Division 5.2 and EPBC Act Approval

Consistency assessment report

Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham

The Northern Road Upgrade – Mersey Road, Bringelly to Glenmore Parkway, Glenmore Park

December 2018

NSW GOVERNMENT | Transport Roads & Maritime Services

Revision	Date	Prepared by	Reviewed by
Draft 1	14/11/18	Carys Scholefield	Mark Terei
Draft 2	21/11/18	Carys Scholefield	Mark Terei
Final version	03/12/18	Carys Scholefield	Mark Terei

Contents

1 Introduction

1.1 The approved project

Roads and Maritime Services (Roads and Maritime) is upgrading 16 kilometres of The Northern Road between Mersey Road, Bringelly and Glenmore Parkway, Glenmore Park.

The Northern Road Upgrade – Mersey Road, Bringelly to Glenmore Parkway, Glenmore Park (herein referred to as "the project") was assessed under the former Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) (now, Division 5.2 of the EP&A Act) and Part 8 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). These approvals are herein referred to as the Division 5.2 Approval and EPBC Approval respectively.

The location and alignment of the approved project are shown in Figure 1-1 and key features are summarised as:

- A four-lane divided road between Mersey Road, Bringelly and Bradley Street, Glenmore Park (two general traffic lanes in each direction, with additional dedicated bus lanes at intersections). A central median would allow for an additional travel lane in each direction in the future, if required
- An eight-lane divided road between Bradley Street, Glenmore Park and just south of Glenmore Parkway, Glenmore Park (three general traffic lanes and a kerbside bus lane in each direction separated by a central median to be delivered when demand requires)
- About eight kilometres of new road between Mersey Road, Bringelly and just south of the existing Elizabeth Drive, Luddenham to realign the section of The Northern Road that currently runs through the Western Sydney Airport site
- About eight kilometres of upgraded and widened road between the existing Elizabeth Drive, Luddenham and just south of Glenmore Parkway, Glenmore Park
- Access to the Luddenham town centre from north of the realigned The Northern Road and the existing The Northern Road
- Twin bridges over Adams Road, Luddenham
- Four new traffic light intersections and new traffic lights at existing intersection
- Local road changes and upgrades to current access arrangements for businesses and private properties
- A new shared path for pedestrians and cyclists on the western side of The Northern Road and footpaths on the eastern side of The Northern Road where required.

A full description of the approved project is provided in Chapter 5 of the NSW Environmental Impact Statement (EIS) / Commonwealth Draft EIS (herein referred to as the "EIS") and amended in Chapter 4 of the NSW Submissions and Preferred Infrastructure Report and Commonwealth Final EIS (collectively referred to as the "SPIR and Final EIS").

As identified in Section 5.5 of the EIS, the project is to be delivered in three stages:

- Stage 4 – between Mersey Road, Bringelly and Eaton Road, Luddenham
- Stage 5 – between Littlefields Road, Luddenham and Glenmore Parkway, Glenmore Park
- Stage 6 – between Eaton Road, Luddenham, and Littlefields Road, Luddenham.

Construction of Stage 4 of the project commenced in November 2018 and is anticipated to be open to traffic in March 2021. Construction of Stages 5 and 6 are anticipated to commence in early 2019 and June 2019, respectively, and are anticipated to be open to traffic at the end of 2022 and 2021, respectively.

1.2 Post approval design changes

Roads and Maritime has made minor changes to the project following receipt of the Division 5.2 Approval and EPBC Approval. Changes to Stages 4 and 5 of the project were documented in the following reports.

Stage 4:

- *Consistency assessment report, Proposed changes between Mersey Road, Bringelly and Eaton Road, Luddenham* (Roads and Maritime, July 2018)
- *Draft Consistency assessment report, Proposed changes between Mersey Road, Bringelly and Eaton Road, Luddenham* (Roads and Maritime, November 2018)

Stage 5:

- Consistency assessment report, Proposed changes between Littlefields Road, Luddenham and Glenmore Parkway, Glenmore Park (Roads and Maritime, October 2018)

The project must be carried out in accordance with these consistency assessments, in addition to the Division 5.2 Approval (and associated conditions), the EPBC Act Approval (and associated conditions), the EIS, and the SPIR and Final EIS.

Changes to Stage 6 of the project relative to the Division 5.2 Approval and EPBC Approval are described in Chapter 2 of this report and in *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham* (Roads and Maritime, December 2018). These design changes comprise minor changes along the length of the alignment, and more substantial design changes at Adams Road.

1.3 Purpose of consistency assessment

The purpose of this consistency assessment is to:

- Describe the proposed minor changes relative to the Division 5.2 Approval and the EPBC Approval
- Assess the environmental impacts associated with the proposed minor changes relative to the Division 5.2 Approval and the EPBC Approval
- Determine if the proposed minor changes are consistent with the Division 5.2 Approval or whether further approval is required either for a modification application or a new project
- Determine if the proposed minor changes are consistent with the EPBC Approval or whether a variation to the conditions of approval / a conditioned action management plan or a new referral is required.

The more substantial design changes relate to the replacement of the twin bridges at Adams Road with an at-grade signalised intersection. These changes are the subject of a modification assessment (*Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham* (Roads and Maritime, December 2018). Accordingly, it is not the purpose of this consistency assessment to assess the environmental impacts of such changes, and the proposed minor changes only have been assessed where possible.

However, given the interrelation between the proposed minor changes and the more substantial changes proposed by the modification, some aspects of the environmental assessments are inextricably linked, and as such it has not been possible to fully separate the environmental impacts of all design changes. Where it has not been feasible to differentiate the environmental assessment of the minor changes from the more substantial changes proposed by the modification, the changes are assessed together in total.

2 Proposed change

2.1 Description of proposed change

The project as described in the Division 5.2 Approval and the EPBC Approval is detailed in Chapter 5 of the EIS and amended in Chapter 4 of the SPIR and Final EIS. The proposed design changes to Stage 6 of the project are shown on Figure 2-1. For descriptive purposes within this consistency assessment, the design changes have been divided into:

- Minor design changes, generally consistent with the description of the project as described in the Division 5.2 Approval and the EPBC Approval
- Design changes that are not generally consistent with the description of the project as described in the Division 5.2 Approval and the EPBC Approval, thereby requiring a modification to the Division 5.2 Approval.

Although the minor design changes are generally consistent with the description of the project as approved, they will only proceed as described if the proposed modification is approved.

2.1.1 Minor design changes

Roads and Maritime has made minor changes to Stage 6 of the approved project as follows:

- Reduced median width and cross-sectional area between intersections, while maintaining provisions for an ultimate eight lane configuration in the future as demand requires
- Replace kerb and gutter with grass swale, except at footpath locations near Adams Road and Elizabeth Drive intersections
- Changes to drainage structures (pit, pipes, culverts, swales) to suit horizontal and vertical geometry
- Reduction of verge (and removal of provision for any future footpath) along the eastern side of The Northern Road from five metres to one metre wide.
- Other minor refinements to the vertical and horizontal alignment of the road at various locations
- Cut and fill batter slopes revised from 1:4 to 1:3 in most places. Benching added to high cuts between chainage 6320 – 6620
- Removal of street lighting mid-block
- Street lighting added for turning heads along Elizabeth Drive
- Bus stop areas added on north-bound and south-bound lanes at Adams Road and Elizabeth Drive intersections
- Various private property driveway amendments, including some new accesses
- Provision of two cantilevered variable messaging signs (VMS) over The Northern Road about 700 metres north and south of Elizabeth Drive.
- Changes to the construction and operational footprint from the design in the SPIR and Final EIS as described in Section 2.1.3 below.

No substantial changes to construction methodology, working hours, plant and equipment or ancillary facilities are proposed as part of these design changes. The proposed changes are generally consistent with the description of the project as described in the Division 5.2 Approval and the EPBC Approval. These minor changes are the subject of environmental assessment in this consistency assessment report.

2.1.2 Proposed modification design changes

Roads and Maritime proposes to modify the Division 5.2 Approval to replace the approved twin bridges over Adams Road with an at-grade signalised intersection.

The proposed modification would comprise:

- Not constructing the approved bridge structure over Adams Road (comprising twin 30 metre long, ten metre high single span bridges)
- Provision of an at-grade signalised intersection, including the addition of left and right turn lanes on Adams Road and The Northern Road to accommodate all vehicle movements
- Provision of pedestrian crossing facilities at the proposed intersection with Adams Road
- Reducing the vertical alignment by up to five metres along The Northern Road extending about 400 metres north and south of the proposed at-grade intersection
- Increasing the vertical alignment of Adams Road by up to eight metres (extending about 400 metres west of the proposed at-grade intersection) and lowering the alignment (extending about 400m east of the intersection) to tie-in with the revised vertical alignment of The Northern Road
- Filling one additional privately owned farm dam at the south-eastern corner of the proposed at-grade intersection to accommodate a fill embankment
- Increase in the partial filling and reforming of a privately owned farm dam, including dam wall modifications, at the north-western corner of the proposed at-grade intersection to accommodate fill embankments. The capacity of this dam would be reduced as a consequence.
- Increasing the construction and operational footprint from the design in the SPIR and Final EIS as described in Section 2.1.3 below.

The proposed signalised intersection would allow all vehicle turning movements between The Northern Road and Adams Road. This would allow access between The Northern Road and Adams Road without the need to travel through Luddenham town centre, and access to the Luddenham town centre from Adams Road intersection. The total number of signalised intersections along the entire The Northern Road Upgrade project would increase to five. No change to the speed limit along The Northern Road is proposed.

Further information regarding the construction methodology and environmental assessment of the proposed modification is provided in *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham* (Roads and Maritime, December 2018).

2.1.3 Project boundary

Proposed changes to the approved construction and operational project boundaries due to the proposed design changes are shown in Figure 2-2 and Figure 2-3 and are limited to:

- Minor increases to the construction boundary to allow private property access adjustments
- A reduced footprint for the ancillary facility area (and associated construction boundary) at the south-eastern corner of Elizabeth Drive and The Northern Road intersection
- Slight rationalisation (reduction) of the operational boundary at three locations based on the minor vertical, horizontal and cross-section alignment refinements proposed and consultation with affected property owners to reduce and simplify property acquisition.
- An increased construction and operational footprint around Adams Road to enable the regrading of this road (associated with the proposed modification).

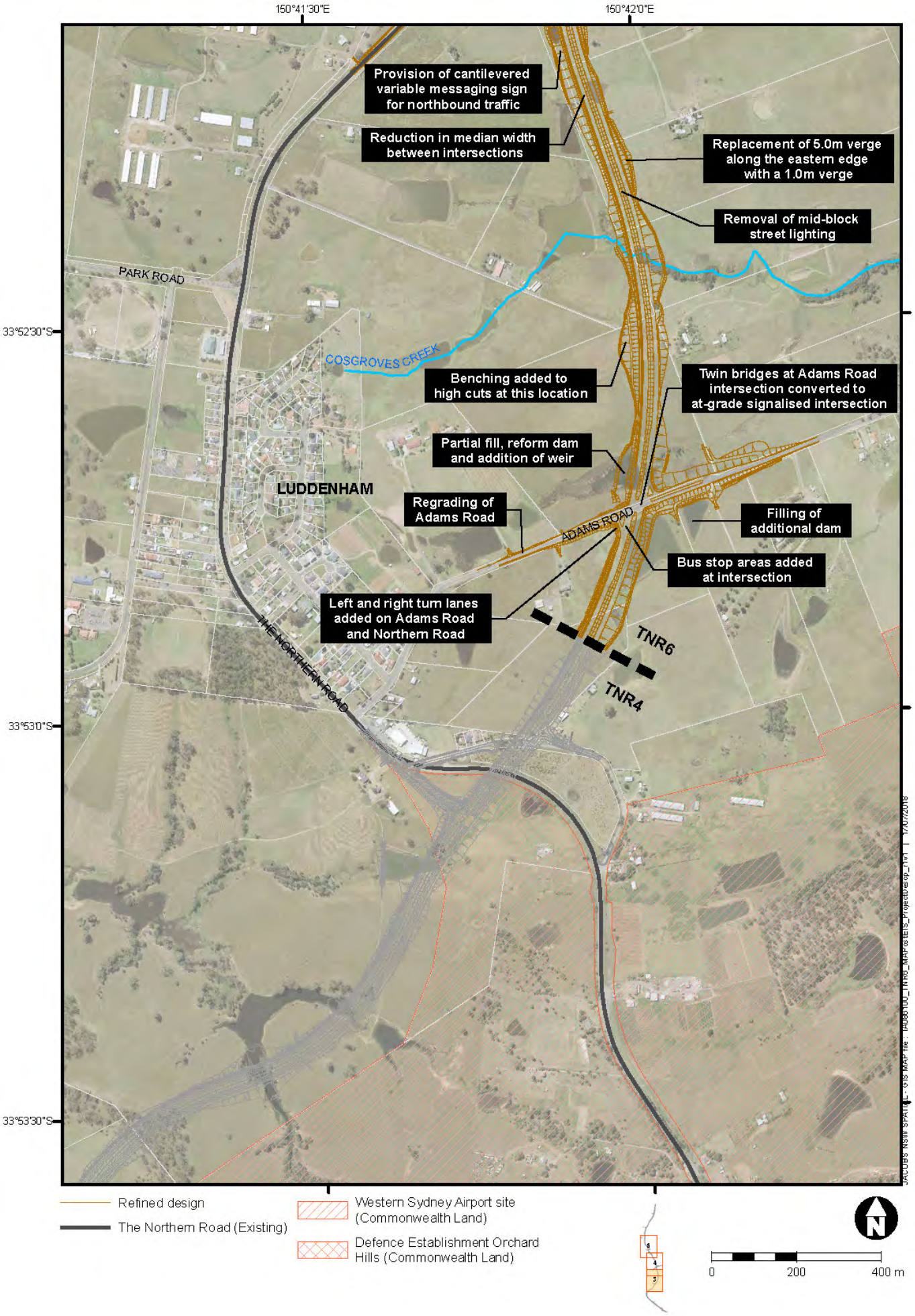
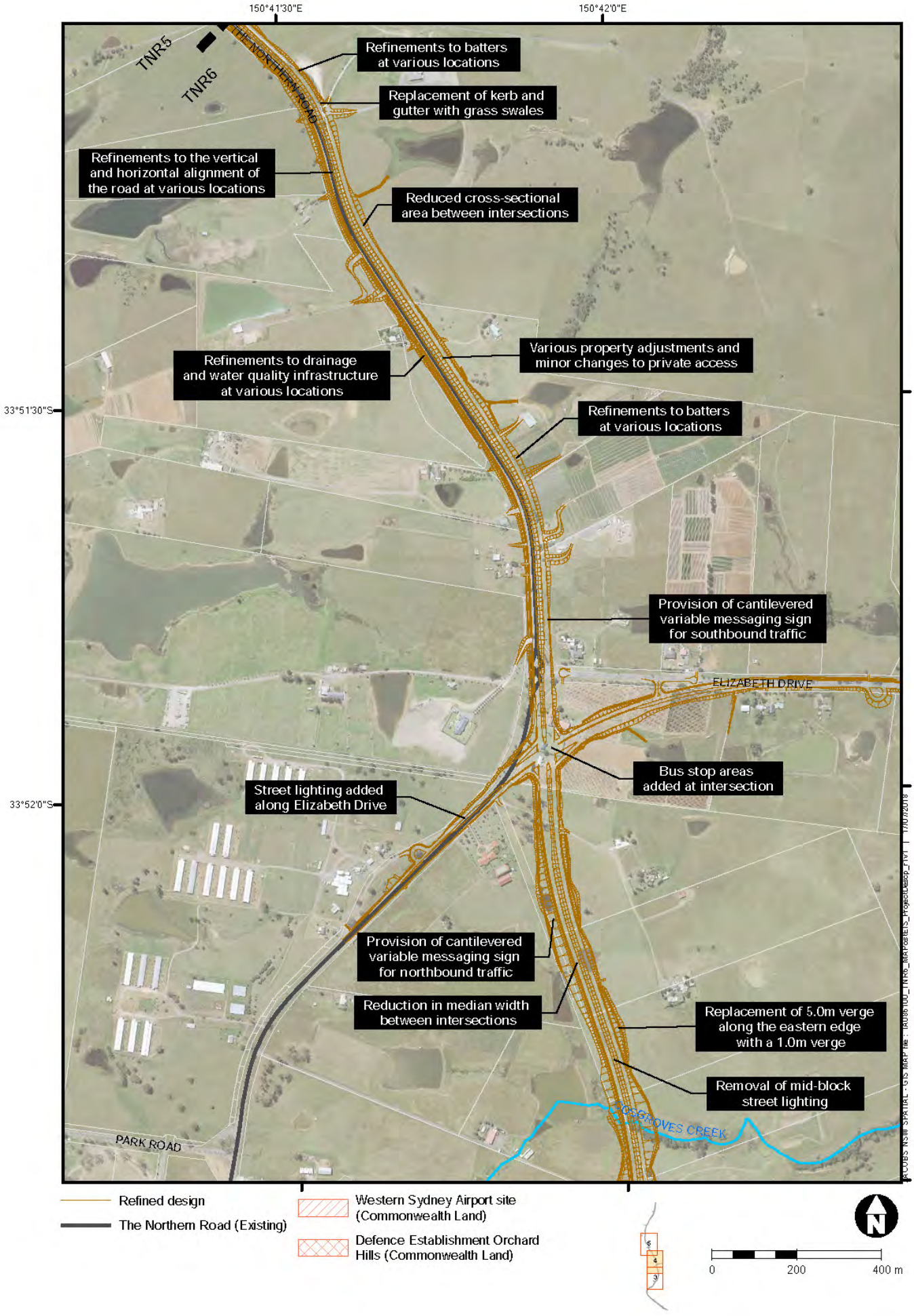


