Bells Line of Road Chifley Road upgrade

Addendum review of environmental factors

Roads and Maritime Services | August 2018

NSW GOVERNMENT

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Executive summary

The proposed modification

Roads and Maritime Services (Roads and Maritime) proposes to modify the Bells Line of Road Chifley Road Upgrade project (proposed modification) by staging delivery, changing the project boundary and vegetation clearing extents and modifying the work methodology as it relates to an identified heritage item. Key features of the proposed modification would include:

- Delivery of the project in two stages being:
  - Stage 1: Replacement of the existing Clarence road over rail bridge, widening and realigning of approaches and improvements to the Clarence Colliery Road intersection with Chifley Road
  - Stage 2: Widening and realigning Chifley Road at Scenic Hill, provision of an additional descending lane and median barrier, improvements at the Lithgow Ex-Prisoner of War Memorial Tower intersection, and improved concrete drains along road cuttings
- Changes to the project boundary for Stage 1 arising from the detailed design process, including changes to native vegetation clearing
- Additional vegetation clearing within the nominated site compound for Stage 1
- Removal rather than covering of the eastern end of former railway embankment (heritage item CRC03) as this area is now in cut (not fill) and requires excavation to lay pavement.

Background

A review of environmental factors (REF) was prepared for the Bells Line of Road Chifley Road Upgrade project in September 2016 (referred to in this addendum REF as the project REF). The project REF was placed on public display between 28 September 2016 and 26 October 2016 for community and stakeholder comment. A submissions report, dated 22 December 2016 was prepared to respond to issues raised.

Need for the proposed modification

Chapter 2 of the project REF addresses the strategic need for the project and the project objectives. The proposed modification assessed in this addendum REF is consistent with the strategic need of the project.

The proposed modification is needed to allow the staged delivery of the project to align with available funding. It also addresses requirements arising from the detailed design and construction planning process, specifically:

- Removal of trees within the proposed site compound to allow safe access for large vehicles and plant
- Extension of the construction boundary at some locations to accommodate power pole relocations (with required clearance to vegetation), scour protection, access and new boundary fencing
- Reduction in the construction boundary at some locations to reflect the requirements of the final design
- Removal rather than covering of the eastern end of former railway embankment (heritage item CRC03) as this area is now in cut (not fill) and requires excavation to lay pavement.

Proposal objectives and development criteria

Section 2.3 of the project REF identifies the proposal objectives and development criteria that apply to the proposed modification. No additional criteria or objectives have been identified for the proposed modification.

Options considered

Roads and Maritime investigated the 'do nothing' option and one other option:

1. 'Do nothing' option – This option involves carrying out the project as described in the project REF, without any staging
2. Option 1 – This option involves implementing the project in two stages (Stage 1 Clarence Bridge and Stage 2 Scenic Hill), making adjustments to the project boundary, revising the extent of native vegetation clearing required and clarifying the type and extent of impact on railway embankment (heritage item CRC03).

The do nothing option does not address the identified need and would therefore only be preferred in circumstances where the costs and environmental impacts of proceeding were assessed as outweighing identified benefits. That was not the case and therefore the 'do nothing' option was not pursued further.

Option 1 was selected as the preferred option because it allows staging of the project to align with funding allocations and best reflects the detailed design in terms of construction extent and quantum of native vegetation clearing. The impacts of the proposed modification have been assessed and found not to be significant.

Statutory and planning framework

The proposed modification is categorised as development for the purpose of road and is being carried out by or on behalf of a public authority. Under clause 94 of the ISEPP the proposed modification is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Consent from Council is not required.

The proposed modification would be unlikely to cause a significant impact on matters of national environmental significance or the environment of Commonwealth land. A referral to the Australian Government Department of the Environment and Energy under the *Environment Protection and Biodiversity Conservation Act 1979* (EPBC Act) is therefore not required.

Community and stakeholder consultation

Given the minor nature of the proposed modification, further community consultation was not considered necessary. The updated timing for the Clarence Bridge and Scenic Hill components of the project has been communicated via the Roads and Maritime website.

Environmental impacts

Assessment of the potential environmental impacts associated with the proposed modification identified the following:

- The proposed modification would reduce overall native vegetation clearing for the project by 0.166 hectares to a total of 4.464 hectares
- The project, inclusive of the proposed modification, would not have a significant impact on Commonwealth or NSW listed threatened species, populations, endangered ecological communities or their habitats
- The detailed design (inclusive of the proposed modification) would have a beneficial effect on water quality, further reducing total suspended solids, total phosphorus, total nitrogen and gross pollutant loads when compared to the existing situation.
- The proposed removal, rather than burial of the eastern extent of locally significant heritage item CRC03 (former railway formation) would have minor impact on the significance of the item.

The consolidated lists of safeguards and management measures detailed in Table 7-1 of this addendum REF would apply to the proposed modification. The list includes additional measures to address potential biodiversity impacts associated with the proposed modification.

Justification and conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the addendum REF best meets the project objectives, but would still result in some minor additional impacts on non-Aboriginal heritage. Safeguards and management measures as detailed in this addendum REF would ameliorate or minimise these expected impacts. The proposed modification would also reduce overall native vegetation clearing and further reduce nutrient and pollutant loads when compared to the existing situation. On balance the proposed modification is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF and subsequent Submissions report and would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Department of the Environment and Energy is not required.

Tables

Figures

Appendices

1. Introduction

1.1 Proposed modification overview

Roads and Maritime Services (Roads and Maritime) proposes to modify the Bells Line of Road Chifley Road Upgrade project by (proposed modification) by staging delivery, changing the project boundary and vegetation clearing extents and modifying the work methodology as it relates to an identified heritage item. Key features of the proposed modification would include:

- Delivery of the project in two stages being:
  - Stage 1: Replacement of the existing Clarence road over rail bridge, widening and realigning of approaches and improvements to the Clarence Colliery Road intersection with Chifley Road
  - Stage 2: Widening and realigning Chifley Road at Scenic Hill, provision of an additional descending lane and median barrier, improvements at the Lithgow Ex-Prisoner of War Memorial Tower intersection, and improved concrete drains along road cuttings
- Changes to the project boundary for Stage 1 arising from the detailed design process, including changes native vegetation clearing
- Additional vegetation clearing within the nominated site compound for Stage 1
- Removal rather than covering of the eastern end of former railway embankment (heritage item CRC03) as this area is now in cut (not fill) and requires excavation to lay pavement.

The location of the proposed modification is shown in Figure 1-1 and the proposed modification is shown in Figure 1-2. Chapter 3 describes the proposed modification in more detail.

A review of environmental factors (REF) was prepared for the Bells Line of Road Chifley Road Upgrade project in September 2016 (referred to in this addendum REF as the project REF). The project REF was placed on public display between 28 September 2016 and 26 October 2016 for community and stakeholder comment. A submissions report, dated 22 December 2016 was prepared to respond to issues raised.

