predictable at this time and likely to mitigated with best management practices. No further assessment of cumulative impacts associated with Jumping Creek is provided. It is however noted that any future development of the Jumping Creek Estate would be subject, in its own right, to detailed impacts assessment under relevant NSW and Commonwealth legislation.

The REF also notes two potential roundabout intersection upgrades located on the State road network at each end of the Proposal. These are the intersection of Lanyon Drive and Tompsitt Drive, Jerrabomberra, and Yass Road/Bungendore Road/Ellerton Drive, Queanbeyan. Potential cumulative impacts of these potential future projects have not been considered. Notwithstanding the assessment of cumulative impacts is considered adequate, and no additional mitigations are recommended to address any of the potential issues identified.

6.0 Conclusion

The Proposal has been assessed as required under Part 5 of the EP&A Act. The public consultation process completed for the Proposal is outlined in the Submissions Report (Appendix F) and summarised in Section 4.0, indicates a strong interest in the Proposal and generally an equal split between those submissions in favour of the Proposal (53%) and those who do not support it.

The mitigation and management measures proposed to address concerns raised in the submissions are generally considered adequate. These measures documented in the REF are proposed to be supplemented with additional recommendations outlined below.

The REF and submissions report have examined and taken into account to the fullest extent possible all matters likely to affect the environment by reason of the activity and established that the activity is not likely to significantly affect the environment. The clearing of native Red Stringybark Open forest and Box Gum Woodland vegetation and the Rosenberg's Goanna and Hoary Sunray species habitat will require offsets in accordance with the NSW OEH Biobanking methodology and the Commonwealth offsetting tool. Recommended offsets are outlined in the SIS Addendum 2 (2016) (Appendix B).

The Aboriginal Cultural Heritage Archaeological Report (Cultural Heritage Management Australia, 2014) must be updated to include the altered footprint so that a correct assessment is submitted for the S90 Aboriginal Heritage Impact Permit from the OEH.

As per section 112(1C) of the EP&A Act, an EIS is not required, despite section 112(1A) in respect of an activity that:

"(a) is on land that is, or is part of, critical habitat, or is likely to significantly affect threatened species, populations or ecological communities, or their habitats, and

(b) is not likely to significantly affect the environment except as described in paragraph (a),

if the determining authority has obtained or been furnished with a species impact statement in respect of the activity, prepared in accordance with Division 2 of Part 6 of the Threatened Species Conservation Act 1995. However, the provisions of this Part relating to environmental impact statements (other than subsection (1) (a) (i)) apply to the species impact statement as if references to an environmental impact statement included a reference to the species impact statement."

7.0 Recommendation

For the purposes of Part 5 of the EP&A Act, we recommend that the Proposal proceed as described in the REF, supporting documentation and this Determination Report (subject to concurrence from Chief Executive of the Office of Environment and Heritage and approval under the EPBC Act, and any other relevant conditions that may result). Any significant modification to the Proposal would be subject to further assessment.

It is also recommended that the Proposal be implemented in accordance with the REF, SIS and SIS Addendums (particularly Mitigation Measures in Chapter 6 and Offsets in Chapter 7 of SIS Addendum 2), and specifically the environmental management framework described in Chapter 7 of the REF and the site specific environmental safeguards outlined in Table 32 of the REF. In addition the following safeguards are also recommended:

1. **Prior to construction of the Proposal, further consult with noise-affected individual homeowners to determine any additional site-specific in-house treatment requirements as per section 6.1.8 of the REF.**
2. **Prior to construction, QCC will ensure that dilapidation surveys as per section 6.1.5 of the REF are undertaken of all buildings potentially subject to construction vibration effects.**
3. **In consultation with OEH develop a detailed landscape plan for the Proposal as per Table 22 of the REF, prior to the commencement of construction.**
4. **The Aboriginal Cultural Heritage Archaeological Report (Cultural Heritage Management Australia, 2012) must be updated to include any sites within the increased footprint so that a correct assessment is submitted for the s90 Aboriginal Heritage Impact Permit from the OEH.**

8.0 References

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Appendix A

Review of Environmental Factors

Appendix A Review of Environmental Factors

Appendix B

Species Impact Statement Addendum 2 Factors

Appendix B Species Impact Statement Addendum 2

Appendix C

Social Impact Assessment

Appendix C Social Impact Assessment

Appendix D

Squirrel Glider Survey

Appendix D Squirrel Glider Survey

Appendix E

Noise and Vibration Assessment 2016

Appendix E Noise and Vibration Assessment 2016

Appendix F

Submissions Report

Appendix F Submissions Report