Figure 2-1 Overview of proposed changes for the project



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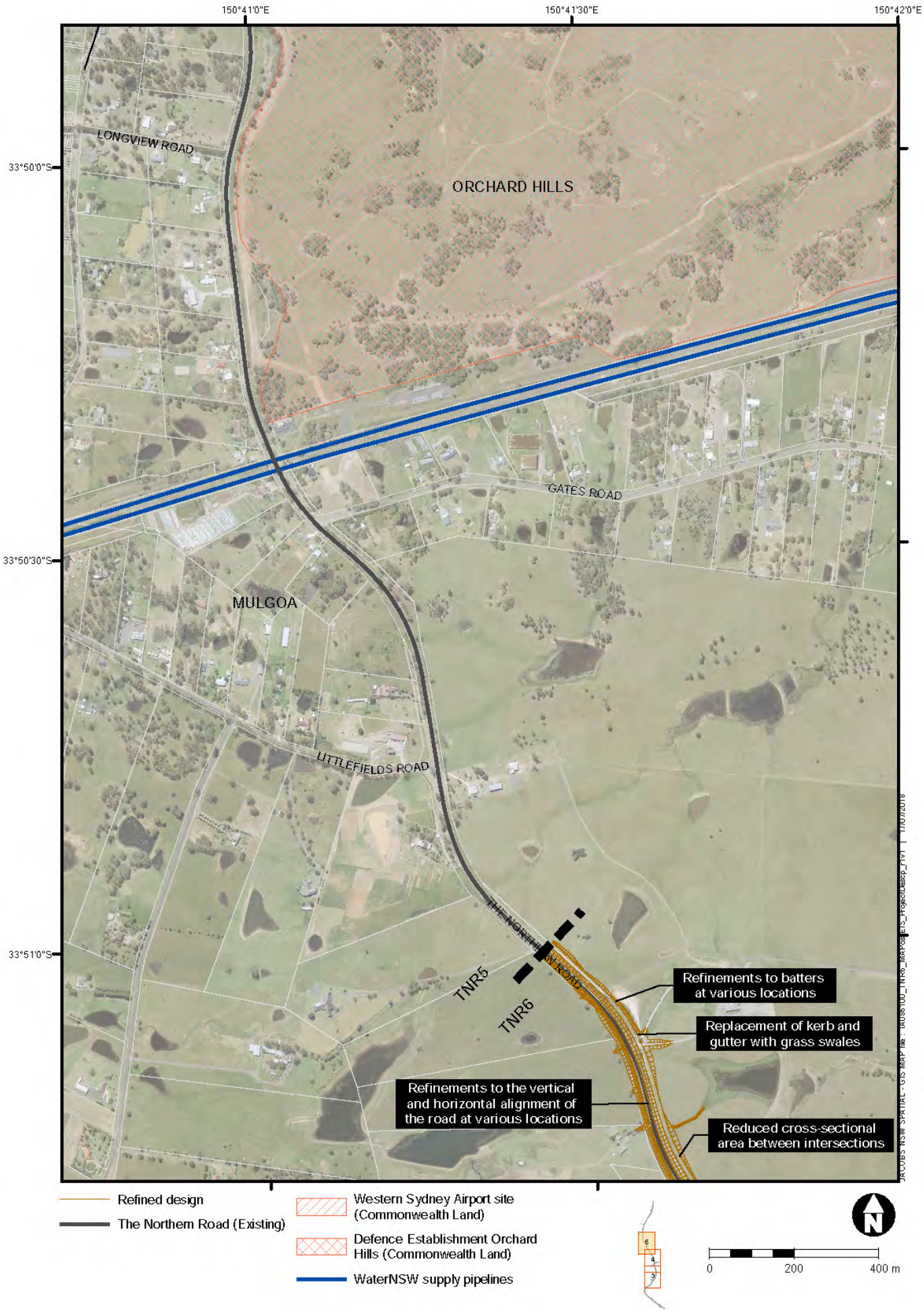

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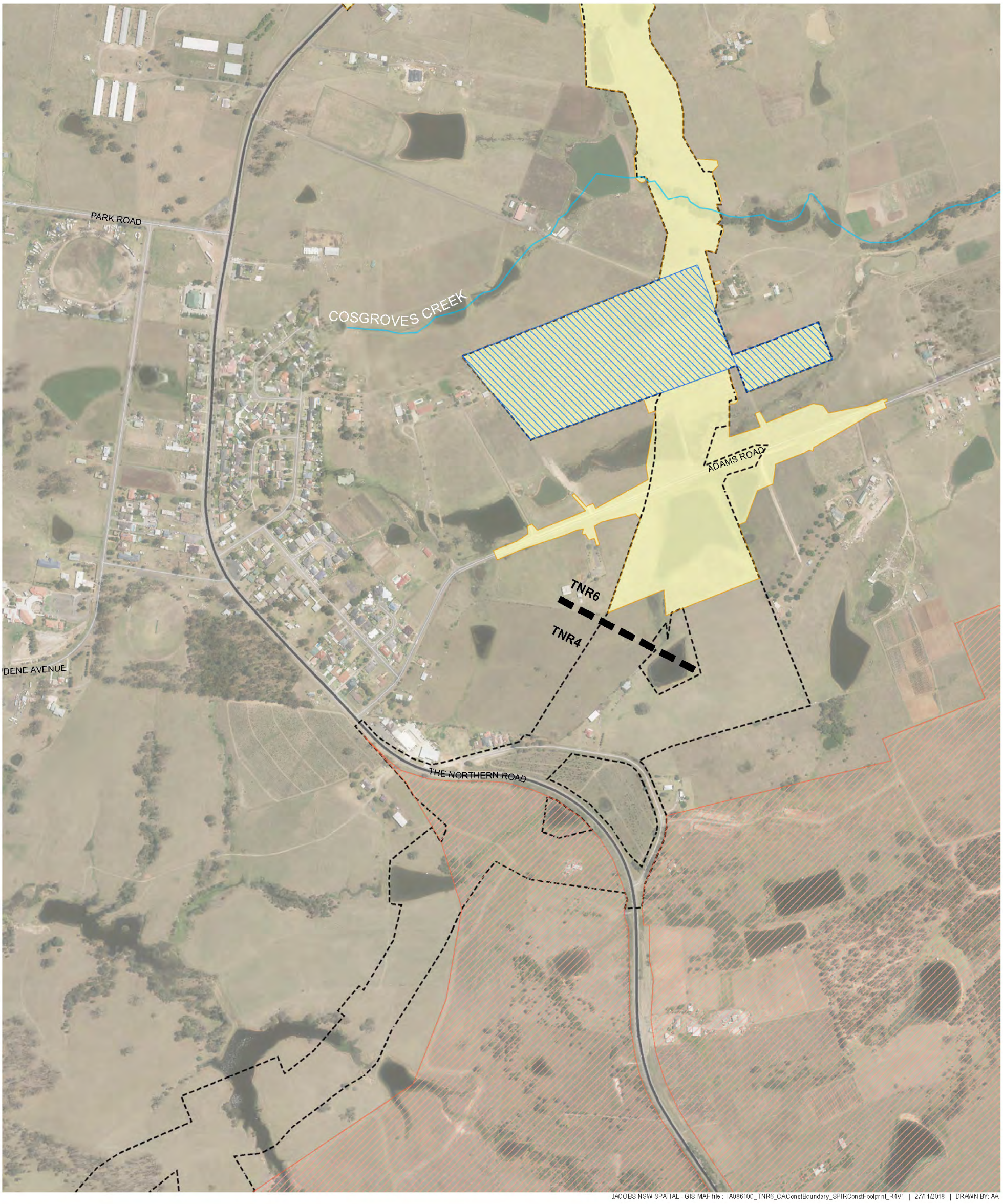

Figure 2-2 Comparison of SPIR/ Final EIS and refined construction footprints

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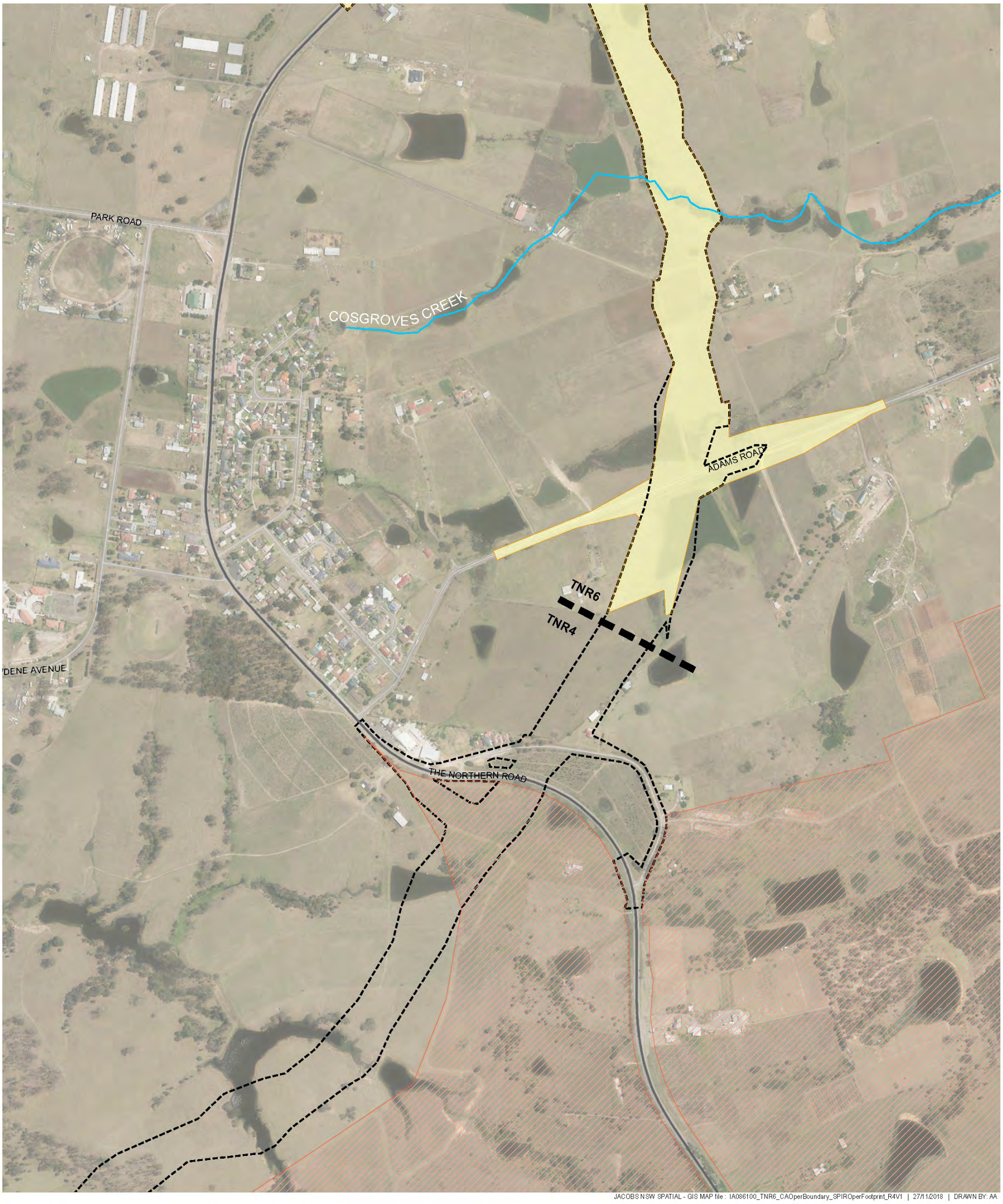

Figure 2-3 Comparison of SPIR/ Final EIS and refined design operational footprints

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Figure 2-3 Comparison of SPIR/ Final EIS and refined design operational footprints

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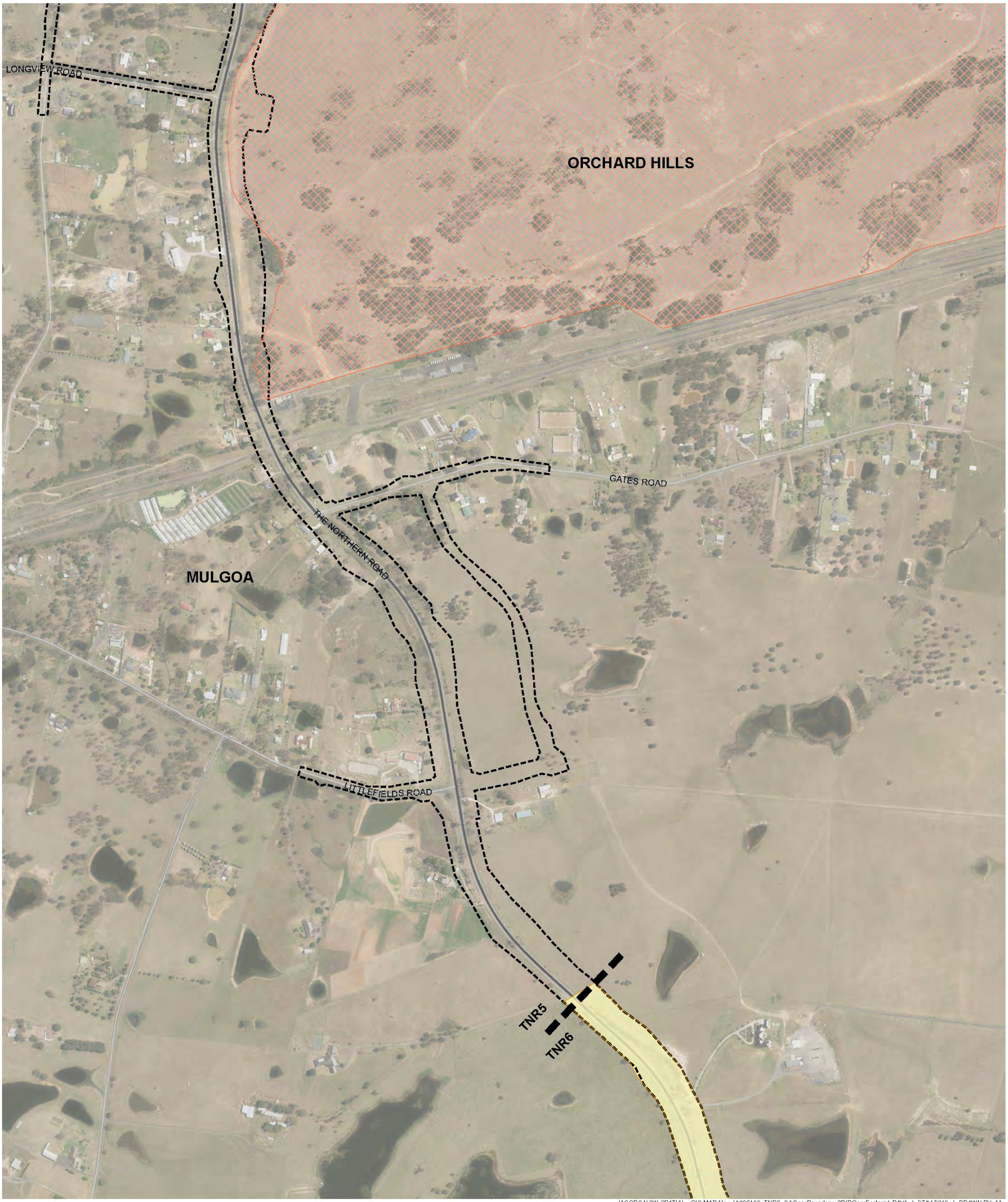

Figure 2-3 Comparison of SPIR/ Final EIS and refined design operational footprints

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2.2 Need

Design changes described in Section 2.1 were primarily derived from a Final Business Case review of the project by Infrastructure NSW. The review resulted in a number of critical recommendations which needed to be addressed before final funding approval.

A key recommendation was to reconsider all of the recommendations of a Value Engineering Study (April 2017) before finalising the detailed design and Final Business Case, and implement those initiatives that are considered feasible.