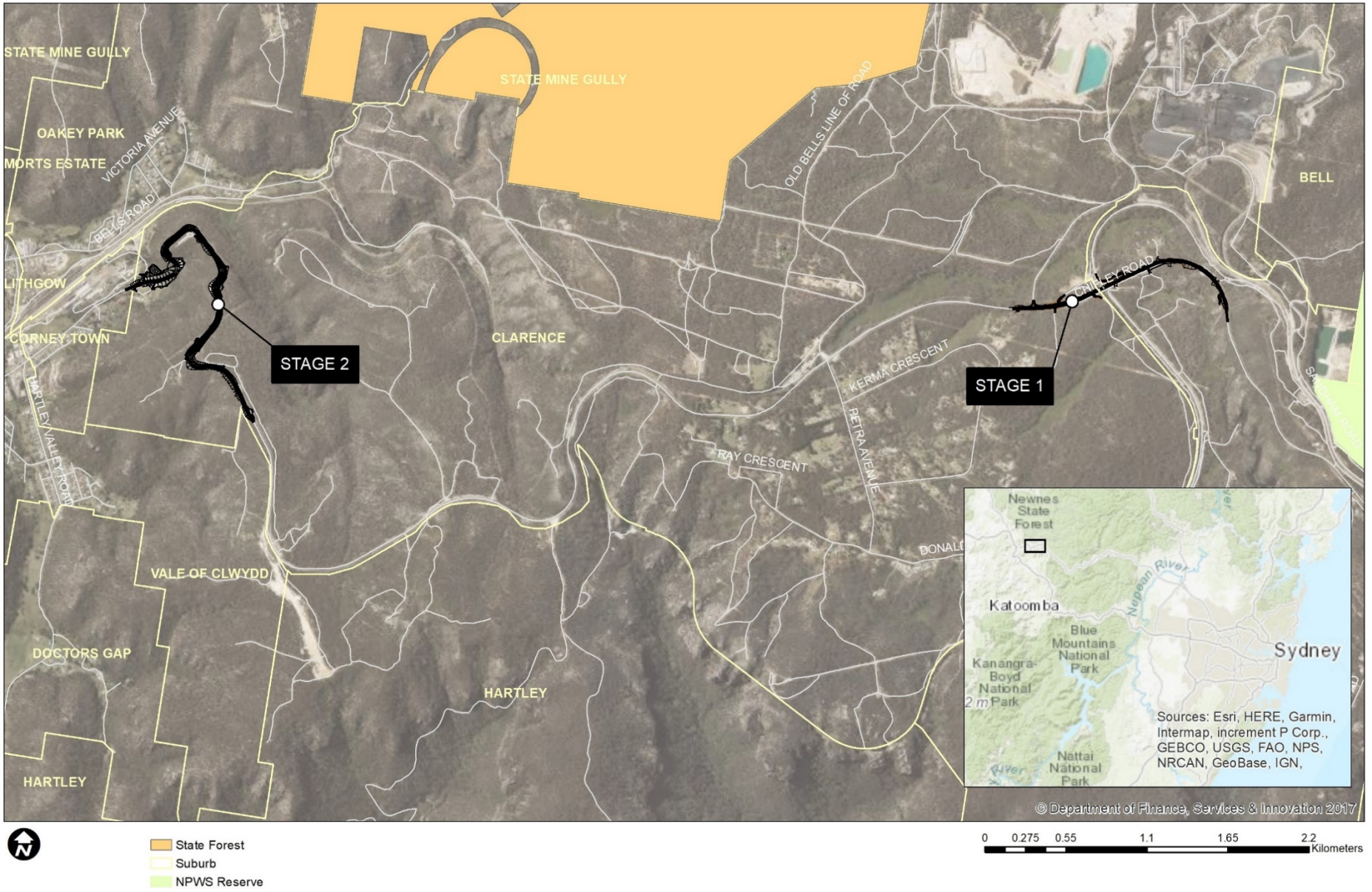

Figure 1-1: Location of the proposed modification

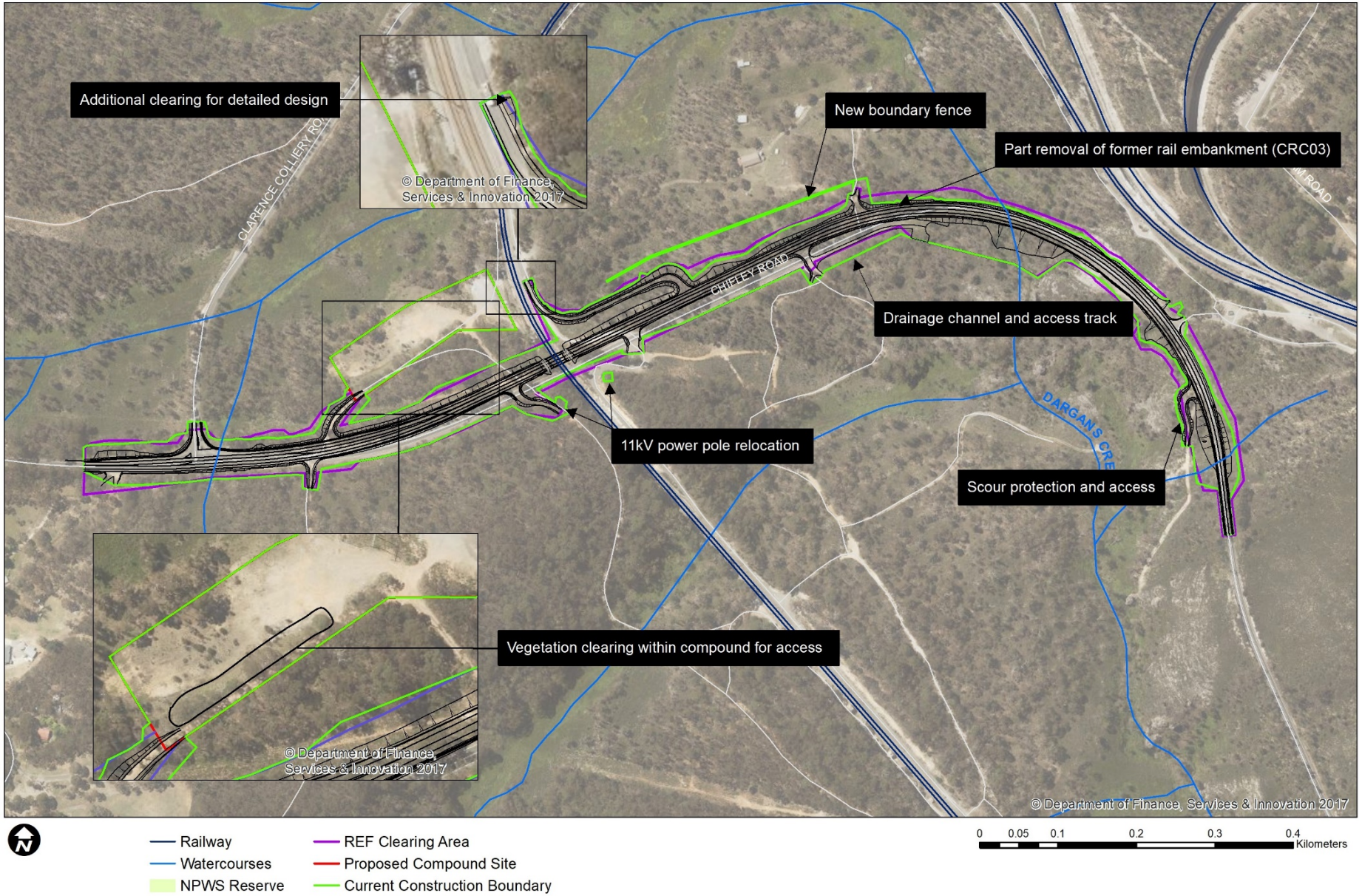

Figure 1-2: The proposed modification

1.2 Purpose of the report

This addendum review of environmental factors (REF) has been prepared by Hills Environmental on behalf of Roads and Maritime, Greater Sydney Program Office. For the purposes of these works, Roads and Maritime is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This addendum REF is to be read in conjunction with the project REF and submissions report. The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in context of clause 228 of the Environmental Planning and Assessment Regulation 2000, *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (*Is an EIS Required?* guidelines) (DUAP, 1995/1996), *Roads and Road Related Facilities EIS Guideline* (DUAP, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the addendum REF helps to fulfil the requirements of:

- Section 5.5 of the EP&A Act including that Roads and Maritime examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity
- The strategic assessment approval granted by the Federal Government under the EPBC Act in September 2015, with respect to the impacts of Roads and Maritime's road activities on nationally listed threatened species, ecological communities and migratory species.

The findings of the addendum REF would be considered when assessing:

- Whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- The potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Government Department of the Environment and Energy for a decision by the Australian Government Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

2.1 Strategic need for the proposed modification

Chapter 2 of the project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project.