The Value Engineering Study identified the need for a number of design changes to reduce the costs associated with the project. The key value engineering options adopted and factors considered in the analysis of the design changes are presented in Table 2-1.

Table 2-1 Summary of Value Engineering Study

Key Value Engineering Options Adopted	Factors considered (in no particular order)
Proposed modification • Replacement of the twin bridges at Adams Road with a signalised intersection (the subject of the proposed modification considered in separate report)	• Design, construction and maintenance costs • Property acquisition outcomes • Earthwork extents and environmental impacts (biodiversity and other) • Potential project approval implications, program impacts and delivery delays • Community and stakeholder consultation requirements • Predicted traffic and pedestrian numbers
Minor changes: • Reducing median widths and cross-sectional area • Optimise cut and fill batter slopes • Reduced culvert lengths • Removing the kerb and gutter and associated long drainage infrastructure, replacing with table drains • Removing shared path lighting • Reduction of verge (and removal of provision for any future footpath) on eastern side	• Design, construction and maintenance costs • Property acquisition outcomes • Earthwork extents and environmental impacts (biodiversity and other) • Amenity and social benefit • Previously made public project commitments and Roads and Maritime reputation with the community and stakeholder • Community and stakeholder consultation requirements • Potential project approval implications, program impacts and delivery delays • Predicted traffic and pedestrian numbers • Capacity and resilience of the proposed upgrade for the initial period of operation • Sustainability outcomes • Road safety design

The adoption of these key value engineering options as the outcome of the Value Engineering Study was agreed with Roads and Maritime Sydney Development Committee.

Other proposed minor changes, as listed in Section 2.1.1, were the outcome of further consultation with stakeholders.

3 Consultation

Consultation has been carried out throughout the evolution of the project. Activities carried out prior to the project approval are detailed in Chapter 6 of the EIS and Section 1.2 of the SPIR and Final EIS.

For the proposed design changes, a communication plan was developed that highlighted details such as key messages, identified stakeholders to be consulted and communication delivery methods. This plan was implemented during August and September 2018 with directly impacted landowners and stakeholders provided with advance information prior to the public consultation. The comprehensive community consultation focused on the substantial design changes at Adams Road and consisted of eight meetings, 289 emails and phone calls and one community pop-up session. Written feedback was received from 10 community members, one community association, two stakeholders. and six directly impacted landowners. The main issues raised in feedback are summarised within the *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham,* (Roads and Maritime, December 2018).

The changes will also be communicated as part of the changes to the wider project (including other stages) via briefings to stakeholders, ongoing consultation with affected property owners and public information material.

4 Environmental assessment

4.1 Scope of environmental assessment

An assessment has been carried out to compare the environmental impacts of the proposed minor changes to the project (as described in Section 2.1.1) relative to the environmental impacts of the approved project.

The proposed minor changes only have been assessed where possible. However, given the interrelation between the proposed minor changes and the more substantial changes proposed by the modification, some aspects of the environmental assessments are inextricably linked. Where it has not been feasible to differentiate the two elements of the environmental assessment, the changes are assessed together, in total, by necessity.

The design changes at Adams Road are the subject of a separate Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham, (Roads and Maritime, December 2018).

Methods for environmental assessment of the proposed changes are the same or equivalent to those adopted for the EIS and the SPIR and Final EIS.

Table 4-1 provides a summary of the environmental assessment of the proposed changes.

As indicated in Table 4-1, the proposed changes to the project are unlikely to substantially change the approved project's overall impact on the following environmental factors and they are therefore not assessed in detail in this report beyond Table 4-1:

- Aboriginal heritage
- Non-Aboriginal heritage
- Air quality
- Resource and waste management
- Climate change and greenhouse gas
- Hazards and risks
- Cumulative impacts.

Table 4-1 Environmental assessment of the proposed changes

Environmental issue	Anticipated change in impact (relative to the approved project)
Traffic and transport	Detailed consideration of traffic and transport impacts is presented in Section 4.2. **The traffic and transport impacts from the proposed minor design changes are expected to be consistent with the SPIR and Final EIS.**

Environmental issue	Anticipated change in impact (relative to the approved project)
Noise and vibration	There is no substantial change to construction footprint or construction activities relating to the proposed minor changes. The construction noise impacts are **consistent with the SPIR and Final EIS.** The changes in road height, topography and alignment have the potential to result in changes to noise impacts during the operational phase. The operational noise assessment provided in Appendix D of the *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham,* (Roads and Maritime, December 2018) assesses the potential impacts of the proposed minor changes together with the proposed modification. A summary of the operational noise impacts (including all proposed design changes in Section 2.1) is provided in Section 4.3. This concludes that **the proposed design and potential operational noise impacts are expected to be consistent with the SPIR and Final EIS.**
Biodiversity	Detailed consideration of biodiversity impacts is presented in Section 4.4. The assessment considered the potential biodiversity impacts of both the proposed minor changes and the proposed modification together. The proposed changes (as described in Section 2.1) would result in the removal of an additional 0.27 hectares of native vegetation consisting of the following vegetation zones as outlined in the SPIR and Final EIS: • Veg Zone 8: Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion = 0.03 hectares • Veg Zone 9: *Phragmites australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion = 0.24 hectares. Vegetation Zone 8 has been identified as part of the Cumberland Plain Woodland in the Sydney Basin Bioregion Critically Endangered Ecological Community (CEEC) under the TSC Act. Some areas of this vegetation zone meet the thresholds for the EPBC listed CEEC, however none of these areas occur within the area subject to impact within this report. While this is an increase in vegetation clearance, the project's impact on biodiversity is calculated based on the entire construction footprint, which is conservative. Requirements for contractors to minimise clearing during construction could reduce the impact calculated in the SPIR and Final EIS, and associated offset requirements. This assessment has been based on the maximum clearing anticipated. The actual vegetation cleared would be equal to or lower than assessed. Final offset calculations will be based on survey of actual vegetation cleared and reported in the Biodiversity Offset Package in consultation with OEH. Overall, the increase in area of vegetation removal is considered **minor and biodiversity impacts are expected to be consistent with the SPIR and Final EIS.**

Environmental issue	Anticipated change in impact (relative to the approved project)
Hydrology and flooding	The potential impacts of the project on flooding behaviour and the scour potential within receiving drainage lines has been considered during the detailed design phases of the project. The current detailed design includes all proposed changes described in Section 2.1; the proposed minor changes and the proposed modification were assessed together. Detailed flood modelling has also been carried out to identify the potential residual flooding and drainage related impacts of the project following the incorporation of a preferred set of transverse drainage upgrade and flood mitigation measures into the detailed design. The hydrology and flooding impact assessment is summarised in Section 4.5. The results indicate that the impacts of the project (including all proposed changes described in Section 2.1) on flooding behaviour in the Cosgroves Creek catchment would generally be the same as was assessed in the EIS. By extension, the impact of the project on scour potential in the receiving drainage lines would also generally be the same as what was assessed in the SPIR and Final EIS. There are minor exceptions to this, which have been assessed. The locations where runoff from the project corridor will discharge to the receiving drainage lines is generally the same as was assessed in the EIS, even though the previously assessed kerb and gutter has been replaced by grassed swales at various locations. The only exception is along the northern side of Adams Road, west of its intersection with The Northern Road, where runoff from the eastbound lanes will sheet off the road into the nearby privately-owned dam. Given the relatively small paved area that will drain to the adjacent property, combined with the sheet flow nature of the flow, the discharge of runoff from Adams Road will not cause scour of the adjacent grassed area. In summary, **the potential hydrology and flooding impacts of the proposed design changes are expected to be consistent with the SPIR and Final EIS.**

Environmental issue	Anticipated change in impact (relative to the approved project)
Soils, water and contamination	The proposed minor design changes would marginally increase the construction footprint, associated with the property adjustments. Ground disturbance in these areas would be minimal and carried out within the appropriate controls set out in the SPIR and EIS. The steepening of batter slopes would reduce the volume of soil required for earthworks. The mitigation measures for soil and spoil management measures outlined in the SPIR and Final EIS are comprehensive and cover all potential identified impacts. Overall it is considered that impacts to soil **would be consistent with those set out in the SPIR and Final EIS.** The current operational drainage design, including all proposed changes described in Section 2.1, comprises 48 water quality controls (37 vegetated swales and 11 vegetated batter buffer areas) treating approximately 27.1 hectares of disturbed catchment area. The SPIR and Final EIS operational drainage design comprised 12 vegetated swales treating approximately 29.9 hectares of disturbed catchment area. A detailed assessment of surface water impacts is presented in Section 4.6. In summary, MUSIC modelling was carried out to determine pollutant load reductions that can be achieved by the proposed controls. The modelling indicated that the updated road geometry and drainage design would deliver a slight improvement in water quality and therefore **the proposed design and potential water quality impacts are expected to be consistent with the SPIR and Final EIS**. Given the nature of the proposed changes, no additional risks to groundwater have been identified. **The proposed design and potential groundwater impacts are expected to be consistent with the SPIR and Final EIS**. Land use along The Northern Road alignment where minor adjustments to the construction boundary are proposed are consistent with adjacent areas previously assessed (given rural residential and small scale agricultural land use). Therefore, the same contamination assessment conclusions (risk profile) in the SPIR and Final EIS are considered applicable to these additional areas. **The proposed design and potential contamination impacts are expected to be consistent with the SPIR and Final EIS.**

Environmental issue	Anticipated change in impact (relative to the approved project)
Urban design and visual impact	The urban design and visual impact assessment report provided in Appendix E of the *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham,* (Roads and Maritime, December 2018) assessed the proposed minor design changes together with the proposed modification. A summary of this assessment is provided in Section 4.7. The proposed changes in embankment topography and highway infrastructure (including the introduction of two VMS and removal of mid-block lighting) would have local impacts on landscape character and visual impacts. The proposed changes would not alter the overall magnitude of the project's landscape character impacts and therefore the landscape character impact rating identified in the SPIR and Final EIS remains unchanged at moderate-high. The combined visual impacts of the current revised design (including all design changes described in Section 2.1) results in the magnitude rating remaining high at a viewpoint nearest to the proposed Adams Road intersection. Therefore, **the proposed design and potential urban design and visual impacts are expected to be consistent with the SPIR and Final EIS.**
Aboriginal heritage	The marginal additional construction footprint of the current revised design (including all design changes described in Section 2.1) was within the study area and therefore assessed as part of the archaeological survey and cultural heritage assessment completed for the EIS. The proposed changes would not result in any additional impact on Aboriginal heritage. **The proposed design and potential Aboriginal heritage impacts are expected to be consistent with the SPIR and Final EIS.** The proposed changes would be carried out in accordance with the CEMP and Heritage Management Sub-plan. The proposed changes do not have any significant potential to cause a change to the intent, meaning or outcomes of 'Aboriginal Cultural Heritage' Conditions of Approval.
Non-Aboriginal heritage	The marginal additional construction footprint of the current revised design (including all design changes described in Section 2.1) was reviewed as part of this consistency assessment. There are no non-Aboriginal heritage items identified within the additional footprint. The proposed changes would not result in any additional impact on non-Aboriginal heritage. **The proposed design and potential non-Aboriginal heritage impacts are expected to be consistent with the SPIR and Final EIS.** The proposed changes would be carried out in accordance with the CEMP and Heritage Management Sub-plan. The proposed changes do not have any significant potential to cause a change to the intent, meaning or outcomes of 'non-Indigenous Heritage' Conditions of Approval.

Environmental issue	Anticipated change in impact (relative to the approved project)
Socio-economic and land use	Minor increases to the construction boundary are proposed to allow private property access adjustments. These construction impacts are temporary in nature and the works would be designed and carried out following consultation with landowners. The SPIR and Final EIS included assessment of similar property adjustment works, therefore **the proposed design and potential lease area impacts are expected to be consistent with the SPIR and Final EIS**. There would be slight reductions to the project operational boundary. The addition of bus stops at the Adams Road and Elizabeth Drive intersections is likely to have benefits for public transport access. The intersection would also improve connectivity due to improved access to and from Adams Road. The reduction of the verge on the eastern side of the proposed main alignment from 5.0 metres to 1.0 metre would remove the provision for a future shared path on this side. As the SPIR and Final EIS only provided provision for a shared path on the eastern side of the road, this change is considered a benefit that is no longer being provided, rather than an additional impact. The impact of this change is considered minor as a shared path is provided along the western side, and pedestrian and cycle access and connectivity is maintained by the western shared path. Impacts on amenity from construction and operation, and the social and economic impacts of the project to the local community and businesses were assessed in detail in the EIS. It is expected that the impacts of the proposed changes would be consistent with these findings. The proposed changes do not have any significant potential to cause a change to the intent, meaning or outcomes of the 'Property and Land Use' Conditions of Approval. In summary, **the proposed design and potential socio-economic and land use impacts are expected to be consistent with the SPIR and Final EIS.**
Air quality	Sensitive receivers near proposed property adjustment works have the potential to experience a minor increase in air quality impacts during construction. However, any impacts would be minor and temporary in nature. Otherwise, the proposed minor design changes would not substantially alter the distance to sensitive receivers or air quality impacts during operation. Therefore, there are no changes to the mitigation measures proposed and the proposed changes do not have any significant potential to cause a change to the intent, meaning or outcomes of 'Air Quality' Conditions of Approval. **The proposed design and potential air quality impacts are expected to be consistent with the SPIR and Final EIS .**

Environmental issue	Anticipated change in impact (relative to the approved project)
Resources and waste management	The proposed changes would not result in any additional waste streams from those identified in the EIS. Some of the proposed minor changes may reduce the amount of construction materials required. These changes include: • Reduced median width between intersections • Steepening of batters • Refinements to drainage and water quality infrastructure (deletion of kerb and gutter in preference of grass table drains). Some of the proposed minor changes may increase the amount of construction materials required. These changes include: • Provision of VMS • Refinements to pavement of local roads and property accesses. Whilst the increase in additional footprint required would slightly increase the amount of waste from vegetation clearance, **overall the proposed design and potential resource consumption and waste generation impacts are expected to be consistent with the SPIR and Final EIS .** The proposed changes do not have any significant potential to cause a change to the intent, meaning or outcomes of 'Waste' Conditions of Approval. A Sustainability Strategy for the approved project would be prepared in accordance with NSW Minister's Conditions of Approval E51 and E52. This Sustainability Strategy would cover the proposed changes.
Climate change and greenhouse gas	The proposed changes would not result in any significant changes to emission generating activities assessed in the SPIR and Final EIS and therefore would be unlikely to result in more than a negligible increase in the greenhouse gas emissions during construction. The proposed changes would not result in a substantial change in total traffic volumes, congestion (level of service), or average speeds and therefore would be unlikely to result in more than a negligible increase in greenhouse gas emissions during operation. The proposed changes would not result in a change to the climate change risks assessment outlined in the SPIR and Final EIS. **The proposed design and potential greenhouse gas and climate change impacts are expected to be consistent with the SPIR and Final EIS.**
Hazard and risks	The proposed changes would not result in any additional hazards or risks during construction and operation of the project.
Cumulative impacts	The proposed changes assessed in this report would generally be consistent with the outcomes of the Final SPIR and EIS, taking into account revised impacts of the project as outlined in Chapter 4 of this report. There is a combination of marginally reduced and marginally increased impacts relating to the proposed changes, meaning **cumulative impacts would be consistent with the SPIR and Final EIS**.

4.2 Traffic and transport

4.2.1 Introduction

The traffic and transport impacts for the approved project were addressed in Section 7.1 and Appendix G of the EIS and updated in the SPIR and Final EIS. This Section addresses the traffic, transportation and access impacts of the proposed minor design changes as described in Section 2.1.1 of this report.

4.2.2 Existing environment

The Northern Road is a State road within Sydney's road network and is one of the main north–south connections in south-western Sydney. The approved upgrade is described in Chapter 5 of the EIS, amended in Chapter 4 of the SPIR and Final EIS, and repeated in Section 1.1 of this report.

4.2.3 Impact assessment

Construction traffic

The proposed minor changes would not result in substantial changes to construction traffic generation as assessed in the SPIR and Final EIS. Therefore, no change to the assessment findings of the construction traffic assessment is expected.

Operation traffic

Road network performance

The proposed minor design changes, as described in Section 2.1.1, do not affect intersection arrangements (intersection control, intersection capacity and allowed movements). Therefore, no substantial change in intersection Level of Service is expected as a result of the proposed minor changes.

The proposed minor design changes, as described in Section 2.1.1, do not affect intersection arrangements and midblock capacity for general traffic. Therefore, no substantial change in corridor travel time is expected as a result of the proposed minor changes.

Local roads and access

The proposed minor changes, as described in Section 2.1.1, do not affect permitted movements at intersections, median breaks and turn-back facilities. Therefore, no change to local access is expected.

Public transport

The proposed minor design changes allows for construction of bus stop areas at the intersections with Adams Road and Elizabeth Drive for the existing 789 bus route. This allows designated space for public transport users away from the footpath and for the installation of bus shelters at a later date.

Freight and aviation

The project would reduce travel time and improve reliability for freight travelling to the Sydney Motorway network via the M4 Western Motorway and providing an alternative route for freight traffic travelling to and from the Western Sydney Airport. No substantial change in road network performance is expected. Therefore, no change in impacts to freight and airport access are expected.

Design of the project has been undertaken based on requirements to conform to restrictions associated with height and visibility when in close proximity to the Western Sydney Airport, and to account for access to the Western Sydney Airport. These aspects of design have not changed and consequently there is unlikely to be any impact of the project on associated aviation activities.

Active transport

The provision of pedestrian crossings around the Adams Road intersection means that all pedestrian movements along Adams Road would be possible. Therefore, no substantial change in pedestrian movement at intersections is expected.

The removal of the 5.0 metre verge on the eastern side of the proposed main alignment would remove the provision for a future shared path on this side. As the EIS, SPIR and Final EIS only provided provision for a shared path on the eastern side of the road, this change is seen as a benefit no longer being provided, rather than an additional impact. Any impact is considered minor as a shared path is provided along the western side and pedestrian and cycle access and connectivity is thus maintained by the western shared path. The proposed minor changes to The Northern Road Upgrade design would not significantly change the outcomes of the project for pedestrians and cyclists.

Parking

Parking is currently not permitted on The Northern Road and was not proposed by the design at the SPIR and Final EIS stage. Therefore, there would be no impact on parking.

Road safety

Design speed, functionality and capacity of The Northern Road for general traffic remains unchanged due to the proposed changes. Therefore, no substantial changes to road safety are expected. The addition of two VMS near to the intersection with Elizabeth Drive would allow the communication of up-to-date traffic information with drivers, thereby having a beneficial impact on road safety.

4.2.4 Mitigation / management

The traffic management measures documented in the SPIR and Final EIS would be implemented for the proposed project changes as per the Traffic and Transport Sub-Plan within the Construction Environmental Management Plan (CEMP) for the approved project. The measures would be developed in accordance with Ministers Conditions of Approval E53-E59.

No additional mitigation measures are proposed for the minor design changes.

4.3 Noise and vibration

4.3.1 Introduction

The operational noise assessment provided in Appendix D of the *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham,* (Roads and Maritime, December 2018) assesses the potential impacts of the proposed minor changes together with the proposed modification. The operational noise assessment is summarised in this Section.

4.3.2 Existing environment

Presently, daytime and night-time ambient noise in the area is determined primarily by traffic conveyed along the existing The Northern Road, and secondarily, by traffic on adjoining roads such as Elizabeth Drive and Adams Road. Traffic count surveys have been conducted along

Adams Road to establish the level of background noise due to this traffic and to support the noise assessment for the proposed changes.

As described in the SPIR and Final EIS, the noise environment would be affected by the construction of the approved project, and during operation of the new The Northern Road alignment.

4.3.3 Impact assessment

Assessment methodology

A quantitative construction and operational noise assessment was prepared for the proposed modification. This operational noise assessment also considers the proposed minor design changes. Information regarding the noise model used for the assessment including the study area, algorithm, model parameters, and input data is provided in Appendix D of *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham,* (Roads and Maritime, December 2018).

The study area and noise model area are equal to that adopted by the EIS noise assessment and as required by the Noise Criteria Guideline. They are defined by a 600 metre buffer adjacent to either side of the main project alignment. At the ends of the project a 'hard' edge is drawn which extends perpendicularly to the project alignments out to a distance of 600 metres. The study area defines the receivers that are assessed.

In addition, the study area has been expanded past the hard edge of the southern boundary of Stage 6 to include a small number of receivers in the study area of the Stage 4 consistency assessment (see *Consistency assessment report, Proposed changes between Mersey Road, Bringelly and Eaton Road, Luddenham* (Roads and Maritime, July 2018)). As explained in the Consistency Assessment, this is because the vertical alignment changes that occur between the Stage 4 and Stage 6 noise models could not be accurately assessed until the Stage 6 design was complete. At the time of the Stage 4 Consistency Assessment the Stage 6 design was incomplete so the new bypass section of The Northern Road could not be modelled as a continuous section of road. The new bypass section of The Northern Road can now be modelled as a continuous section of road and so the Stage 6 assessment study area has been expanded to include the potentially affected receivers in the Stage 4 assessment study area.

Four Noise Catchment Areas (NCAs) identified in the EIS are in the current study area: NCA02, NCA03, NCA04 and NCA05. No new NCAs were required for the assessment.

Operation

Generally, the revised horizontal alignment either exactly follows the SPIR and Final EIS alignment or the lanes have been shifted towards the overall centre line of the design. However, the proposed removal of the bridge over Adams Road reduces levels in the vertical alignment of The Northern Road, and increases levels in the vertical alignment of Adams Road to form the at-grade signalised intersection at Adams Road.

Noise level change summary

The current revised design operational noise predictions have been compared against those for the EIS. The findings of the noise modelling indicate that:

- On average the proposed design changes noise levels by -0.1 dB during the day and +0.1 dB during the night compared to the EIS design.
- The majority of the receivers, 96.8 per cent (day) and 85.3 per cent (night) show a noise level change ≤0.2 dB.
- Up to 3.2 per cent of the receivers show small noise level increases of between 0.2 and 1.2 dB during the day.

- Up to 14.7 per cent of the receivers show small noise level increases of between 0.2 and 1.5 dB during the night.

Overall, the noise level predictions between the revised alignment including all proposed design changes as described in Section 2.1, and SPIR and Final EIS alignment are similar. Therefore, it is expected that the noise impact outcomes / mitigation will be comparable as a result.

Maximum noise levels

No significant changes between the SPIR and Final EIS design and the proposed minor design changes have been identified with respect to maximum noise level events and sleep disturbance. Therefore, the assessment of maximum noise levels completed during the EIS is considered sufficient.

4.3.4 Mitigation / management

The results of the operational noise assessment indicate that three receivers previously identified as eligible for architectural treatment in the SPIR and Final EIS no longer exceed the criteria threshold for additional mitigation. Five additional receivers previously not identified in the SPIR and Final EIS as eligible for architectural treatment now exceed the criteria threshold for additional noise mitigation. These receivers are presented in Table 4-2 and shown in Appendix D of the construction and operational noise assessment provided in Appendix B of the *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham* (Roads and Maritime, December 2018).

Architectural treatments are committed to all the receivers identified in the SPIR and Final EIS assessment. That is, architectural treatment would be provided to the five additional receivers that exceed the criteria threshold for additional noise mitigation and still be provided to the three receivers that no longer exceed the criteria threshold for additional noise mitigation. The mitigation requirement for architectural treatment at all other receivers is the same as identified in the EIS. This means the combined SPIR and Final EIS and current revised design assessments result in a total of 26 receivers that qualify for architectural treatment.

Table 4-2 Summary of changes to receivers qualifying for architectural treatment

Noise Catchment Area	Address	Noise level difference between current and SPIR and Final EIS design		Qualify for architectural treatment	
		Daytime	Night time	SPIR and Final EIS design	Current revised design
NCA02	2778-2828 The Northern Road, Luddenham	1.1	1.5	N	Y
NCA04	2422-2430a The Northern Road, Luddenham[1]	0.1	0.4	N	Y
NCA04	151 Adams Road_1, Luddenham	-0.9	-0.8	N	Y

[1] Address cannot be verified through online mapping services. Precise coordinates and location of receiver provided in Appendix D and E of the construction and operational noise assessment.

Noise Catchment Area	Address	Noise level difference between current and SPIR and Final EIS design		Qualify for architectural treatment	
		Daytime	Night time	SPIR and Final EIS design	Current revised design
NCA05	2292 The Northern Road_1, Luddenham	0.2	0.3	N	Y
NCA05	2215a The Northern Road, Luddenham	0.2	0.3	N	Y
NCA03	2859 The Northern Road_1, Luddenham	-0.1	0.2	Y	N
NCA05	Luddenham Public School_3	-0.6	-0.6	Y	N
NCA05	Luddenham Public School_1	-0.7	-0.6	Y	N

Since the noise impacts and mitigation requirements are typically comparable between the SPIR and Final EIS and the proposed design (incorporating all design changes described in Section 2.1), no further consideration of additional noise mitigation is required.

The project satisfies the requirement of Condition E36 of the NSW Minister's Conditions of Approval.

4.4 Biodiversity

4.4.1 Introduction

As outlined in Section 2.1, the proposed changes to the project would result in minor changes to the project's construction and operational footprint. These changes (inclusive of the proposed minor changes together with the proposed modification) have been considered against the outcomes of the biodiversity assessment that was carried out for the SPIR and Final EIS.

4.4.2 Existing environment

Vegetation communities and threatened species are shown in relation to the proposed project construction footprint in Figure 4-1.

The construction of the proposed intersection at Adams Road requires an additional area of construction footprint. Within this area there are a number of artificial wetlands, specifically farm dams, and a second order intermittent stream. Minor increases to the construction boundary are also required to allow private property access adjustments. Within these areas there are small areas of vegetation grassy woodland. Vegetation zones and plant community types within the proposed additional construction footprint are described in Table 4-3.

Table 4-3 Vegetation zones present within the footprint of the proposed changes

Vegetation zone	Plant Community Type (PCT)	Condition	Status (TSC Act)
8	Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Moderate/Good_Derived grassland	Critically Endangered Ecological Community Cumberland Plain Woodland in the Sydney Basin Bioregion
9	*Phragmites australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion	Moderate/Good_Other	Not part of an Threatened Ecological Community

Vegetation Zone 8 has been identified as part of the Cumberland Plain Woodland in the Sydney Basin Bioregion Critically Endangered Ecological Community (CEEC) under the TSC Act. Some areas of this vegetation zone meet the thresholds for the EPBC listed CEEC, however none of these areas occur within the area subject to impact within this report.

There are no other critically endangered ecological communities in the vicinity of the proposed design changes.

4.4.3 Impact assessment

Assessment methodology

The design refinements have resulted in changes to the construction and operational footprints, requiring a recalculation of the direct impacts of the project as assessed within the Biodiversity Assessment Report (BAR) and subsequently presented within the EIS and the SPIR and Final EIS.

The change to the construction footprint consists primarily of the additional area required for construction of the Adams Road intersection, and other increases to the construction boundary required to allow private property access adjustments are more minor. However, the vegetation impacts related to each have not been identified separately and are assessed together.

This Section provides a revised assessment of the impacts under the Framework for Biodiversity Assessment (FBA) including recalculation of landscape values, and reassessment of impacts to native vegetation, threatened species, and Matters of National Environmental Significance (MNES).

The biodiversity impacts of the project were assessed under the Threatened Species Conservation Act 1995 (TSC Act). The Biodiversity Conservation Act 2016 (BC Act) commenced on 23 November 2016 and subsequently repealed the TSC Act. The Biodiversity Conservation (Savings and Transitional) Further Amendment Regulation 2018 provides that the BC Act applies to the modification of an approval even if the approval was granted before the commencement of the BC Act. As such, the BC Act applies to the proposed modification, rather than to the minor design changes that are the subject of this consistency assessment. Therefore, while all design changes described in Section 2.1 are assessed together for this consistency assessment under the FBA, implications of the amended regulations are discussed in the *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham* (Roads and Maritime, December 2018).

Landscape values

Alteration to the proposed construction footprint can alter the landscape value assessment carried out according to the Framework for Biodiversity Assessment (FBA) (NSW Office of Environment and Heritage, 2014).

Alteration to the proposed construction footprint has resulted in the need for recalculation of landscape value components applicable to linear shaped developments including:

- Percent extent of native vegetation cover in the landscape
- Area to perimeter ratio.

The connectivity value and patch size calculations in the SPIR and Final EIS remain valid with the design change and therefore no recalculation was required.

The revised percent extent of native vegetation cover in the landscape and area to perimeter ratio calculations were undertaken using ESRI ArcGIS software. To undertake the revised assessment of landscape values, a 550 metre buffer was established from the outside edge of the revised construction footprint. While this is a linear road project there are some detached construction compounds which made using a buffer from the centreline problematic.

Percent Native Vegetation Cover

Once the native vegetation cover was digitised, the extent of native vegetation in the landscape before and after the development was recalculated based on the revised construction footprint (see Table 4-4). The 550 metre landscape buffer is 2,675.85 hectares in size. Current percent native vegetation cover is estimated at 12 per cent (score 2.5 as outlined in Table 16 of Appendix 5 of the FBA). After the development, percent native vegetation cover is estimated at 11 per cent (score 2.5). The score for percent native vegetation cover is 0 as no change in category is predicted.

There is no change in score for percent native vegetation cover from that assessed in the SPIR and Final EIS.

Table 4-4 : Percent native vegetation cover in the landscape before and after development

	Before development	After development
Assessment buffer (550m from the edge of the construction footprint)	2,675.85 ha	2,675.85 ha
Native vegetation cover (ha)	326.73	285.77
Cover (%)	12 (score 2.5)	11 (score 2.5)
Score for % native vegetation cover in the development footprint buffer		**0**

Area to Perimeter Ratio

For a major project that is a linear shaped development or multiple fragmentation development, the change in area to perimeter ratio of patches impacted must be assessed.

The total area (square metres) and perimeter (metres) of vegetation patches impacted by the revised development within the 550 metre buffer is outlined in Table 4-5. The area to perimeter ratio before the development is 24 and after development is 21. The proportional change in area to perimeter ratio as calculated by the credit calculator is 12.5 and the score for the proportional change in area to perimeter ratio is 2 according to Table 19 in Appendix 5 of the FBA (see Table 4-5).

There is no change in score for area to perimeter ratio from that assessed in the SPIR and Final EIS.

Table 4-5 : Area to perimeter ratio of vegetation patches before and after development

	Before development	After development
Vegetation area (m^2)	462,329.27	342,393.32
Vegetation perimeter (m)	19,653.96	16,340.50
Area to perimeter ratio (whole number)	24	21
Proportional change		**12.5**

	Before development	After development
Score		**2**

Landscape Value Score

As noted above, the connectivity value and patch size calculations remain valid with the design change therefore no recalculation was required for these. There is a small increase in native vegetation removal from the current revised design but this is not large enough to cause a change in score for the landscape assessment of percent native vegetation cover. Likewise, the area to perimeter ratio does not change from that assessed in the SPIR and Final EIS.

The overall landscape score is 17. The landscape component scores are as follows:

- Percent native vegetation cover = 0
- Connectivity value class = 2.5
- Area / perimeter ratio score = 2
- Average patch size score = 12.5.

Removal of native vegetation

The SPIR and Final EIS indicates that the construction footprint would impact on up to about 40.79 hectares of native vegetation. The proposed changes would result in the removal of an additional 0.27 hectares of native vegetation from the following vegetation zones:

- Vegetation Zone 8, the Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion (Derived Native Grassland) (0.03 hectares)
- Vegetation Zone 9, the *Phragmites australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion plant community type (0.24 hectares).

Vegetation Zone 8 has been identified as part of the Cumberland Plain Woodland in the Sydney Basin Bioregion Critically Endangered Ecological Community (CEEC) under the TSC Act. Some areas of this vegetation zone meet the thresholds for the EPBC listed CEEC, however none of these areas occur within the area subject to impact within this report.

The overall impact to the critically endangered Cumberland Plain Woodland in the Sydney Basin Bioregion ecological community has increased slightly by 0.03 hectares due to a small change in the footprint in an area of Derived Native Grassland. This change is not substantial.

There is no change to the impact to the River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions endangered ecological community.

Removal of threatened fauna species habitat and habitat features

The additional impact to Vegetation Zones 8 and 9 will not increase the impacts of the project on the Cumberland Plain Land Snail or Regent Honeyeater (the two species credit fauna species for which offsets are required in the SPIR and Final EIS). Vegetation Zones 8 and 9 do not provide suitable habitats for these two threatened species.

Removal of threatened plants

The additional impact to Vegetation Zones 8 and 9, will not increase the impacts of the project on *Pultenaea parviflora* or the *Marsdenia viridiflora* subsp. *viridiflora* population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas (the two species credit flora species for which offsets are required in the SPIR and Final EIS). Vegetation Zone 8 and 9 do not provide suitable habitats for these two threatened species.

4.4.4 Impact to Matters of National Environmental Significance

Listed ecological communities

There is no additional impact to the critically endangered Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community.

While there is a small increase in impacts to Vegetation Zone 8, the vegetation does not form part of the EPBC Act listed Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community.

The impacted Derived Native Grassland in this area is an isolated patch that does not have connectivity to large native vegetation remnants so does not fall under the condition thresholds for this community.

Listed threatened flora species

There is no additional impact to *Pultenaea parviflora* from the proposed changes.

Listed threatened terrestrial fauna species

Vegetation Zones 8 and 9 do not provide suitable habitats for the following four threatened species listed on the EPBC Act that were identified in the SPIR and Final EIS:

- Grey-headed Flying-fox
- Regent Honeyeater
- Swift Parrot
- Large-eared Pied Bat.