The proposed modification is needed to allow the staged delivery of the project to align with available funding. It also addresses requirements arising from the detailed design and construction planning process, specifically:

- Removal of trees within the proposed site compound to allow safe access for large vehicles and plant
- Extension of the construction boundary at some locations to accommodate power pole relocations (with required clearance to vegetation), scour protection, access and new boundary fencing
- Reduction in the construction boundary at some locations to reflect the requirements of the final design
- Removal rather than covering of the eastern end of former railway embankment (heritage item CRC03) as this area is now in cut (not fill) and requires excavation to lay pavement.

2.2 Proposal objectives and development criteria

Section 2.3 of the project REF identifies the proposal objectives and development criteria that apply to the proposed modification. No additional criteria or objectives have been identified for the proposed modification.

2.3 Alternatives and options considered

2.3.1 Methodology for selection of preferred option

The proposed modification involves project staging and several changes that have arisen during detailed design. The two stages identified reflect elements of the project that are spatially separate (Clarence Bridge and Scenic Hill) and can therefore be readily constructed and operated separately. It was not necessary to consider other staging options.

Similarly, the other elements of the proposed modification directly respond to the detailed design and did not require consideration of other options.

In this context, the process of option evaluation had two broad stages:

1. A consideration of whether the proposal in any configuration could be justified. This is an evaluation of the ‘do nothing’ option.
2. An evaluation of other options by reference to the respective impacts and benefits.

2.3.2 Identified options

As noted above, Roads and Maritime investigated the ‘do nothing’ option and one other option:

1. ‘Do nothing’ option – This option involves carrying out the project as described in the project REF, without any staging

2. Option 1 – This option involves implementing the project in two stages (Stage 1 Clarence Bridge and Stage 2 Scenic Hill), making adjustments to the project boundary, revising the extent of native vegetation clearing required and clarifying the type and extent of impact on railway embankment (heritage item CRC03).

2.3.3 Analysis of options

The do nothing option does not address the identified need and would therefore only be preferred in circumstances where the costs and environmental impacts of proceeding were assessed as outweighing identified benefits. That was not the case and therefore the 'do nothing' option was not pursued further.

Option 1 was selected as the preferred option because it allows staging of the project to align with funding allocations and best reflects the detailed design in terms of construction extent and quantum of native vegetation clearing. The impacts of the proposed modification have been assessed and found not to be significant. Refer to Chapter 6 (Environmental assessment).

2.4 Preferred option

The preferred option is to construct and operate the project in two stages (Stage 1 Clarence Bridge and Stage 2 Scenic Hill), with adjustments to the project boundary, a revised extent of native vegetation clearing required and part removal of a former railway embankment (heritage item CRC03).

3. Description of the proposed modification

3.1 The proposed modification

Roads and Maritime proposes to modify the Bells Line of Road Chifley Road Upgrade project by staging delivery, changing the project boundary and vegetation clearing extents and modifying the work methodology as it relates to an identified heritage item. The proposed modification is shown in Figure 1-2.

Key features of the proposed modification would include:

- Delivery of the project in two stages being:
  - Stage 1: Replacement of the existing Clarence road over rail bridge, widening and realigning of approaches and improvements to the Clarence Colliery Road intersection with Chifley Road
  - Stage 2: Widening and realigning Chifley Road at Scenic Hill, provision of an additional descending lane and median barrier, improvements at the Lithgow Ex-Prisoner of War Memorial Tower intersection, and improved concrete drains along road cuttings
- Changes to the project boundary for Stage 1 arising from the detailed design process, including changes native vegetation clearing
- Additional vegetation clearing within the nominated site compound for Stage 1
- Removal rather than covering of the eastern end of former railway embankment (heritage item CRC03) to accommodate the raising and widening of the road.

3.2 Design

3.2.1 Main features of the modification

Staging

Section 3.1 of the Project REF described the project as including upgrades to the Scenic Hill and Clarence road over rail bridge sections of Chifley Road. Section 3.3.2 of the project REF discussed the potential construction staging for each of these project components but did not contemplate each as a separate stage that could be constructed and operated independently of the other. Section 3.3.3 of the project REF specifically notes that the Scenic Hill and Clarence road over rail bridge upgrades are proposed to be undertaken at the same time.

As part of the proposed modification it is now proposed that the project be delivered in two sequential stages being:

- Stage 1: Replacement of the existing Clarence road over rail bridge, widening and realigning of approaches and improvements to the Clarence Colliery Road intersection with Chifley Road
- Stage 2: Widening and realigning Chifley Road at Scenic Hill, provision of an additional descending lane and median barrier, improvements at the Lithgow Ex-Prisoner of War Memorial Tower intersection, and improved concrete drains along road cuttings.

Clearing within site compound

Section 3.4 and Figure 1.2b of the project REF identified Ancillary Site 3 and noted that it would be used as a main construction compound for the Clarence road over rail bridge component of the project as well as stockpiling, materials lay down and storage.

The study area for the for the Biodiversity Assessment Report included in Appendix F of the project REF did not extend to Ancillary Site 3. It was therefore assumed that native vegetation clearing would not occur within the boundaries of Ancillary Site 3.

As part of the detailed design process, it has been identified that some clearing of native vegetation within Ancillary Site 3 would be required to allow safe access for large vehicles and plant. The amount of clearing required Ancillary Site 3 is estimated to be about 0.15 hectares for this component of the proposed modification.

Boundary adjustments

As part of the detailed design process, the construction footprint for the Clarence Bridge component of the project (the proposed Stage 1) has been modified in response to the refinements made to the alignment and to ensure there is enough space for drainage features, fencing, utility relocations, construction access, crane pads and general constructability requirements. This has resulted in a reduction of the footprint in some areas and an extension of the footprint in others as shown by Figure 1-2.

As a result of the proposed changes to the construction boundary, there are consequential changes to the vegetation clearing calculations that were presented in Table 6.7 of the project REF. Overall, there would be an approximate 0.166 hectare reduction in vegetation clearing, from 4.63 hectares under the project REF to 4.464 hectares under the detailed design. Further discussion of changes to vegetation clearing is provided in Section 6.1 of this addendum REF.

Part removal of former railway embankment

The project REF considered potential impacts on heritage item CRC03 (linear embankment or formation). Section 6.9.4 of the project REF identified the impact as burial of the eastern end of the item, while the non-Aboriginal heritage assessment included in Appendix D of the project REF noted the following:

- Works would bury/conceal the eastern end of the formation and expose the remainder through the removal of trees
- Work would conceal the eastern end of the formation resulting in a minimal impact on the heritage significance of the item
- Recommendation to establish curtilages around the item to prohibit vehicle movement as well as care to be taken to minimise impacts when clearing vegetation
- Recommendation that surviving portions of CRC03 not be deliberately removed and/or buried as part of the construction.

While the project REF indicated burial of this item, the item would need to be destroyed as this area is now in cut (not fill) and it would need to be excavated to lay pavement.

3.3 Construction activities

3.3.1 Work methodology

The work methodology for the project, inclusive of the proposed modification, would be consistent with the description in section 3.3.1 of the project REF.

3.3.2 Construction hours and duration

No changes to working hours are proposed as part of the proposed modification. Construction hours and duration remain as described in Section 3.3.3 of the project REF, with work on Stage 1 now expected to commence in late 2018.

Detailed design for Stage 2 (Scenic Hill) is expected to commence in late 2018 with construction in mid-2020.

3.3.3 Plant and equipment

The plant and equipment required for the project, inclusive of the proposed modification, would be consistent with the description in section 3.3.4 of the project REF.

3.3.4 Earthworks

Section 3.3.5 of the project REF noted that, considered together, both Scenic Hill and Clarence road over rail bridge upgrades minimise the generation of excess spoil and/or the need to import large quantities of fill. With the proposed staging of the project there would be a need to import more material from suppliers (given that material from Stage 2 would not be available for Stage 1). Key earthwork volumes for Stage 1 of the project are as follows:

- Removal and stockpiling of non-contaminated topsoil – 3,636 cubic metres
- General earthworks (cut and fill) – 9,636 cubic metres
- Imported or borrowed material (other than selected material, verge material and foundation treatment material) – 21,313 cubic metres
- Unsuitable material – 2,765 cubic metres
- Selected Material Zone, imported material – 5,990 cubic metres
- Verge, imported material – 1,277 cubic metres.