Therefore, the additional impact to Vegetation Zones 8 and 9 will not increase the impacts of the project on these threatened species.

4.4.5 The environment of Commonwealth land

The proposed changes and the identified biodiversity impacts do not involve Commonwealth land.

4.4.6 Mitigation / management

The current mitigation measures for biodiversity outlined in the SPIR and Final EIS are comprehensive and cover all potential impacts as identified in the EIS. The mitigation measures for biodiversity were taken from the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (NSW Roads and Traffic Authority, 2011). The additional removal of 0.27 hectares of vegetation due to the proposed changes is covered by the mitigation measures provided in the SPIR and Final EIS. No new mitigation measures are required for the proposed changes.

The Infrastructure approval under Section 5.19 of the EP&A Act outlines a condition that during vegetation clearing, timber and root balls must be retained where practicable for reuse in habitat enhancement and rehabilitation work. The retained timber and root balls may be used on or off the CSSI site. Prior to the commencement of vegetation clearing, the Proponent must consult with community groups, the Mulgoa Valley Landcare Group and relevant government agencies to determine if retained timber and root balls could be used for environmental rehabilitation projects, before pursuing other disposal options.

The current mitigation measures outlined in the SPIR and Final EIS prescribe separation of woody vegetation to identify suitable items for secondary re-use according to the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (NSW Roads and Traffic Authority, 2011).

Offsetting

The Infrastructure approval under Section 5.19 of the EP&A Act and the Commonwealth approval include conditions that relate to biodiversity centre around offsets. Notably, NSW Minister's Conditions of Approval E2 and Condition 3 of the Commonwealth approval require Roads and Maritime to develop a Biodiversity Offset Strategy (BOS), and then to submit for approval, a Biodiversity Offset Package, consistent with the BOS.

Although the additional impact is a small change, the change will alter the offset requirement for the project. The required offset for HN630 (*Phragmites australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion) and HN529 (Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion) plant community types would increase from the credits required as outlined in the SPIR and Final EIS. Roads and Maritime are currently working in consultation with OEH to determine the quantum of offsets or supplementary measures that are required for the project. The final offset requirement for the Project would be determined during development of the BOS and offset package in consultation with the OEH. All offsets required will be provided to meet the conditions of approval.

Any supplementary measures identified in consultation with NSW OEH would be incorporated into the final BOS and BOP.

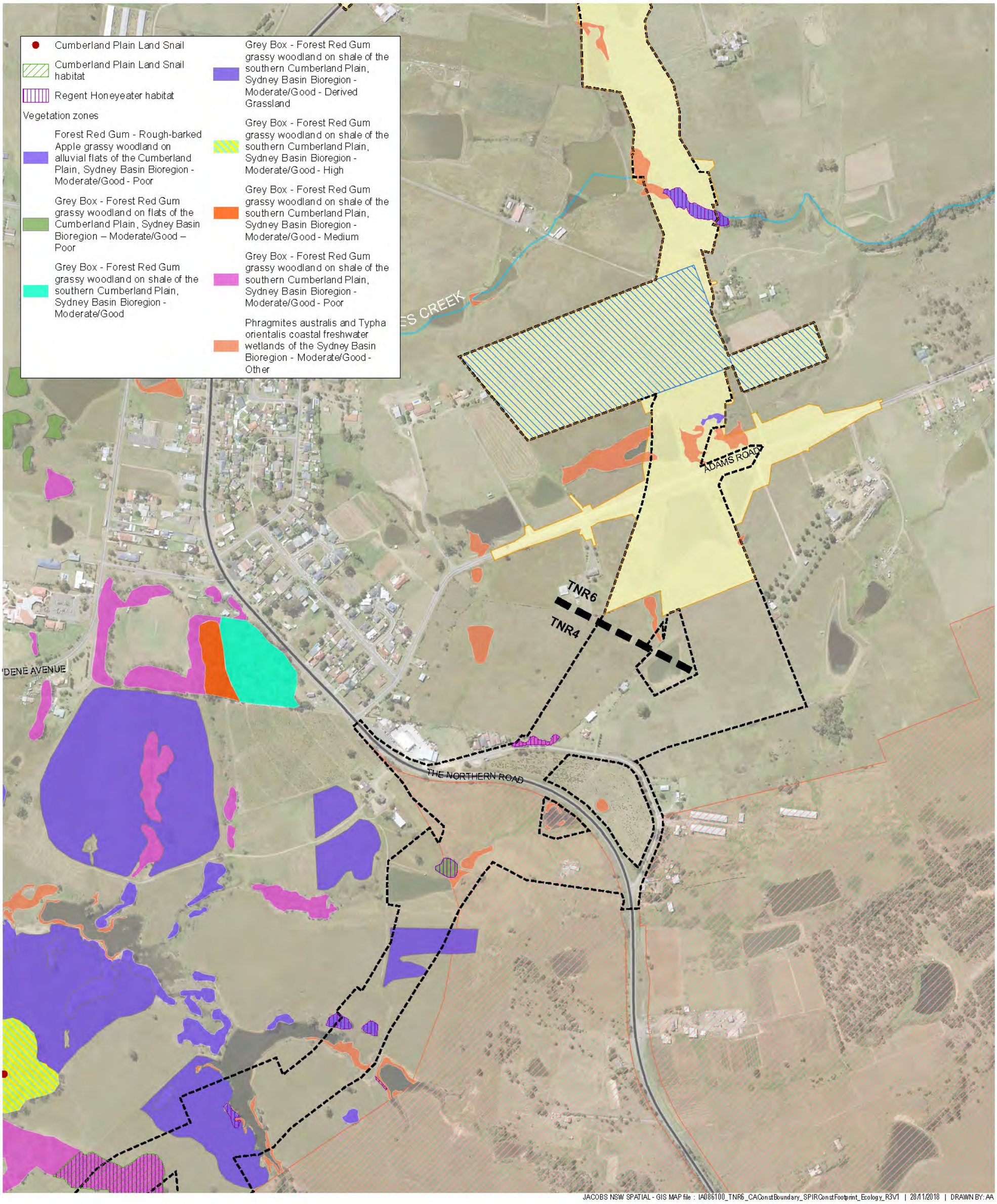
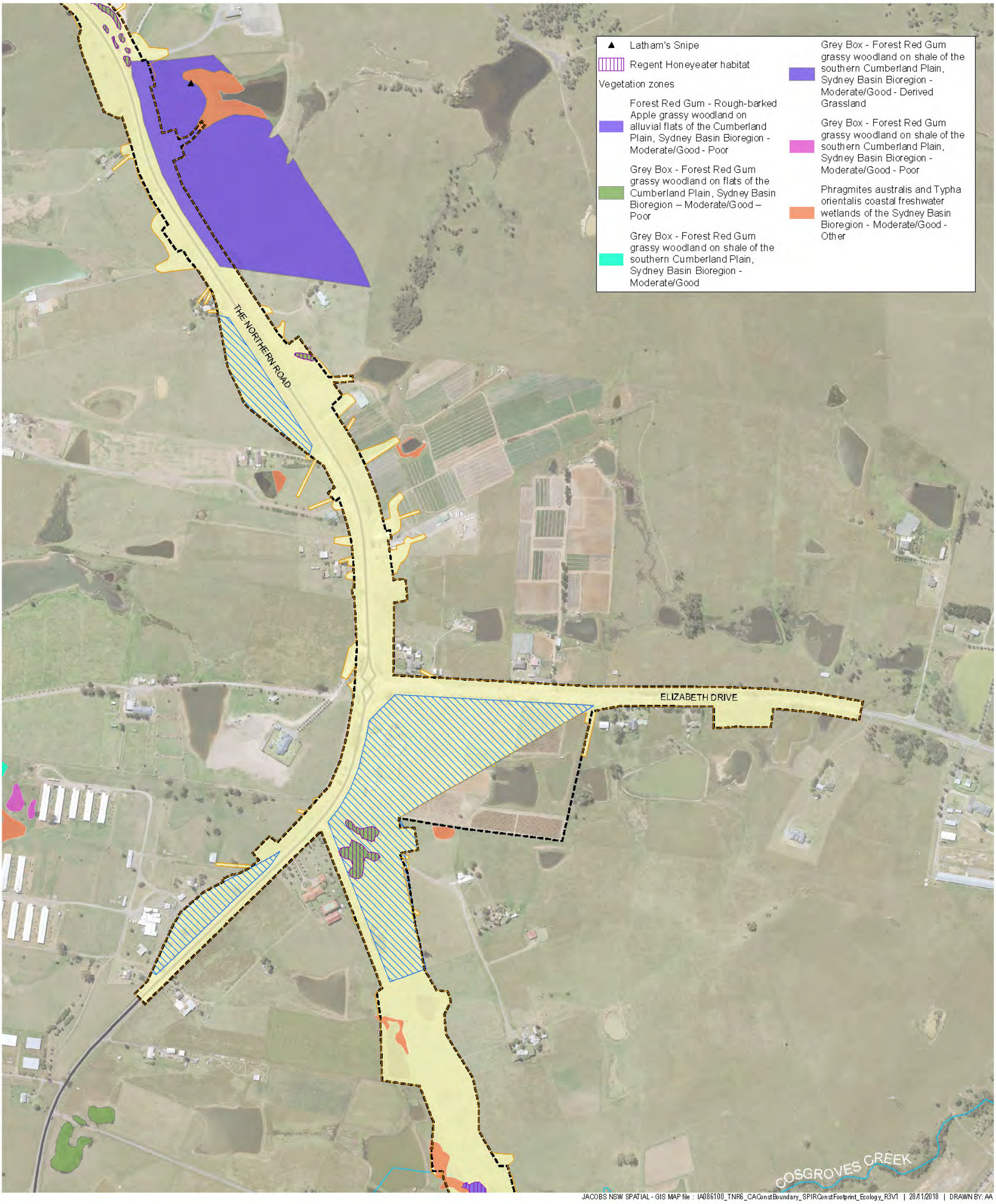


Figure 4-1 Vegetation communities and threatened species



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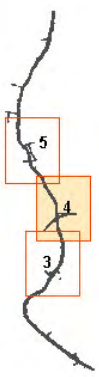
Legend

- Submissions design construction footprint
- Consistency assessment boundary
- Construction compound sites



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The Northern Road upgrade -
Mersey Road to Glenmore Parkway
Construction Boundary - Ecology

Figure 4-1 Vegetation communities and threatened species

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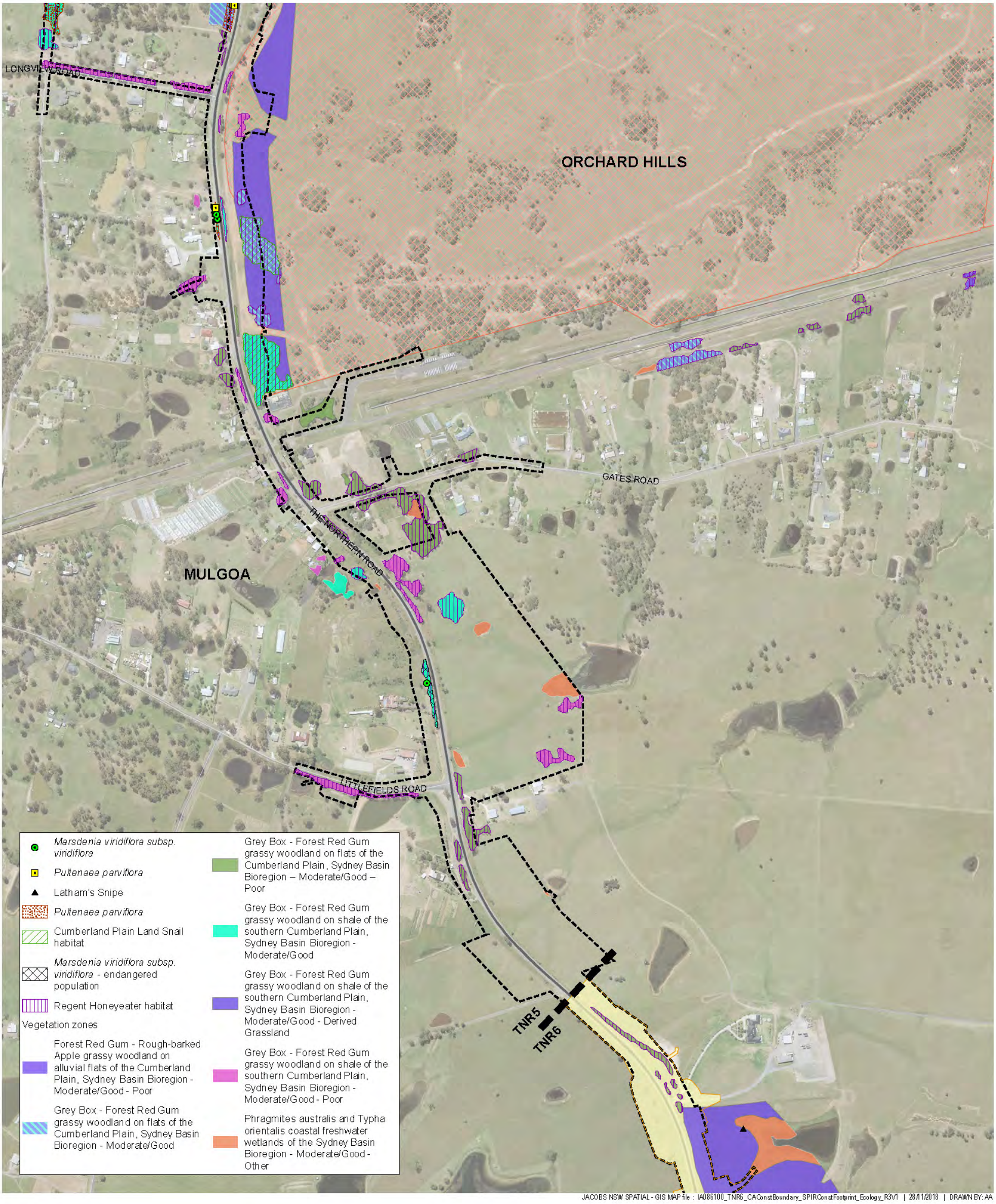


Figure 4-1 Vegetation communities and threatened species

4.5 Hydrology and flooding

4.5.1 Introduction

This Section describes the environmental values relating to hydrology and flooding and identifies potential impacts to these values as a result of construction and operation of the proposed changes to the approved project. This chapter also recommends environmental management measures to reduce the impacts to and of the project. The potential impacts of the approved project were described in Section 8.1 of the EIS.

4.5.2 Existing environment

The approved project and proposed changes fall within the catchment areas of a number of waterways and drainage lines including Cosgroves Creek, Mulgoa Creek, and an unnamed tributary of South Creek, as described in the SPIR and Final EIS. A summary of existing flood behaviour for these catchments is provided in Table 4-6.

Table 4-6 Summary of existing flooding behaviour

Catchment	Summary of existing flood behaviour
Cosgrove Creek catchment	Depths of ponding exceed 1 metre in the various farms dams, flow in the various drainage lines between each water storage is generally relatively shallow for events up to 100-year Average Recurrence Interval (ARI). There are also no existing dwellings that are presently impacted by flooding for events up to the Probable Maximum Flood (PMF). High hazard flooding is generally confined to the farm dams and the incised reaches of the drainage system which are typically located downstream of the project corridor for events up to 100 year ARI.
Mulgoa Creek catchment	Flooding is limited to catchment runoff ponding along the upslope side of the road. It is noted that drainage swales have been constructed along the western side of the road corridor in the vicinity of the Chain-O-Ponds Road intersection, along which several pipes are located where it is crossed by local access driveways.
Unnamed tributary of South Creek Catchment	Flooding is limited to catchment runoff ponding along the upslope side of the existing The Northern Road adjacent to the inlet of the existing transverse (or cross road) drainage structure.

4.5.3 Impact assessment

Design checks have been carried out to compare and check the consistency of the design exhibited in the EIS and the proposed design changes:

- The transverse drainage was checked by:
  - comparing culvert locations, types and dimensions
  - remapping of the catchments contributing to each structure and comparison of those areas
  - re-running of the TUFLOW model for the section of the main alignment where it runs through the Cosgroves Creek catchment to confirm that flooding conditions were not exacerbated in existing development located downstream of the road corridor
- The pavement drainage was checked by:
  - comparing outlet locations with those shown in the EIS
  - remapping of the catchments draining to outlets and comparing with the areas shown in the EIS
  - comparing the peak flows at the outlet of the pavement drainage lines north of Elizabeth Drive with those presented in the SPIR and Final EIS

- Catch drain types, lengths and locations were checked against the SPIR and Final EIS design
- The lengths of scour protection at the inlets and outlets of transverse drainage structures have been compared against the SPIR and Final EIS design.