3.3.5 Source and quantity of materials

Section 3.3.6 of the project REF noted that a large amount of the required fill material would be sourced from materials cut out of embankments and other areas, particularly for the Scenic Hill upgrade.

With the proposed staging of the project there would be a need to import more material from suppliers (given that material from Stage 2 would not be available for Stage 1). This would include licensed quarries and commercial suppliers in the local Lithgow region, wherever possible.

3.3.6 Traffic management and access

Traffic management and access for the project, inclusive of the proposed modification, would be consistent with the description in section 3.3.7 of the project REF.

The project REF notes that for Clarence road over rail bridge upgrade, truck movements during the work are expected to increase by 10-20 movements per day, increasing to 40 movements per day at certain stages of the work.

While the proposed modification is not expected to change the construction traffic generation associated with the Clarence Bridge component of the project, a proportion of trucks importing fill would have their origins at quarries in the Lithgow region, rather than at the Scenic Hill site.

3.4 Ancillary facilities

No additional ancillary facilities are required for the proposed modification. As described in section 3.2.1, some vegetation clearing within Ancillary Site 3 is now proposed.

3.5 Public utility adjustment

No public utility adjustments are required for the proposed modification.

3.6 Property acquisition

No property acquisition is required for the proposed modification.

4. Statutory and planning framework

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for a road and is to be carried out by Roads and Maritime, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

The proposed modification is not located on land reserved under the *National Parks and Wildlife Act 1974* (NPW Act) and does not affect land or development regulated by State Environmental Planning Policy No. 14 – Coastal Wetlands, State Environmental Planning Policy No. 26 – Littoral Rainforests, State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (State Significant Precincts) 2005.

Part 2 of the ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by ISEPP (where applicable), is discussed in chapter 5 of this addendum REF.

State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011

State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 relates to the use of land within the Sydney drinking water catchment. The Clarence road over rail bridge component (Stage 1) of the project is in the Mid Coxs River sub-catchment.

Clause 12 of the SEPP requires consideration of whether or not an activity to which Division 5.1 of the EP&A Act applies will have a neutral or beneficial effect on water quality before carrying out the activity. A neutral or beneficial effect assessment is included in Appendix C. The assessment concludes that the proposed modification would have a beneficial effect on water quality.

4.1.2 Local Environmental Plans

The discussion of the Lithgow Local Environmental Plan 2014 in Section 4.4.1 of the project REF remains relevant to the project inclusive of the proposed modification.

4.2 Other relevant NSW legislation

The review of other relevant state legislation presented in Section 4.2 of the project REF remains applicable to the project, subject to recent changes to legislation considered below.

4.2.1 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) and its supporting regulations commenced on 25 August 2017. The BC Act repeals the *Threatened Species Conservation Act 1995* along with other natural resource management legislation. The BC Act sets out the assessment framework for threatened species and ecological communities for activities subject to assessment under Division 5.1 of the EP&A Act (amongst other types of development).

Under Part 7 of the BC Act, a species impact statement (or biodiversity assessment report) is required in relation to an activity that is likely to significantly affect threatened species (which is defined to include ecological communities, or their habitats) and the concurrence of the Environment Agency Head may be required.

4.2.2 Biosecurity Act 2015

Under the Biosecurity Act 2015, which came into effect on 1 July 2017 and repealed the Noxious Weeds Act 1993, 'all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable'.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act a referral is required to the Australian Government for proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in Appendix A and Chapter 6 of the addendum REF.

A referral is not required for proposed road actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Potential impacts to these biodiversity matters are also considered as part of chapter 6 of the addendum REF and Appendix D.

Findings – matters of national environmental significance (other than biodiversity matters)

The assessment of the proposed modification's impact on matters of national environmental significance and the environment of Commonwealth land found that there would be no change to the findings of the determined activity and would be unlikely to cause a significant impact on matters of national environmental significance or the environment of Commonwealth land. A referral to the Australian Government Department of the Environment and Energy is not required.

4.4 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of road and is being carried out by or on behalf of a public authority. Under clause 94 of the ISEPP the proposed modification is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Division 5.1 of the EP&A Act. Consent from Council is not required.

5. Consultation

5.1 Consultation strategy

The consultation strategy for the project remains as outlined in Section 5.12 of the project REF. No changes to the consultation strategy were required for the project REF.

5.2 Consultation outcomes

Community and stakeholder consultation for the project is discussed in Chapter 5 of the project REF and in the submissions report.

Given the minor nature of the proposed modification, further community consultation was not considered necessary. The updated timing for the Clarence Bridge and Scenic Hill components of the project has been communicated via the Roads and Maritime website.

5.3 Ongoing or future consultation

Ongoing and future consultation for the project remains consistent with Section 5.6 of the project REF.

6. Environmental assessment

This section of the addendum REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposed modification of the Bells Line of Road Chifley Road Upgrade project. All aspects of the environment potentially impacted upon by the proposed modification are considered. This includes consideration of the factors specified in the guidelines *Roads and Related Facilities EIS Guideline* (Department of Urban Affairs and Planning, 1996) and *Is an EIS required?* (Department of Planning, 1995) as required under clause 228(1) of the Environmental Planning and Assessment Regulation 2000. The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix A.

Site-specific safeguards and management measures are provided to ameliorate the identified potential impacts.

6.1 Biodiversity

6.1.1 Methodology

Lesryk Environmental was engaged to prepare a supplementary ecology investigation for this addendum REF. The main findings are summarised in the following sections, while the full report is included in Appendix D.

The approach to the supplementary ecology investigation involved:

- Databases searches and literature review, which included:
  - Biodiversity Assessment Report – Chifley Road Upgrade, Clarence (RPS, 2016)
  - The Vegetation of the Western Blue Mountains including the Capertee, Coxs, Jenolan & Gurnang Areas Volume 1: Technical Report/Volume 2: Vegetation Community Profiles (Department of Environment and Conservation, 2006)
  - Office of Environment and Heritage's (OEH) Bionet database
- An ecological investigation (consistent with the Framework for Biodiversity Assessment methods adopted for the project REF) within Ancillary Site 3 and the additional project area at Rail Access 1 on 30 July 2018 which targeted threatened flora and fauna species and their habitats previously recorded near the project site
- A survey for hollow-bearing trees in those accessible areas where the construction boundary is proposed to be extended on Wednesday 8 August 2018.

The Biodiversity Assessment Report previously prepared for the project (RPS, 2016) was relied on for those construction boundary extensions within its study area. Additional surveying only occurred in relation to proposed clearing outside the previous study area (ie within Ancillary Site 3 and near Rail Access 1).

6.1.2 Existing environment

The existing environment in relation to biodiversity is described in Section 6.4.1 of the project REF. The results of the additional ecological survey are provided below.

Rail Access 1 area

This area occurs adjacent to the rail access road and at the edge of a woodland. The area to be disturbed consists of cleared land with bare sand/gravel/dirt and a groundcover layer of vegetation comprised of

native and exotic grasses, herbs and forbs. The occasional shrub and semi-mature tree may potentially be disturbed.

Common native species present include Mat Rush (*Lomandra longifolia*), Snowgrass (*Poa sieberiana* var. *sieberiana*), *Rytidosperma* sp., Flax Lily (*Dianella* sp.), Sunshine Wattle (*Acacia terminalis*), *Persoonia* sp., *Cassinia* sp. and Broad-leaved Peppermint (*Eucalyptus dives*).

Common introduced species include Pigeon Grass (Setaria sp.), Lamb's Tongue (Plantago lanceolata), Fleabane (*Conyza bonariensis*), Catsear (*Hypochaeris radicata*), Purple Top (*Verbena bonariensis*) and Blackberry (*Rubus fruticosus* agg. spp.).

No hollow-bearing trees or any other habitat features that would be important for native animals (e.g. drainage lines, caves, rock outcrops) were recorded in this area.

Ancillary Site 3

The Ancillary Site 3 area is dominated by the regrowth of native saplings, shrubs and grasses with a large amount of bare ground. Common species include *Eucalypt* spp., *Leptospermum* spp., Sydney Golden Wattle (*Acacia longiflora* var. *longifolia*), Cassinia sp., Laurel-leaf Grevillea (*Grevillea laurifolia*), Mat Rush, Purple Wiregrass (*Aristida ramosa*), *Austrostipa* sp. and Snowgrass.

Introduced species such as African Love Grass (Eragrostis curvula), Buffalo Grass (*Stenotaphrum secundatum*), Lamb's Tongue, Purple Top, Catsear and Blackberry are also present within the regrowth area and along the edges.

Along the edges of the proposed compound site is a stand of Narrow-leaved Peppermint (*Eucalyptus radiata*), Broad-leaved Peppermint and Brittle Gum (*Eucalyptus mannifera*), these reaching heights of 12-15 metres. Along the southern edge adjacent to the compound site access track, an understorey of native shrubs reaches around one metre in height. Common species include Broom Spurge (*Amperea xiphoclada*), Hop Bitter-pea (*Daviesia latifolia*), Common Conesticks (*Petrophile pulchella*), Sydney Golden Wattle, Persoonia sp., Paperbark Tea-tree (*Leptospermum trinervium*) and Wallum Heath (*Epacris pulchella*). The groundcover at this location is dominated by Laurel-leaf Grevillea, Blue Dampiera (*Dampiera stricta*), Lomandra spp., Rytidosperma sp. and Flax Lily.

A small ephemeral drainage channel directs water in a northerly direction, however, no water was identified in this drainage channel at the time of the field investigation. The vegetation present in association with this area is a high density of Mat Rush, Snowgrass, Laurel-leaf Grevillea and *Leptospermum* spp.

A small area of Silvertop Ash and Peppermints (Eucalypt spp.) is present within the south-eastern section of Ancillary Site 3. The understorey and groundcover are similar to that described for the linear strip of trees present along the southern boundary. Additional species recorded in this area include Sunshine Wattle, Small-leaved Boronia (*Boronia microphylla*), Crinkle Bush (*Lomatia silaifolia*), Broad-leaf Geebung (*Persoonia levis*) and Bracken Fern (*Pteridium esculentum*).

No hollow-bearing trees or any other habitat features that would be important for native animals (e.g. drainage lines, caves, rock outcrops) were recorded in this area.

Conservation significance of vegetation

Vegetation at the Rail Access 1 area conforms to Newnes Plateau Narrow-leaved Peppermint - Silver-top Ash Layered Open Forest, while vegetation at the proposed compound site conforms to Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest. The same communities are affected by the other proposed boundary extensions in addition to an area of Newnes Plateau Tea Tree - Banksia - Mallee Heath at the eastern end of the project (see Figure 6-1).

Neither of these communities are listed as, or considered to be a part of, a threatened ecological community identified under the EPBC Act or BC Act.

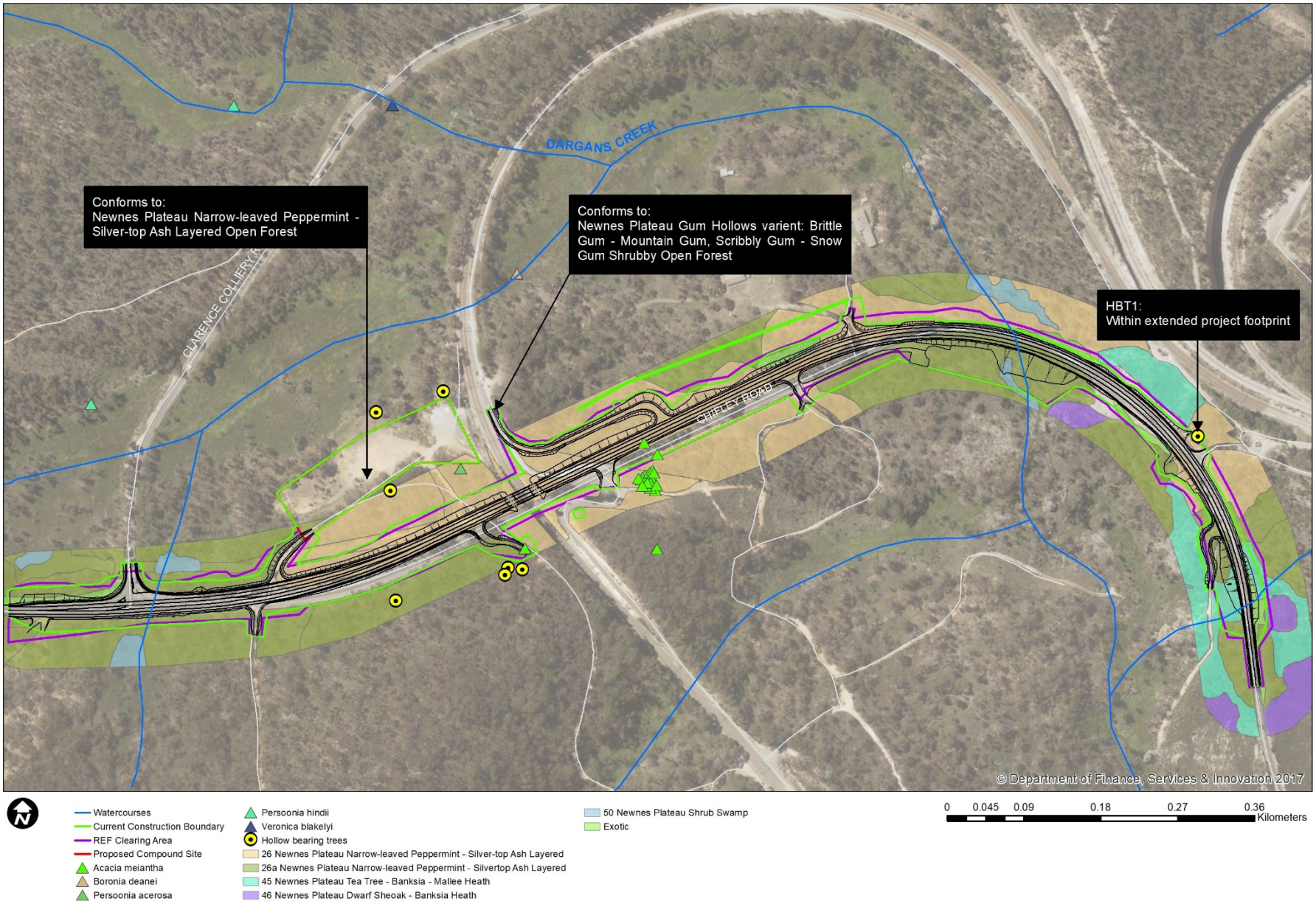

Figure 6-1: Vegetation communities, hollow-bearing trees and threatened flora

An area of Newnes Plateau Shrub Swamp, listed as endangered under the BC Act and EPBC Act (as Temperate Highland Peat Swamps on Sandstone), occurs immediately north of Ancillary Site 3 but outside the construction footprint.

Of those plants identified in areas affected by the proposed modification, none are listed, or currently being considered for listing, by either the EPBC Act or BC Act. Similarly, none are of regional conservation significance or listed as a Rare or Threatened Australian Plant (RoTAP).

The area affected by the proposed modification contains potential habitat for *Acacia meiantha*, although targeted investigations did not identify any individuals of this species in the Ancillary Site 3 or Rail Access 1 areas. Previous records for this species are shown in Figure 6-1.

Weeds

Under the *Biosecurity Act 2015*, 'all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.'