The potential impacts of the project on flooding behaviour and the scour potential within receiving drainage lines has been considered during the detailed design phases of the project. Detailed flood modelling has also been carried out to identify the potential residual flooding and drainage related impacts of the project following the incorporation of a preferred set of transverse drainage upgrade and flood mitigation measures into the detailed design.

Figure A1, A2, A3 and A4 in Appendix C of the *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham* (Roads and Maritime, December 2018) show the impact the project would have on flooding behaviour, while Figure A5, A6 and A7 and A8 show the difference between the results of the flood modelling that was undertaken as part of the EIS and the current assessment for storms with ARI's of 2, 10 and 100 years, as well as the Probable Maximum Flood (PMF) in the Cosgroves Creek catchment.

By inspection of Figures A1 to A8, the impacts of the project (with the proposed design changes) on flooding behaviour in the Cosgroves Creek catchment would generally be the same as was assessed in the SPIR and Final EIS. By extension, the impact of the project on scour potential in the receiving drainage lines would also generally be the same as what was assessed in the SPIR and Final EIS.

The exception to the above finding is the area on the northern side of Adams Road, upstream of the project corridor. While the EIS assessed the removal of the existing farm dam at this location, the SPIR and Final EIS committed to it being retained. Measures have been incorporated into the proposed design changes to maintain the remnant portion of the farm dam. A rock lined spillway channel will be provided between the remnant portion of the farm dam and the inlet of the adjacent transverse drainage structure. The spillway channel has been sized to convey flows up to 1 per cent AEP in magnitude, while the rock lining will prevent it from scouring.

The locations where runoff from the project corridor will discharge to the receiving drainage lines is generally the same as was assessed in the EIS, even though the previously assessed kerb and gutter has been replaced by grassed swales at various locations. The only exception is along the northern side of Adams Road, west of its intersection with The Northern Road, where runoff from the eastbound lanes will sheet off the road into the nearby privately-owned dam. Given the relatively small paved area that will drain to the adjacent property, combined with the sheet flow nature of the flow, the discharge of runoff from Adams Road will not cause scour of the adjacent grassed area.

The difference to scour potential and runoff discharge location identified above is considered to be minor and overall the proposed changes are consistent with both the Division 5.2 Approval and the EPBC Approval.

4.5.4 Mitigation / management

The mitigation measures described in the EIS are sufficient to cover the potential impacts associated with the proposed changes.
The proposed changes do not change the meaning or outcomes of the 'Flooding and hydrology' conditions of the Division 5.2 Approval.

4.6 Soils, water and contamination

4.6.1 Introduction

This Section presents detailed assessment of potential impacts relating to surface water and contamination, which were previously assessed in Section 8.2 and Appendix L of the EIS, and Section 5.2.2 of the Final EIS and SPIR.

4.6.2 Existing environment

Surface Water

The proposed alignment crosses a number of farm dams and Cosgrove Creek, an intermittent stream that is a tributary of South Creek. There are no active Water Access Licences within 400 metres of the proposed alignment. The majority of watercourses in the vicinity of the project are ephemeral and most flow events occur in direct response to major rainfall, with no evidence of baseflow feeding any of the streams.

Contamination

The SPIR and Final EIS identified areas of environmental interest (AEIs) including filling, stockpiles, a market garden, a cemetery, service stations and dumped tyres. In order to identify any additional AEIs related to contamination associated with the either the proposed modification around the Adams Road intersection or the nearby property adjustment works comprising part of the minor design changes described in Section 2.1, a site inspection was conducted on 13 July 2018 by Jacobs environmental scientists. The site inspection focussed on the areas of additional construction footprint required for the Adams Road interchange, as well as adjacent land uses and potential AEIs. It was a non-intrusive, visual inspection only, carried out from areas that were accessible to the public.

At the time of the inspection, Adams Road was an asphalt sealed road with no formal kerb and guttering. The road verge comprises exposed soils and grass. The construction footprint of the Adams Road intersection (including property adjustment works considered as minor design changes in Section 2.1.1) and the surrounding areas comprised rural residential properties and general agricultural land use. Based on observations during the site inspection, the following AEIs were identified within or in close proximity to the extended construction footprint:

- Hummocky areas were located next to a dam wall on a private property to the south of Adams Road and maybe disturbed as part of construction activities. Hummocky areas maybe indicative of filling. The quality of the fill (if present) is unknown
- Small stockpiles of fill were located on a private property to the south of Adams Road and may be disturbed as part of construction activities. The quality of the material within the stockpiles is unknown
- General agricultural use of the regional area.

4.6.3 Impact assessment

Surface Water

Construction Phase

The previous construction drainage design assessed in the EIS, SPIR and Final EIS featured 13 sediment basins along the alignment. The current design features 22 basins covering 37 hectares of disturbed catchment area during the construction stage. The updated design also specifically includes an Erosion and Sedimentation Management Report and set of Plans to address issues regarding erosion and sedimentation during the construction stage, with local control locations proposed in areas that sediment basins cannot be feasibly included due to terrain constraints. The

Erosion and Sedimentation Management Report and Plans recommend construction practices to reduce the risk of erosion impacts during the works.

As such, the current plans for temporary construction phase sediment control is considered to be more robust and mature than the previous SPIR and Final EIS design and is considered to have improved upon impacts to water quality during the construction phase of the project (including the proposed changes).

Operational Phase Controls

The current operational drainage design proposed comprises 48 water quality controls (37 vegetated swales and 11 vegetated batter buffer areas) treating approximately 27.1 hectares of disturbed catchment area. The vegetated batter buffer controls have been utilised since changes to pavement drainage in various areas along the alignment has increased sheet flow runoff and decreased the effectiveness of swales.

The SPIR and Final EIS operational drainage design comprised 12 vegetated swales treating approximately 29.9 hectares of disturbed catchment area.

As per the SPIR and Final EIS design, there are no permanent water quality basins proposed.

A comparison of the total lengths of swales and catchment areas for the SPIR and Final EIS design and the current proposed drainage design is provided in Table 4-7. The revised design water quality control measures are shown in Figure 4-2.

Water quality modelling using the eWater Model for Urban Stormwater Improvement Conceptualisation (MUSIC) was carried out to determine the pollutant load reductions that can be achieved by the proposed controls for total suspended solids, total nitrogen and total phosphorus.

The MUSIC modelling estimated the pollutant load reductions of each of the 48 water quality controls proposed by the current revised design, and included any catchment areas that could not be feasibly treated due to terrain constraints. The results indicate that pollutant load reduction can be achieved as follows:

- Suspended Solids (TSS) (65 per cent to 97 per cent as compared with 22 per cent to 93 per cent in the SPIR and Final EIS)
- Total Phosphorous (TP) (47 per cent to 83 per cent as compared with 17 per cent to 68 per cent in the SPIR and Final EIS)
- Total Nitrogen (TN) (19 per cent to 100 per cent as compared with 5 per cent to 49 per cent in the SPIR and Final EIS)

The results indicate that the revised road geometry and drainage design would deliver a slight increase in water quality treatment effectiveness compared to that which was previously achieved by the SPIR and Final EIS design.

Table 4-7 Comparison of operational water quality controls in the SPIR and Final EIS and current design

Design	Total swale length (m)	Total buffer area (ha)	Total catchment area (ha)
SPIR and Final EIS design	1,005	-	29.9
Current design	4,020	1.848	27.1

Table 4-8 Annual average residual pollutant loads

Design	TSS (kg/yr)	TP (kg/yr)	TN (kg/yr)
SPIR and Final EIS design	9,550	27.2	274
Current design	9,422	25.7	234
Change	-1.3%	-5.4%	-14.5%

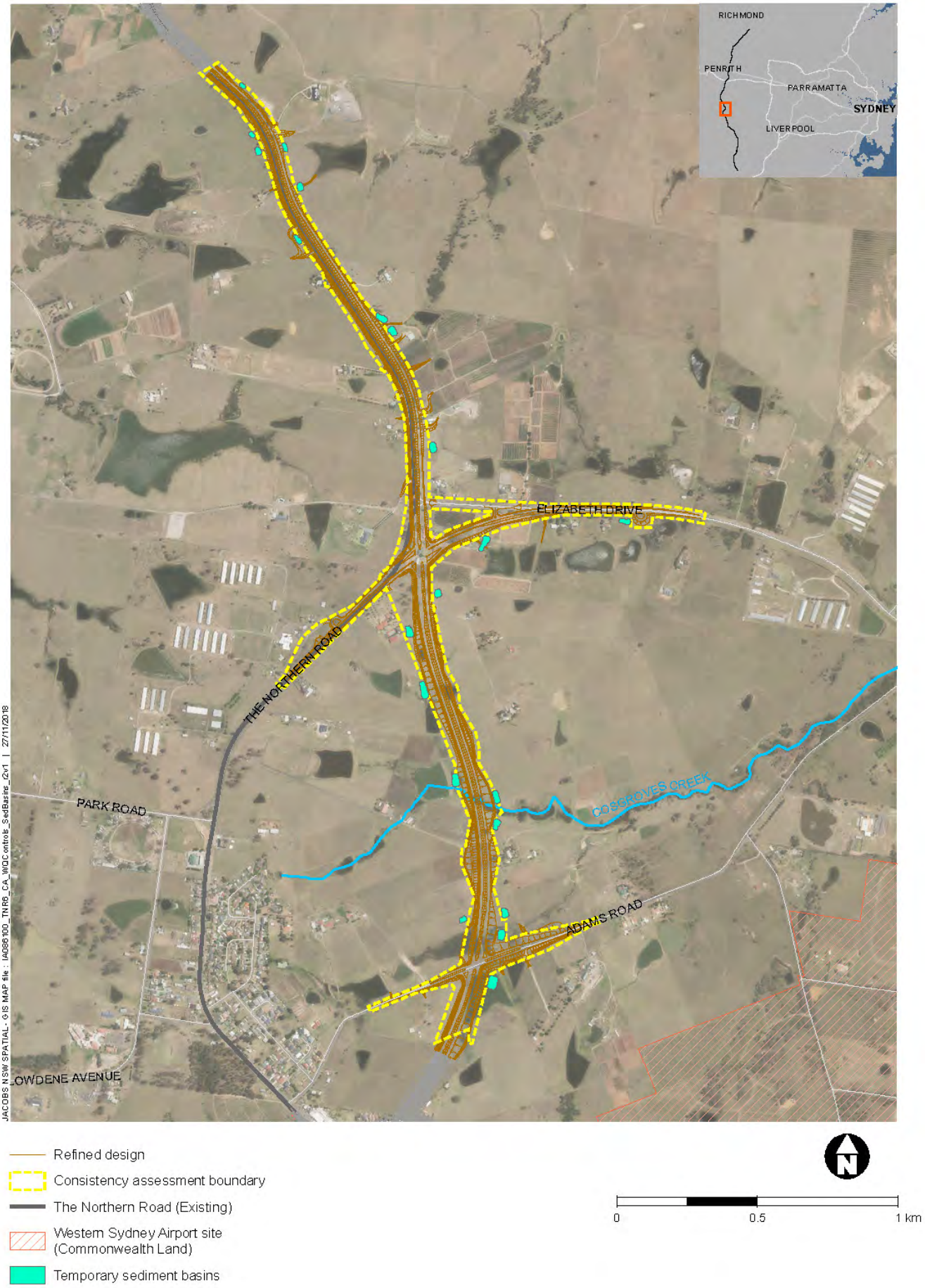


Figure 4-2 Proposed construction and operational water quality controls (Sediment Basins)
Page 1 of 2

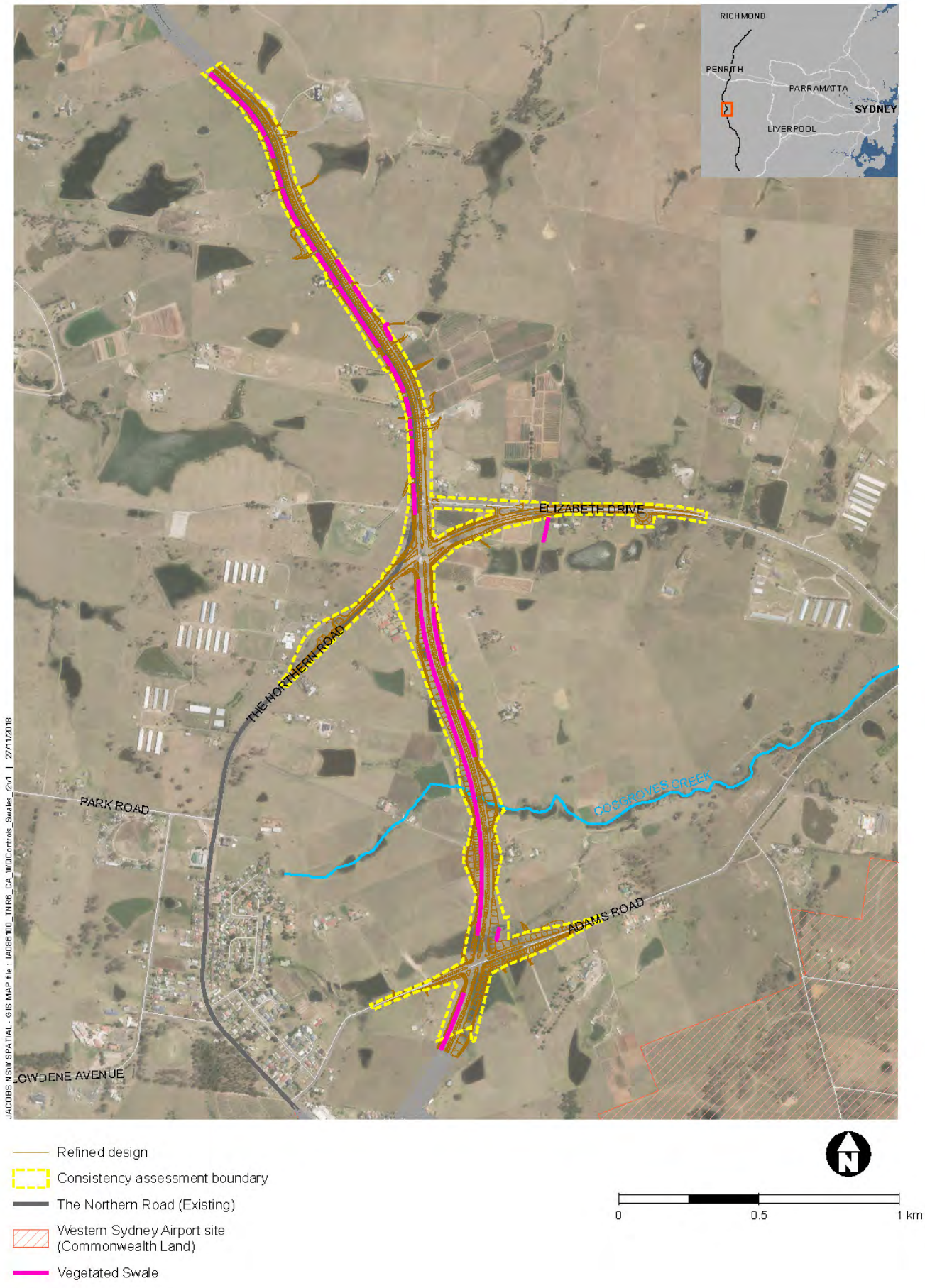


Figure 4-2 Proposed construction and operational water quality controls (Swales) Page 2 of 2

Contamination

The hummocky areas and small stockpiles of fill located to the south of Adams Road may be disturbed as part of construction activities for the minor design works and proposed modification.

The degradation of asphaltic road surfaces can contaminate surface soils with hydrocarbon compounds. The absence of formalised kerb and guttering along Adams Road may have caused asphalt to enter surface soils next to the road.

The widespread agricultural land use within and near the proposed additional construction footprint areas represent a potential source of contamination which could be exposed during construction activities. Contamination from agricultural activities is generally either point source (e.g. localised chemical storage and use, waste disposal) or diffuse (broad acre pesticide or herbicide application). The biggest risk of exposure to agricultural contamination would be associated with point sources. No agricultural chemical storage or waste areas (i.e. point sources) were observed within the additional construction footprint areas inspected.

The risk to environmental receptors and site users (construction workers involved with the road upgrade) associated with diffuse contamination from agricultural land use is low. This is a qualitative assessment and has not been confirmed or quantified through a sampling and analysis program.

Table 4-9 outlines the potential AEIs identified within and around the proposed intersection footprint and their associated risks to environmental receptors and site users (associated with the construction of the road upgrades). The risks have been assessed qualitatively. The potential risks have not been confirmed / quantified through a sampling and analysis program.