Blackberry (*Rubus fruticosus*) was recorded along the northern boundary of Ancillary Site 3. Blackberry is listed:

- under Schedule 3 of the NSW Biosecurity Regulation 2017
- as a 'priority weed' in the Central Tablelands region (which includes the Lithgow local government area) (NSW Department of Primary Industries)
- as a Weed of National Significance

Under the NSW Department of Primary Industries listing, Blackberry has been assigned the following:

- Prohibition on dealings - Must not be imported into the State or sold
- Regional - Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.

Fauna

Three native mammal and nine native birds were recorded within, or in the vicinity of, the areas investigated (Ancillary Site 3 and Rail Access 1). None of the species recorded are listed, or currently being considered for listing, by the EPBC Act or BC Act. One hollow bearing tree was recorded within the extended project footprint, near its eastern extent (refer to Figure 6-1).

6.1.3 Potential impacts

Impacts on vegetation and threatened flora

The proposed modification would result in an overall reduction in native vegetation clearing of 0.166 hectares. Table 6-1 compares the required clearing identified in the project REF with that required for the proposed modification.

Table 6-1 Comparison of vegetation clearing under the Project REF and proposed modification

Vegetation community	REF clearing (ha)	Detailed design clearing (ha)	Difference (ha)

Vegetation community	REF clearing (ha)	Detailed design clearing (ha)	Difference (ha)
26 Newnes Plateau Narrow-leaved Peppermint – Silver-top Ash Layered	2.57	2.374	- 0.196
26a Newnes Plateau Gum Hollows variant: Brittle Gum – Mountain Gum, Scribbly Gum – Snow Gum Shrubby Open Forest	1.83	1.88	+ 0.05
45 Newnes Plateau Tea Tree - Banksia - Mallee Heath	0.19	0.18	- 0.01
46 Newnes Plateau Dwarf Sheoak - Banksia Heath	0.01	0.00	- 0.01
50 Newnes Plateau Shrub Swamp	0.03	0.03	0.00
Total	4.63	4.464	- 0.166

Note: The clearing figures include clearing required within Ancillary Site 3 and at Rail Access 1.

The proposed modification would not directly affect endangered ecological communities listed by either the EPBC Act or BC Act. While an area of Newnes Plateau Shrub Swamp, listed as endangered under the BC Act and EPBC Act (as Temperate Highland Peat Swamps on Sandstone), occurs immediately north of Ancillary Site 3, with the adoption of the safeguards and management measures identified in Section 6.1.4, no direct or indirect impacts on this endangered ecological community are considered likely. Accordingly, no assessments of significance using the criteria provided under the EPBC Act's Significant Impact Guidelines or Section 7.3 of the BC Act have been conducted.

While the area affected by the proposed modification contains potential habitat for *Acacia meiantha*, targeted investigations did not identify any individuals of this species in the Ancillary Site 3 or Rail Access 1 areas. Further, consistent with the findings of the project REF, the project (inclusive of the proposed modification) would not result in the removal of this species from the study area and would not affect the lifecycle of *A. meiantha* such that a local population of the species is likely to be placed at risk of extinction.

Fauna

The project REF and the Revised Assessment of Significance included at Appendix 2 of the Submissions Report found that the project would not directly affect threatened fauna individuals and impacts would be limited to the loss of low-value potential habitat. This supported a conclusion that the project would not be likely to cause a significant impact on the threatened fauna. As the proposed modification would reduce the overall amount of fauna habitat affected by the project, there is not expected to be any increase in impacts on threatened fauna.

One hollow bearing tree was recorded within the extended project footprint, near its eastern extent. It is expected that this hollow bearing tree can be retained with an adjustment to the design of a nearby drain. However, for the purposes of assessment it has been assumed that this tree could be affected by the works and an assessment of potential impacts on those threatened hollow-dependent microchiropteran bats that have previously been recorded within wider area was conducted (Yellow-bellied Sheathtail-bat, Eastern False Pipistrelle). With reference to the criteria provided by Section 7.3 of the BC Act, the assessment concluded that the proposed modification would not have a significant impact on either of these species.

The native species recorded within the Ancillary Site 3 and Rail Access 1 areas are all protected, as defined by the BC Act, but are common to abundant throughout the surrounding region and have been recorded in association with a range of woodland and forest habitats, as well as disturbed environments. These species would not be solely reliant upon those habitats present such that the removal or further

disturbance of these would threaten the occurrence of these animals. The species recorded are all expected to be present at both the site and within the surrounding locality post-development.

Other impacts

The type and scale of the proposed modification mean that it would not alter the assessment of other biodiversity impacts as discussed in the project REF, specifically:

- Vehicle strike
- Impacts on the aquatic ecology of Dargans Creek
- Edge effects
- Introduction of weeds and pests
- Increased levels of noise and dust
- Runoff
- Operational impacts.

Conclusion on significance of impacts

The proposed modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the BC Act *or* FM Act and therefore a Species Impact Statement is not required.

The proposed modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the EPBC Act.

6.1.4 Safeguards and management measures

The following additional measures are proposed to address the potential biodiversity impacts of the proposed modification.

Impact	Environmental safeguards	Responsibility	Timing
Removal of vegetation / fauna habitat	Clearing of native vegetation (particularly mature trees) within Ancillary Site 3 will be limited to the minimum required to achieve safe access for vehicles and construction plant	Contractor	Construction
Removal of vegetation / fauna habitat	Design options to allow retention of the hollow bearing tree HBT1 in the eastern part of the project area will bereviewed. If the subject tree can be retained, temporary fencing/bunting will be established at the outer limits of this plant's drip line and no vehicles or machinery will be stored or parked within this area. A no-go sign will also be established on the temporary fencing/bunting.	Contractor	Pre-construction
Impacts on endangered ecological communities	Sedimentation fencing/bunding and exclusion fencing will be established along the northern perimeter of the Ancillary Site 3 to safeguard against potential impacts to the adjacent Newnes	Contractor	Pre-construction

Impact	Environmental safeguards	Responsibility	Timing
	Plateau Shrub Swamp endangered ecological community.		
Cumulative impacts on threatened ecological communities	The construction footprint for Stage 2 will be reviewed and minimised where possible. The need for biodiversity offsets for the project, Stage 1 and Stage 2 cumulatively, would be identified in accordance with the Guideline for Biodiversity Offsets (Roads and Maritime Services, 2011) during Stage 2 detailed design.	Roads and Maritime	Detailed design

6.1.5 Biodiversity offsets

The project REF notes that biodiversity offsets may be required in accordance with the Guideline for Biodiversity Offsets (Roads and Maritime Services, 2011) and also notes that in accordance with Table 1 of the Guideline, clearing for the project triggers offsets under the criteria in Category 4.

The potential biodiversity impacts, including native vegetation clearing, associated with Stage 1 of the project have been reviewed against Table 1 of the Guidelines. The review, which is included as part of the supplementary ecological investigation in Appendix D, concludes that a requirement for biodiversity offsets is not triggered by Stage 1.

The construction footprint for Stage 2 will be reviewed during detailed design of that stage and prior to construction. The need for biodiversity offsets for the project, in accordance with the Guideline, would be determined at that time.

6.2 Non-Aboriginal heritage

6.2.1 Methodology

Cosmos Archaeology was engaged to prepare an addendum Statement of Heritage Impact (addendum SoHI) for this addendum REF. The main findings are summarised in the following sections, while the full report is included in Appendix D.

The addendum SoHI considers the change in impacts to item CRC03 as a result of the proposed modification in accordance with Statements of Heritage Impact (Heritage Office (NSW), 2002).

6.2.2 Existing environment

The existing environment for the project in relation to non-Aboriginal heritage is described in Section 6.8.2 of the project REF. Non-Aboriginal heritage items associated with the proposed modification would be confined to heritage item CRC03.

The formation of heritage item CRC 03 is located on the northern side of the existing road and is partly within the project construction footprint (refer to Figure 1-2). This feature is a linear embankment or formation, the upper part seemingly composed of sandstone chips/gravel and possibly some course grained basalt up to 15 millimetres across. It is up to three metres wide and flat at the top and is up to two metres high. Numerous trees are growing on the top of the feature.