Table 4-9 Potential areas of environmental interest

AEI	Location	Contaminants	Potential Contamination Distribution	Exposure Risk
Filling	Private property, southern side of Adams Road	Heavy metals, hydrocarbons, pesticides, polychlorinated biphenyls, asbestos	Surface and shallow soils	Moderate – Filled areas may need to be disturbed during construction activities.
Stockpiles	Private property, southern side of Adams Road	Heavy metals, hydrocarbons, pesticides, polychlorinated biphenyls, asbestos	Surface and shallow soils	Moderate – Stockpiles may need to be disturbed during construction activities.
Deterioration of Asphalt	Areas next to Adams Road	Hydrocarbons	Surface soil	Moderate – Surface soils adjacent to Adams Road may need to be disturbed during construction activities.
Agricultural Land Use	Within and next to the proposed intersection	Heavy metals, hydrocarbons, pesticides, asbestos	Soils	Low – Contamination (if present) likely to be diffuse (no point sources observed).

4.6.4 Mitigation / management

Surface Water

The SPIR and Final EIS identified environmental management and mitigation measures that Roads and Maritime would adopt to avoid or reduce environmental impacts, in addition to design-related water quality controls (refer to Chapter 12 of the SPIR and Final EIS). An Operational Water Quality Management Plan would be established outlining monitoring and reporting requirements to confirm the effectiveness of water quality control measures and determine if any additional measures are required. No further environmental management measures have been identified due to the latest design refinements of the project.

The proposed changes would be carried out in accordance with the NSW Minister's Conditions of Approval E71 and E72.

Contamination

Based on the contamination assessment carried out, a number of moderate risk potential AEIs have been identified. Further investigations of these AEIs should be conducted to quantify the risk. These investigations should be carried out before construction activities so that contamination (if present) can be adequately planned for and managed.

The additional contamination assessment conclusions (risk profile) are consistent with those of the EIS, as are the recommended mitigation measures and management advice. The recommended mitigation measures and management advice as per the EIS is reiterated below and should be assumed to apply to the increased construction footprint of the current revised design.

Any further investigations should be carried out in accordance with NSW EPA endorsed guidance including the NEPM (2013) guidelines. The investigations should be designed in consideration of the potential contamination identified within this report and the proposed construction activities to be carried out for the proposed interchange (i.e. investigations should provide lateral and vertical coverage in context of the proposed construction activities across areas which are to be disturbed).

Should contamination be identified, appropriate remediation action plans and/or environmental management plans would be developed to remove or suitably reduce the contamination risks during construction activities.

Any soil/fill materials surplus to construction needs would be classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines*.

Where excavation works are required within low risk areas, a Construction Environmental Management Plan (CEMP) should detail contingency measures. These measures would manage potentially contaminated materials if materials are suspected and/or encountered during construction activities.

The proposed changes would be carried out in accordance with the NSW Minister's Conditions of Approval E46 to E50.

4.7 Urban design and visual impact

4.7.1 Introduction

Urban design and visual impacts were addressed in Section 8.5 and Appendix O of the EIS, and Section 5.2.2 of the Final EIS and SPIR. An additional urban design and visual impact assessment of all proposed changes described in Section 2.1 is provided in Appendix F of the *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham* (Roads and Maritime, December 2018) and summarised in this Section.

The proposed changes were reviewed against the urban design principles and objectives, and urban design directives (urban design vision, strategy and opportunities) detailed in the Landscape Character and Visual Impact Assessment (LCVIA) presented in Appendix O of the EIS.

4.7.2 Existing environment

The approved project is located in a rural setting around the periphery of the Western Sydney Airport. Between Eaton Road and Elizabeth Drive, the proposed upgrade runs along a new alignment, through agricultural and rural residential land. Of five Landscape Character Zones (LCZs) identified in the EIS, the proposed design changes influence two:

- LCZ3 Luddenham Plateau: characterised by a broad ridge with scenic panoramic views over a gently sloping pastoral landscape
- LCZ4 Cosgrove Creek: comprised of a rural valley surrounded by steep slopes leading up to the ridges of the surrounding Luddenham Plateau.

There are a large number of viewers in Luddenham that overlook the valley, including sensitive residential and recreation users.

The native vegetation within the study area generally consists of Cumberland Plain Woodland. It is highly modified as a result of past and current land uses, including agricultural uses which have resulted in significant clearing of the original vegetation. An ecological assessment of impacts to native vegetation is provided in Section 4.4 above. A number of farm dams also contribute to the character of the area.

4.7.3 Impact assessment

Urban design principles and objectives

A review of the current revised design (including all design changes described in Section 2.1) against the urban design objectives and principles outlined in the EIS was carried out as part of this assessment. The review indicated that the current revised design meets the urban design objectives and principles developed for the approved project. The key change to the design from the EIS is the replacement of the twin bridges at Adams Road with an at-grade intersection, which is considered to be an improved outcome from an urban design perspective.

A review of the modified design against the urban design strategy outlined in the EIS was also carried out as part of this assessment. The review indicated that the current revised design meets the overall urban design strategy developed for the project.

Landscape character impacts

The introduction of high embankments and increased road infrastructure on Adams Road results in locally increased landscape character impacts. However, as the landscape character impact rating identified in the EIS for these LCZs was high to moderate for LCZ3 and high for LCZ4, there has been no significant change in the impact overall.

4.7.4 Visual impacts

Of the 19 viewpoints assessed in the EIS, eight are located within Stage 6 of the project and were re-assessed with respect to the current revised design:

- Viewpoint 5: looking north-east into Cosgrove Valley from Wilmington Reserve on Jamison Street, Luddenham
- Viewpoint 6: looking west along Adams Road
- Viewpoint 7: looking south from private property driveway at 2901 The Northern Road
- Viewpoint 8: looking east at The Northern Road Luddenham, opposite the Park Road intersection

- Viewpoint 9: looking west from private property driveway at 2901 The Northern Road
- Viewpoint 10: looking west along Elizabeth Drive
- Viewpoint 11: looking south at the existing roundabout at the Elizabeth Road intersection at The Northern Road
- Viewpoint 12: looking west at 2776 The Northern Road.

No additional viewpoints were introduced as part of the assessment.

Photomontages were produced for viewpoints 5 and 6.

There would be no changes to the visible project elements as a result of the revised design from viewpoints 8 and 10. Whilst there are a number of proposed changes that would be perceptible from viewpoints 5, 7, 9, 11 and 12, the changes to the visual impact are assessed to be relatively minor in nature, given the overall scale of the project. The design changes have not altered the *magnitude* rating for these viewpoints. Visual *sensitivity* has also remained the same, resulting in no changes to the visual impact assessment of these viewpoints.

The visual impact of the proposed replacement of the twin bridges over Adams Road with an at-grade intersection is assessed by Viewpoint 6, looking west along Adams Road. The assessment outcomes of Viewpoint 6 are discussed in the *Modification assessment report, Proposed changes between Eaton Road, Luddenham and Littlefields Road, Luddenham* (Roads and Maritime, December 2018).

In summary, the visual impacts of the proposed design changes are consistent with those assessed in the SPIR and Final EIS.

4.7.5 Mitigation / management

The mitigation strategies outlined in the LCVIA developed for the EIS still apply for the proposed revised design. One additional mitigation measure is recommended as a result of the modified design, relating to the new embankments to be constructed along Adams Road east of the intersection.

4.8 Matters of national environmental significance

Under the environmental assessment provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, matters of national environmental significance (MNES) and impacts on Commonwealth land are required to be considered for the proposed changes.

There are no areas of Commonwealth land within the footprint of the proposed changes and no additional impacts (either direct or indirect) on Commonwealth land relating to the proposed changes. The proposed changes would not have any additional impacts on listed ecological communities, flora or fauna species identified within the EIS and the Final EIS.

Therefore, the assessment of proposed changes is consistent with the assessment as described in the Final EIS, in terms of impacts on MNES and Commonwealth land.

5 Consistency assessment - the Division 5.2 Approval

5.1 Minister's Conditions of Approval

The proposed minor changes described in Section 2.1.1 have been assessed in Table 5-1 in relation to the relevant Conditions of Approval.

Table 5-1 Consistency against relevant Minister's Conditions of Approval for the project

No.	Condition of Approval	Discussion	Consistent
A1	The CSSI must be carried out in accordance with the terms of this approval and generally in accordance with the description of the CSSI in the EIS as amended by the SPIR.	The proposed changes described in Section 2.1.1 of this report can be carried out in accordance with the terms of this approval and is generally in accordance with the description of the CSSI in the EIS as amended by the SPIR.	Yes
A2	The CSSI must be carried out in accordance with all procedures, commitments, preventative actions, performance criteria and mitigation measures set out in the EIS as amended by the SPIR unless otherwise specified in, or required under, this approval.	The proposed changes can be carried out in accordance with all procedures, commitments, preventatives actions, performance criteria and mitigation measures set out in the EIS as amended by the SPIR. No new mitigation measures are required as a result of the proposed changes.	Yes
E2	The Proponent must develop a **Biodiversity Offset Strategy** (BOS) to outline how the ecological values impacted by the CSSI will be offset in perpetuity. The BOS must be developed from the draft BOS detailed in the documents listed in **Condition A1** and include the threatened ecological communities identified in The Northern Road, Submissions and Preferred Infrastructure, Biodiversity Addendum technical memo (Jacobs, 26 October 2017). The BOS must be submitted for the approval of the Secretary within 12 months of the commencement of Construction or within another timeframe agreed with the Secretary.	Roads and Maritime will identify the offset requirement associated with the additional 0.27 ha of vegetation removal and incorporate this requirement in the final BOS. The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Condition of Approval	Discussion	Consistent
E3	Within 12 months of the approval of the BOS or within another timeframe agreed with the Secretary, the Proponent must develop and submit to the Secretary for approval, a **Biodiversity Offset Package**, consistent with the BOS approved under condition E2. The Package must be prepared in consultation with OEH and confirm how the impacts of the CSSI will be offset. The Package must be consistent with the biodiversity offset strategy requirements of the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014), unless otherwise agreed by OEH. The Package must include, but not necessarily be limited to: (a) identification of the number of biodiversity credits required to offset the impacts of the CSSI; (b) details on the biodiversity credits identified to offset the impacts of the CSSI and evidence that they can be attained and secured in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*; and (c) for offsets not secured through the retirement of biodiversity credits, details on the supplementary measures that would be implemented to offset the residual impacts, in accordance with Appendix B of the *NSW Biodiversity Offsets Policy for Major Projects* and the *Framework for Biodiversity Assessment* (OEH, 2014). (d) should supplementary biodiversity offset measures be proposed, the Biodiversity Offset Package must also provide details on the management and monitoring requirements for compensatory habitat works and other biodiversity offset supplementary measures proposed to ensure that outcomes of the package are achieved.	Roads and Maritime will identify the offset requirement associated with the additional 0.27 ha of vegetation removal and incorporate this requirement in the final BOS and Biodiversity Offset Package. The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
E4	All required offsets must be secured, in consultation with the OEH, within 12 months of the approval of the **Biodiversity Offset Package** or within another timeframe agreed with the Secretary. The Proponent must submit to the Secretary a copy of the **Credit Retirement Report** issued by the OEH once the offsets are secured, within one month of receiving the report.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
E5	During vegetation clearing, timber and root balls must be retained where practicable for reuse in habitat enhancement and rehabilitation work. The retained timber and root balls may be used on or off the CSSI site. Prior to the	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Condition of Approval	Discussion	Consistent
	commencement of vegetation clearing, the Proponent must consult with community groups, the Mulgoa Valley Landcare Group and relevant government agencies to determine if retained timber and root balls could be used for environmental rehabilitation projects, before pursuing other disposal options.		
E6	Measures identified in the documents listed in **Condition A1** to maintain or improve flood characteristics must be incorporated into the detailed design of the CSSI following consultation with adversely affected landowners and businesses, DoI Water, DPI Fisheries, SES and relevant Councils. These measures must be reviewed and endorsed by a suitably qualified person.	The design checks have indicated that the finalised drainage design for the project can be developed to ensure performance is consistent with the commitments of the SPIR and Final EIS. Consultation with affected landowners would be ongoing and the proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
E8	For property/ies where modelling in the documents listed in **Condition A1** predicts that the CSSI will potentially reduce the available stormwater runoff yield to a farm dam, the Proponent must, in consultation with the affected landowner: (a) calculate the nature and extent of impacts on water supply; (b) determine what measures may be implemented to prevent, mitigate or offset a loss in water supply; and (c) implement the measures agreed with the potentially affected landowner at no cost to the landowner. The agreed measures must be implemented before and during Construction of any works that may potentially affect the flow of water into the farm dams. In the event that the Proponent and the relevant property owner cannot agree on the measures to mitigate the impact, the Proponent shall engage a suitably qualified and experienced independent person to advise and assist in determining the impact and relevant mitigation measures.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Condition of Approval	Discussion	Consistent
E36	A review of the proposed operational noise mitigation measures for the CSSI must be undertaken by the Proponent. The review must be submitted to the Secretary for approval prior to commencing Construction which would affect the identified receivers, or within another timeframe agreed by the Secretary. The review must: (a) confirm the operational noise predictions of the CSSI based on detailed design. The operational noise assessment shall be based on an appropriately calibrated noise model (which has incorporated additional noise monitoring, where necessary for calibration purposes); (b) review the suitability of the operational noise mitigation measures identified in the documents listed in **Condition A1**. The review must take into account the detailed design of the CSSI and where necessary, refine the proposed measures with the objective of meeting the criteria outlined in the *NSW Road Noise Policy* (DECCW 2011), based on the operational noise performance of the CSSI predicted under (a) above; and (c) where necessary, investigate additional or alternative noise mitigation measures to achieve the criteria outlined in the *NSW Road Noise Policy* (DECCW, 2011).	The proposed changes have been incorporated into the operational noise assessment.	Yes
E37	Operational noise mitigation measures as identified in **Condition E36** (such as at-property architectural treatments) that will not be affected by construction works must be implemented within six (6) months of the commencement of Construction which would affect the identified receivers or within another timeframe agreed with the Secretary. These measures, and a schedule that outlines the timing for their delivery, must be detailed in the **Noise and Vibration CEMP Sub-plan** for the CSSI required by **Condition C4(b)**. Where early implementation of noise mitigation measures is not proposed, the Proponent must submit to the Secretary a report providing justification as to why, along with details of temporary measures that would be implemented to reduce construction noise impacts, until such time that the operational noise mitigation measures identified in **Condition E36** are implemented. The report must be provided to the Secretary for approval prior to the commencement of Construction which would affect the identified receivers.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Condition of Approval	Discussion	Consistent
E38	All operational noise mitigation measures identified in Condition E36 must be implemented prior to Operation.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
E60	The CSSI must be designed to retain as many trees as possible. The planting, retention and replacement of trees is to be carried out in accordance with the EIS. Trees removed during construction that are not within an endangered ecological community are to be replaced at a rate of two trees for every tree removed. Tree planting must occur within the CSSI boundary unless otherwise envisaged in the EIS, in consultation with the relevant council, or otherwise agreed by the Secretary.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
E61	Tree species selection is to be consistent with the plans and planting palette in the EIS. Pot sizes of selected tree species are to be consistent with part 3.2.1 (Rural road reserves) in the RMS Landscape Guideline (April 2008), subject to the long-term viability of the plant.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
E62	An **Urban Design and Landscape Plan** must be prepared based on the detailed design, and in accordance with the commitments made in the documents listed in **Condition A1**.	As per Section 4.7 above, the proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
E63	The **Urban Design and Landscape Plan** must incorporate monitoring and maintenance procedures for the built elements, rehabilitated and replacement vegetation and landscaping (including visual screening and weed control) and performance indicators, responsibilities, timing and duration and contingencies where rehabilitation of vegetation and landscaping measures fail.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
E64	The **Urban Design and Landscape Plan** must be finalised following consultation with the relevant Councils and the community. The Urban Design and Landscape Plan shall incorporate evidence of consultation on the proposed urban design and landscape measures and the monitoring and maintenance procedures.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Condition of Approval	Discussion	Consistent
E72	Drainage feature crossings (permanent and temporary watercourse crossings and stream diversions) and drainage swales and depressions must be designed and constructed in accordance with relevant guidelines and designed by a suitably qualified and experienced person in consultation with DPI Fisheries.	The drainage and water quality infrastructure associated with the refined design has been design in accordance with relevant guidelines.	Yes

The proposed changes as described in Section 2.1.1 can be accommodated within the NSW Minister's Conditions of Approval.

5.2 Statement of Commitments / environmental management measures

The proposed minor changes described in Section 2.1.1 have been assessed in Table 5-2 in relation to the relevant commitments / environmental management measures in the context of the Division 5.2 Approval.

Table 5-2 Consistency against relevant Statement of Commitments / environmental management measures

No.	Statement of Commitment / mitigation measure	Discussion	Consistent
NV-4	Where noise barriers and/or low noise pavements are not considered feasible and/or reasonable, noise impacts at affected dwellings would be mitigated by at property treatments.	The operational noise assessment carried out for the proposed changes indicate that three receivers previously identified in the SPIR and Final EIS as eligible for architectural treatment no longer exceed the criteria threshold for additional noise mitigation. However, in keeping with the SPIR and Final EIS commitments, architectural treatment would still be provided to these receivers. Five additional receivers previously not identified in the SPIR and Final EIS as eligible for architectural treatment now exceed the criteria threshold for additional noise mitigation. Architectural treatment would be provided to these five additional receivers. The mitigation requirement for architectural treatment at all other receivers is the same as identified in the SPIR and Final EIS.	Yes
B-2	Native vegetation removal would be minimised through detailed design.	The proposed changes would result in an additional 0.27 ha of vegetation removal. This change is minor and the impact would be generally in accordance with the impact outlined in the SPIR and Final EIS.	Yes

No.	Statement of Commitment / mitigation measure	Discussion	Consistent
B-7	Habitat removal would be minimised through detailed design.	The proposed changes would result in the removal of an additional 0.27 ha of vegetation. This vegetation does not provide suitable habitat for the threatened species identified in the SPIR and Final EIS. However, it may be used by other species that are not protected. This change is minor and the impact would be generally in accordance with the impact outlined in the SPIR and Final EIS.	Yes
B-12	Changes to existing surface water flows would be minimised through detailed design.	As per Section 4.5 above, the potential impacts of Stage 6 of the project on flooding behaviour and the scour potential within receiving drainage lines has been considered during the design phases of Stage 6 of the project and is ongoing as the design is finalised. Detailed flood modelling has been carried out to identify the potential residual flooding and drainage related impacts of Stage 6 of the project following the incorporation of a preferred set of transverse drainage upgrade and flood mitigation measures into the detailed design. The design checks have indicated that the finalised drainage design for the project is consistent with the commitments made in the SPIR and Final EIS.	Yes
B-24	Offsets requirements (including Biobanking credits and additional supplementary measures) would be delivered in accordance with a Biodiversity Offset Strategy and supplementary measures package for the project in consultation with OEH and DOEE.	The offset requirement associated with the additional 0.27 ha of vegetation removal will be incorporated in the final BOS and Biodiversity Offset Package. The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Statement of Commitment / mitigation measure	Discussion	Consistent
B-25	Shading and artificial light impacts would be minimised through detailed design. Measures to mitigate potential noise and vibration impacts are provided in Section 7.2 of the EIS.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
UD-1	The urban design and landscape concept developed for the project would be adopted during detailed design. This would include design treatments for: • Location and identification of existing vegetation and proposed landscaped areas, including species to be used • Built elements including retaining walls and Adams Road Bridge • Design' treatments for stormwater quality measures and infrastructure • Pedestrian and cyclist elements including footpath location, paving types and pedestrian crossings • Fixtures such as seating, lighting, fencing and signs • Details of the staging of landscape works taking account of related environmental controls such as erosion and sedimentation controls and drainage • Procedures for monitoring and maintaining landscaped or rehabilitated areas.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
UD-7	Development of the landscaping plan would include consultation with Council regarding its maintenance requirements	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Statement of Commitment / mitigation measure	Discussion	Consistent
FH-2	Appropriate scour protection measures would be implemented along any temporary drainage lines within the project construction area. Scour protection would be added to the outlets of the upgraded transverse drainage Scour protection measures would also be incorporated on the inlet of the upgraded transverse drainage in order to prevent damage to the structure during major flood events. Scour protection measures would take the form of dumped rock riprap or reno mattress.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
FH-5	The transverse drainage and flood mitigation strategy would continue to be refined during detailed design. If the properties are still impacted, and if mitigation is required, this would be investigated in consultation with the landowners. It would include but not be limited to: • Identification of potential flood impacts to the project and adjoining areas, including consideration of local drainage catchment assessments and climate change implications on rainfall, drainage • Design and mitigation measures to protect proposed operations and not worsen existing flooding characteristics during construction and operation, including soil erosion and scouring • Drainage system upgrades and preparation of a Flood and Emergency Management Plan.	The final drainage design for the detailed design is ongoing and can be developed to ensure performance is consistent with the commitments of the SPIR and Final EIS. The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Statement of Commitment / mitigation measure	Discussion	Consistent
FH-6	The 100 year ARI flood level is to be adopted in the assessment of measures which are required to mitigate any adverse impacts attributable to the project. Changes in flood behaviour under PMF conditions would also be assessed in order to identify impacts on critical infrastructure and substantial changes in flood hazards as a result of the project.	Detailed flood modelling for the 100 year ARI event and PMF event has been carried out to identify the potential flooding and drainage impact of Stage 6 of the project following the incorporation of a preferred set of transverse drainage upgrade and flooding mitigation measures. The assessment of hydrology and flooding is provided in Section 4.5.	Yes
FH-8	Consultation would be carried out with each affected landholder where reductions in the volume of flow would cause existing dams to fill less frequently, reducing the available yield.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
SWC-13	Water quality swales will be implemented for the proposal, including upstream of identified sensitive receiving waterways.	A total of 37 vegetated swales and 11 vegetated batter buffer areas are proposed as part of the refined design.	Yes

The proposed minor changes described in Section 2.1.1 are consistent with the environmental management measures incorporated as part of the Division 5.2 Approval.

5.3 Project objectives

The principle objectives of the Western Sydney Infrastructure Plan detailed within Section 3.4 of the EIS were not altered for the SPIR and Final EIS and include:

- Development and demand – support the Western Sydney Airport, lane use change and residential growth; balancing functional, social, environmental and value for money considerations
- Connectively to airport – provide a resilient connection to the Western Sydney Airport site for freight and people
- Integrated network – provide road improvements to support and integrate with the broader transport network
- Customer focus – provide meaningful engagement with customers and stakeholders throughout the program life.

The project specific objectives are outlined within Section 3.4 of the EIS and include:

- Realignment of The Northern Road around the Western Sydney Airport site to allow construction and facilitation of a Western Sydney Airport at Badgerys Creek
- Cater for future traffic demand to improve the flow of traffic to provide reliable journeys
- Improve transport connections to the Western Sydney Airport site and surrounding developments including the SWPGA (previously known as the South West Growth Centre) and WSPGA (previously known as the Broader Western Sydney Employment Area)
- Improve facilities for public and active transport to promote sustainable and efficient journeys.

The proposed changes support and are consistent with the program and project objectives.

5.4 Consistency questions – the Division 5.2 Approval

Table 5-3 presents a set of questions that assist Roads and Maritime to determine whether the proposed change can be considered consistent with the Division 5.2 Approval.

Table 5-3 Division 5.2 Approval consistency questions

Consistency question	Discussion	Consistent
1. Is the proposed change likely to result in changes to the scope and impacts of the project to an extent that would be considered a radical transformation of the project as a whole, as to be, in reality, an entirely new project?	The proposed change detailed in Section 2.1.1 of this report would not result in a significant change to the project as a whole. The impacts associated with the proposed changes would be managed in accordance with the management measures proposed in the SPIR.	Yes
2. Would any conditions of approval need to be amended in light of the change?	The proposed changes would not impact on the ability to comply with any of the conditions of approval. A review of the proposed changes against the conditions of approval is provided in Section 5.1.	Yes
3. Would the statement of commitments or	The proposed changes would not impact on the ability to comply with any of the	Yes

Consistency question	Discussion	Consistent
environmental management measures need to change?	environmental management measures identified in the SPIR. A review of the proposed changes against the environmental management measures is provided in Section 5.2.	
4. Would the proposed change be 'generally in accordance with' the documents incorporated in Standard Condition A1?	As described in Table 5-1, the proposed change is considered generally in accordance with the documents incorporated in Condition A1.	Yes
5. Would the environmental impacts of the project as a whole be altered by the proposed change to the extent that the proposed change would not be consistent with the Approval?	The environmental assessment detailed in Chapter 4 has found that the impacts are consistent with those impacts identified in the SPIR. These impacts can therefore be managed through safeguards identified in the SPIR.	Yes
6. Considering the project as a whole, would the magnitude of the change be viewed as consistent with the project?	The magnitude of the proposed change is negligible in comparison to the project as a whole. The proposed changes are consistent with the program and project objectives detailed in Section 5.3.	Yes

6 Consistency assessment - EPBC Approval

6.1 Commonwealth Minister's Conditions of Approval

Table 6-1 below addresses those Conditions of Approval relevant to the proposed minor changes in the context of the Commonwealth Approved Project.

Table 6-1 Consistency against relevant Commonwealth Minister's Conditions of Approval for the project

No.	Condition of Approval	Discussion	Consistent
1	The **approval holder** must undertake the action, including but not limited to those parts of the action that occur on Commonwealth Land, in accordance with all conditions in the **NSW Infrastructure Approval**.	The proposed change is consistent with the conditions in the NSW Development Consent as assessed in Section 5.1 of this report.	Yes
3	The nature and quantity of **offsets** required to address the impacts of the action on biodiversity are to be implemented as required by the **NSW Infrastructure Approval**, with the following additional requirements: (a) The **Biodiversity Offset Strategy** described in Condition E2 of the **NSW Infrastructure Approval** must be submitted to the **Minister** for approval within 12 months after the date of **commencement of the action**. If the **Biodiversity Offset Strategy** is not submitted to the **Minister** for approval within 12 months after **commencement**, all physical works must cease, unless otherwise agreed in writing by the **Minister**. (b) The **Minister** may, at any point after the **Department** receives submission of the **Biodiversity Offset Strategy**, provide written notice to the **approval holder** that the **Biodiversity Offset Strategy** is not adequate. The notice	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Condition of Approval	Discussion	Consistent
	may specify a time in which the **approval holder** must resubmit a revised **Biodiversity Offset Strategy**. If the revised **Biodiversity Offset Strategy** is not resubmitted within the period specified in the notice, the **approval holder** must not undertake any further works without the written agreement of the **Minister**. (c) In relation to Condition E3(c) of the **NSW Infrastructure Approval**, payment of funds into a statewide or multi-project biodiversity trust fund may not form part of an **offset** except with prior agreement in writing from the **Minister**. (d) Except as otherwise required by the **NSW Infrastructure Approval**, the **approval holder** may **commence the action** and undertake the action for 12 months after the date of **commencement** prior to securing any **offset**. (e) Once 12 months have passed since the date of **commencement**, the **approval holder** must not conduct any works further impacting a matter protected under Part 3 of the **EPBC Act** unless: a. the **approval holder** has secured **offsets** sufficient to compensate for all impacts that occurred during the first 12 months after **commencement**, and b. the **approval holder** has secured further **offsets** sufficient to compensate for each stage of impacts before that stage occurs. The **approval holder** may continue works without fulfilling the requirements of Conditions 3(e)a and 3(e)b of this approval if the **Minister** provides written agreement that works may continue. **Note:** an **offset** will be taken to be secured for the purposes of this condition if the **approval holder** has entered into a written in-principle agreement to with a relevant		

No.	Condition of Approval	Discussion	Consistent
	landholder or landholders to purchase **biodiversity credits** from land the **approval holder** reasonably believes will yield an **offset** sufficient to discharge the relevant degree of **offset** liability. (f) In addition to the requirements of Condition 3(e) of this approval, within 3 years after the date of **commencement**, the **approval holder** must provide the **Department** with a **credit retirement report** demonstrating to the **Department's** satisfaction that all **offsets** required under the **NSW Infrastructure Approval** are in place.		
7	No **waste** material generated outside the **DEOH** site may be used as soil, fill, or a component of soil or fill, within the boundaries of **DEOH** nor within 10 metres of the **DEOH** boundary, unless: **a)** the material is **Virgin Excavated Natural Material**, and **b)** the material is sourced from a location that appropriate testing demonstrates is free of weed propagules and/or *Phytophthora cinnamomi*. Details of the material source and testing undertaken must be provided to the **Minister** before the material is taken onto the **DEOH** site. The **Minister** may write to the **approval holder** at any time and advise that the **Minister** is not satisfied with the testing undertaken. If the **Minister** provides such advice, the **approval holder** must not source any further material from that site without the **Minister's** written agreement. Between 10m and 30m of the DEOH boundary, the **approval holder** is to make all reasonably practical efforts to ensure that material used is free of weed propagules and/or *Phytophthora cinnamomi*.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

No.	Condition of Approval	Discussion	Consistent
8	No **topsoil** material generated outside the **DEOH** site may be used as soil, fill, or a component of soil or fill, within the boundaries of **DEOH** nor within 30 metres of the **DEOH** boundary, unless: a) The approval holder can demonstrate the **topsoil** material is free from contaminants that would adversely affect the environment, and b) the **topsoil** material is sourced from a location that appropriate testing demonstrates is free of weed propagules and/or *Phytophthora cinnamomi*. Details of the **topsoil** material source and testing undertaken must be provided to the **Minister** before the **topsoil** is taken onto the **DEOH** site. The **Minister** may write to the **approval holder** at any time and advise that the **Minister** is not satisfied with the testing undertaken. If the **Minister** provides such advice, the **approval holder** must not source any further **topsoil** material from that site without the **Minister's** written agreement.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes
9	Any **mulch** material applied or stockpiled on land that will be inside the **DEOH** boundary fence once the action is completed, or on land that will be within 30 m of the **DEOH** boundary fence once the action is completed, must fulfil the requirements of the **Mulch Exemption** and the **Mulch Order** as if the **mulch** were being applied to an **environmentally sensitive area**.	The proposed changes to the project would not impact on the ability to comply with this requirement.	Yes

The proposed minor changes described in Section 2.1.1 can be accommodated within the EPBC conditions of approval.

6.2 EPBC Approval consistency questions

Table 6-2 presents a set of questions that assist Roads and Maritime to determine whether the proposed minor changes as described in Section 2.1.1 can be considered consistent with an EPBC Approval.

Table 6-2 EPBC Approval consistency questions

Consistency question	Discussion	Consistent
1. Would any conditions of the EPBC Approval need to be varied in light of the change?	No. Conditions relevant to the proposed change are identified in Section 6.1. None of these conditions would need to be varied as a result of the proposed change.	Yes
2. Would an approved action management plan required by a condition of approval need to be varied as a result of the proposed change?	No. There is no approved action management plan required by the EPBC Approval.	Yes
3. Would the proposed change constitute a 'new project' under the EPBC Act?	No. Chapter 4 of this report identifies the likely impacts associated with the proposed change. The proposed change would not impact on matters of national environmental significance or commonwealth land.	Yes

7 Conclusion

Based on the consistency assessment in this report, the proposed minor changes as described in Section 2.1.1 are considered:

- ☐ Consistent with the Division 5.2 Approval
- ☐ ~~Not consistent with the Division 5.2 Approval. A modification to the project approval must be prepared and submitted for approval by the Minister~~.
- ☐ Consistent with the EPBC Approval
- ☐ ~~Not consistent with the EPBC Approval. A written request to vary the condition/s of approval / approved action management plan must be prepared and submitted for approval by the Minister for the Environment / A new EPBC referral is required.~~
- ☐ ~~A radical transformation of the project and as such a new project should be developed with new and separate planning approvals obtained as necessary.~~

8 Other considerations

8.1 Permits, licenses and other approvals

There are no additional approval requirements or changes to any permits, licenses or other approvals as a result of the proposed change.

9 Certification

Author

This consistency assessment provides a true and fair review of the proposed minor changes to The Northern Road Upgrade – Mersey Road, Bringelly to Glenmore Parkway, Glenmore project as described in Section 2.1.1.

Name	Mark Terei	Signature	
Position	Environmental Planner	Date	03/12/18
Organisation	Jacobs		

Environmental Representative

I have reviewed the information contained within this consistency assessment and based on the information provided I agree that the proposed minor change as described in Section 2.1.1 are consistent with the Part 5.2 Approval and EPBC Approval.

Name	Cameron Weller	Signature	
Position	Lead Environment Representative The Northern Road Upgrade	Date	03/12/18

Roads and Maritime

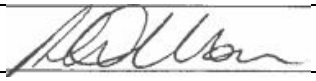
The proposed change, subject to the implementation of all the environmental requirements of the project, is consistent with the Division 5.2 Approval The proposed minor changes (as described in Section 2.1.1) subject to the implementation of all the environmental requirements of the project, are consistent with the EPBC Approval.

Name	Suzette Graham	Name	Kurt Bridde
Signature		Signature	
Position	Senior Environment Officer	Position	Project Manager
Date	03/12/18	Date	03/12/18

I have examined the proposed changes by reference to the Division 5.2 Approval in accordance with Section 5.25 of the EP&A Act and I have examined the proposed changes by reference to the EPBC Approval. I consider that the proposal is consistent with the Division 5.2 Approval and EPBC Approval.

I agree with the recommendations of the Roads and Maritime Senior Environment Officer and approve the carrying out the proposed changes in accordance with those recommendations.

Name	Anthony Eland
Signature	
Position	Roads and Maritime Environment Manager Western Sydney Project Office
Date	03/12/18

Name	Peter Williams
Signature	
Position	Roads and Maritime A/Director Western Sydney Project Office
Date	03/12/18

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Customer feedback
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