The remnant formation which is approximately 70 metres in length runs on an approximate east-west axis. It intersects, and has been cut by, Chifley Road where the causeway over Dargan Creek valley starts at its western end. The western end of the formation has been cut by the access track connecting private property (Lot 2 DP 606571) to Chifley Road.

The formation is part of the original alignment of the Western railway line to Bowenfels/Lithgow, which was constructed in 1869. This section of the line was abandoned in 1897 with the opening of the Dargan Creek Deviation.

While not specifically listed by the Lithgow LEP, the formation is of local heritage significance through its association with the 1869 alignment of the Western railway line and to a limited extent to its ability to provide information on how this type of railway infrastructure was formed at this point along the railway line.

Figure 6-2: View west along the alignment of CRC03

6.2.3 Potential impacts

The project REF assumed burial of CRC03, however the item would now need to be partly destroyed as the affected area is now in cut (not fill) and it would need to be excavated to lay pavement.

The addendum SoHI concludes the following in relation to this change:

- Works would still leave the majority of the formation more visible, and more amenable to interpretation, with the removal of trees and other vegetation
- Works would remove about 15 metres from the eastern end of the formation and this would have minor impact on the significance of the item
- During the construction phase there is potential for the remaining part of the formation to be damaged by machinery.

6.2.4 Safeguards and management measures

The following modified and additional measures are proposed to address the potential non-Aboriginal heritage impacts of the proposed modification.

Impact	Environmental safeguards	Responsibility	Timing
Impact on non-Aboriginal heritage items from the work	~~Damage to the unburied portion of site CRC 03 will be avoided where practical.~~ An exclusion zone in relation to the portion of heritage item CRC03 to be retained is to be delineated by survey, marked on site and shown on construction drawings. Vehicles and plant are not to access the portion of CRC03 to be retained. Visual access to the CRC03 is to be maintained during construction to prevent inadvertent access/damage.	Contractor	Pre-construction and Construction
Impact on non-Aboriginal heritage items from the work	An archaeologist is to record the exposed face or section of the formation after the formation has been cleared of vegetation and excavation of the affected section has occurred. The recording will include measured drawings and photography. The objective of the recording is to document how the formation was constructed and what materials were used.	Contractor	Construction
Impact on non-Aboriginal heritage items from the work	The ballast that comprises the section of the formation to be retained is to be protected by an exclusion zone and will not be used for any aspect of the project.	Contractor	Construction

6.3 Other impacts

6.3.1 Existing environment and potential impacts

Environmental factor	Existing environment	Potential impacts
Hydrology and drainage	Refer to Section 6.1.1 of the project REF.	The potential hydrology and flooding impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.1.3 of the project REF. Safeguards HY-1 to HY-5 are adequate to address potential impacts.
Water quality	Refer to Section 6.2.1 of the project REF.	The potential water quality impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.2.3 of the project REF. Neutral or beneficial effect assessment included in Appendix C identifies that as part of the detailed design predicted total suspended solids, total phosphorus, total nitrogen and gross pollutant loads have been further reduced when compared to the existing situation. Safeguards WQ-1 to WQ-8 are adequate to address potential impacts.
Topography, geology, soils and contamination	Refer to Section 6.3.1 of the project REF.	The potential soils and contamination impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.3.3 of the project REF. Safeguards TGS-1 to TGS-12 are adequate to address potential impacts.
Traffic and access	Refer to Section 6.5.1 of the project REF.	The potential traffic and access impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.5.2 of the project REF.

Environmental factor	Existing environment	Potential impacts
		The proposed staging of the project would reduce the number of truck movements between the Scenic Hill (Stage 2) and Clarence Bridge (Stage 1) sites but would increase the number of trucks accessing the Stage 1 site from suppliers in the broader region. Access would still be via Chifley Road and as noted in the project REF, Chifley Road has relatively low existing traffic volumes and would be able to accommodate the increases in traffic as a result of the project. Safeguards TR-1 to TR-7 are adequate to address potential impacts.
Noise and vibration	Refer to Section 6.6.1 of the project REF. The Project REF, the closest sensitive receivers are approximately 85m to the north of the project. Sensitive receivers are also located near the south west of the project.	The potential noise and vibration impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.6.4 of the project REF. No changes are proposed to the work methodology, construction staging and program, construction hours and duration, plant and equipment and other works methodology details identified in Section 3.3 of the Project REF. No changes have been made to the design which are likely to impact the operational noise impacts identified in the Project REF. Safeguards NV-1 to NV-5 are adequate to address potential impacts.
Aboriginal heritage	Refer to Section 6.7.2 of the project REF.	The potential Aboriginal heritage impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.7.4 of the project REF. A Stage 1 clearance in accordance with the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (Roads and Maritime Services, 2011) has been issued for the proposed modification.

Environmental factor	Existing environment	Potential impacts
		Safeguards AH-1 to AH-5 are adequate to address potential impacts.
Landscape character and visual impacts	Refer to Section 6.9.1 of the project REF.	The potential landscape character and visual impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.9.3 of the project REF. There would be no incremental impacts on landscape character zones 3 or 4. Safeguards LCV-1 to LCV-9 are adequate to address potential impacts.
Socio-economic and land use	Refer to Section 6.10.1 of the project REF.	The potential socio-economic and land use impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.10.2 of the project REF. Safeguards SE-1 to SE-6 are adequate to address potential impacts.
Air quality	Refer to Section 6.11.1 of the project REF.	The potential air quality impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.11.3 of the project REF. Safeguard AQ-1 is adequate to address potential impacts.
Waste	Refer to Section 6.12.1 of the project REF.	The potential waste impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.12.3 of the project REF. The proposed staging of the project would however reduce the opportunity to re-use excavated material from Stage 2 as fill for the construction of Stage 1. Suitable locations for the re-use / disposal of excess material from Stage 2 would therefore need to be identified during construction planning for that stage. Safeguards WA-1 to WA-8 are adequate to address potential

Environmental factor	Existing environment	Potential impacts
		impacts.
Climate change	Refer to Section 6.13.1 of the project REF.	The potential climate change impacts of the project, inclusive of the proposed modification, would be consistent with those discussed in Section 6.13.3 of the project REF. No safeguards are required to address potential climate change impacts.

6.3.2 Safeguards and management measures

No additional or modified safeguards or management measures are required to address other impacts associated with the proposed modification.

6.4 Cumulative impacts

6.4.1 Potential impacts

Given the location and scale of the proposed modification, cumulative impacts are not expected. In this context, it is noted that the proposed modification:

- Would have a beneficial effect on water quality by further reducing nutrient and pollutant loads when compared to the existing situation
- Would slightly alter the distribution of construction traffic on the network but would not increase overall heavy vehicle volumes
- Would reduce the clearing of native vegetation
- Would have only a minor impact on the heritage values of one locally significant heritage item
- Would not affect Aboriginal cultural heritage.

Minimising impacts attributable to the proposed modification is the best way to address any potential cumulative effects and various measures have been proposed to address impacts both in Table 4-1 of the submissions report and in this addendum REF.

6.4.2 Safeguards and management measures

Safeguard C-1 is adequate to address potential cumulative impacts. No additional measures are required.

7. Environmental management

7.1 Environmental management plans

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Project Environmental Management Plan (PEMP) and Contractors Environmental Management Plan (CEMP) and applied during the construction and operation of the proposed modification.

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures for the Bells Line of Road Chifley Road Upgrade project are summarised in Table 7-1. Additional safeguards and management measures identified in this addendum REF are included in bold and italicised font. The safeguards and management measures will be incorporated into the CEMP and the PEMP and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

Table 7-1: Summary of safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
G-1	General	• All environmental safeguards must be incorporated within the following: – Detailed design stage – Contract specifications for the proposal – Contractor's Environmental Management Plan	Roads and Maritime/ Contractor	Detailed design	1 and 2
G-2	General	• A risk assessment must be carried out on the proposal in accordance with the Roads and Maritime Services Project Pack and PMS risk assessment procedures to determine an audit and inspection program for the work. The recommendations of the risk assessment are to be implemented • A review of the risk assessment must be undertaken after the initial audit or inspection to evaluate is the level of risk chosen for the project is appropriate • Any work resulting from the proposal and as covered by the REF may be subject to environmental audit(s) and/or inspection(s) at any time during their duration.	Roads and Maritime	Pre-construction	1 and 2
G-3	General	• The environmental contract specification must be forwarded to the Roads and Maritime Services ***project environment representative*** ~~Manager in the Greater Sydney Program~~ office for review at least ten working days prior to the tender stage	Roads and Maritime	Pre-construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
		• A contractual hold point must be maintained until the CEMP is reviewed by the Roads and Maritime Services ***project environment representative*** ~~Senior Environment Officer in the Greater Sydney region~~.			
G-4	General	• The Roads and Maritime Services ~~Environment Manager in the Greater Sydney Program office~~ ***project environment representative*** will be notified at least five working days prior to work commencing.	Roads and Maritime	Pre-construction	1 and 2
G-5	General	• All businesses and residences likely to be affected by the proposed work must be notified at least five working days prior to the commencement of the proposed activities.	Roads and Maritime/ Contractor	Pre-construction	1 and 2
G-6	General	• Environmental awareness training must be provided, by the contractor, to all field personnel and subcontractors	Contractor	Pre-construction	1 and 2
HY-1	Changes to hydrology	• Prior to construction commencing, final hydrology and drainage assessments will be undertaken to inform detail design measures to minimise risks to the environment, properties and the project. This will include selection of appropriate scour protection treatments, energy dissipation and retention structures. Consultation will be undertaken with Water NSW on the final design measures.	Roads and Maritime/ Contractor	Detailed design/ preconstruction	1 and 2
HY-2	Culvert extension within Dargans Creek	• The culvert extension and re-alignment of Dargans Creek will be designed to maintain downstream bed stability, minimise changes to existing waterway length, and maintain existing flow velocity.	Contractor	Detailed design	1 only
HY-3	Blocking or diverting drainage channels	• Duration and length of any temporary drainage channel diversions will be minimised where reasonable and feasible.	Contractor	Construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
HY-4	Blocking or diverting drainage channels	• Temporary drainage channel diversions will include appropriate scour protection and energy dissipation measures, such as check dams.	Contractor	Construction	1 and 2
HY-5	Hydrology and flow regime	• Any dewatering activities will be undertaken in accordance with the *RTA Technical Guideline: Environmental management of construction site dewatering* in a manner that prevents pollution of waters and scouring of drainage channels or waterways.	Contractor	Construction	1 and 2
WQ-1	Sedimentation/ decreased water quality	• Batters will be designed and constructed to minimise risk or exposure, instability and erosion, and to support long-term, on-going best practice management, in accordance with the Roads and Maritime *Guideline for Batter Stabilisation Using Vegetation* (RMS, 2015a).	Contractor	Detailed design	1 and 2
WQ-2	Sedimentation/ decreased water quality	• A site specific erosion and sediment control plan will be prepared and implemented and included in the construction environmental management plan (CEMP). The plan will identify detailed measures and controls to be applied to minimise erosion and sediment control risks including, but not necessarily limited to: runoff, diversion and drainage points; sediment basins and sumps; scour protection; stabilising disturbed areas as soon as possible, check dams, fencing and swales; and staged implementation arrangements. The plan will also include arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather. Prior to commencement of the activity, the Soil and Water Management Plan will be reviewed by a soil conservationist on the RMS list of Registered Contractors for Erosion, Sedimentation and Soil Conservation Consultancy Services. The review will assess the adequacy of measures in the Plan and recommend any revisions	Contractor	Pre-construction / construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
		or additional measures required. The Soil and Water Management Plan will then be revised to address the outcomes of the review.			
WQ-3	Sedimentation/ decreased water quality of Dargans Creek	• A detailed environmental work method statement (EWMS) will be prepared and implemented for work activities within 100m of Dargans Creek, including the culvert extension and earthworks associated with the curve realignment. The EWMS will detail: – measures to avoid or minimise risks from erosion and sedimentation to water quality and biodiversity – maintain fish passage during construction – monitoring requirements to assess the performance of implemented mitigation measures. • The EWMS will be prepared in accordance with relevant guidelines including, but not limited to: – RMS *Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects* – NSW DPI (Fisheries) guidelines *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings*.	Contractor	Pre-construction / construction	1 only
WQ-4	Contamination of surface waters and groundwater related to accidental spills	• Spill management measures and procedures will be prepared and implemented as part of the CEMP to minimise the risk of pollution arising from spillage or contamination on the site and adjoining areas. The measures and procedures will address, but not necessarily be limited to: management and storage of chemicals and potentially polluting materials; any bunding requirements; refuelling requirements; maintenance of plant and equipment; and emergency management, including notification in accordance with Roads and Maritime guidelines, response and clean-up procedures.	Contractor	Pre-construction / construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
WQ-5	Sedimentation/ decreased water quality	• The rehabilitation of disturbed areas will be undertaken progressively as construction stages are completed, and in accordance with: – Landcom's *Managing Urban Stormwater: Soils and Construction* series – Roads and Maritime Guideline for Batter Stabilisation Using Vegetation (RMS, 2015a)	Contractor	Construction	1 and 2
WQ-6	Disturbance of contaminated soil / contamination of environment	• Emergency spill kits will be kept at areas identified as having spill risk at all times.	Contractor	Construction	1 and 2
WQ-7	Contamination of surface waters and groundwater	• Refuelling will not take place within 50m of waterways, and will occur in a suitably located and bunded area.	Contractor	Construction	1 and 2
WQ-8	Contamination of surface waters and groundwater	• Washdown of plant, equipment and vehicles will occur in a designated bunded area away from waterways and drainage lines	Contractor	Construction	1 and 2
TGS-1	Acid sulfate rock	• Geotechnical testing will be carried out to assess the likelihood that cuttings will be through acid sulfate rock, and the potential this will have to generate acid leachate. If present, acid sulfate rock will be managed in accordance with the Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock and Monosulfidic Black Ooze (RTA, 2005).	Contractor	Detailed design	1 and 2
TGS-2	Management of excess or	• A Waste Management Plan will be prepared and implemented as part of the CEMP. The plan will identify the locations of spoil	Contractor	Pre-construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
	unsuitable material	stockpiles, and methods to reuse or dispose of excess or unsuitable spoil material including estimated volumes and disposal sites			
TGS-3	Soil erosion	• Areas of high erosion risk, such as steep areas or highly erodible soils, will be identified during the development of the site specific erosion and sediment control plan and appropriate management controls implemented.	Contractor	Construction	1 and 2
TGS-4	Soil erosion	• A registered Soil Conservation Consultant will be engaged during construction to advise on the types of controls required in areas of high erosion risk. The Soil Conservation Consultant will undertake regular inspections and surveillance of the work to ensure that erosion and sediment controls are being implemented and maintained	Contractor	Construction	1 and 2
TGS-5	Soil erosion	• Stockpiles will be designed, established, operated and decommissioned in accordance with the Roads and Maritime's Stockpile Site Management Guideline 2015 (RMS, 2015b).	Contractor	Construction	1 and 2
TGS-6	Soil erosion	• Stockpile management will consider the following: – On relatively level ground and up-slope of sediment control barriers – Have ready access to the road network or direct access to the construction corridor – Away from areas of ecological and heritage conservation value – In areas previously disturbed within the proposal area that do not require the clearing of native vegetation – Away from residential buildings – At least 5m clear of all areas of possible concentrated water flow and at least 10m from a waterway (any Class 1 or Class 2	Contractor	Construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
		fish habitat waterways as described in the NSW Fisheries guidelines) – Limit topsoil stockpile height to 2m where practical – Cover or otherwise protect from erosion, stockpiles that will be in place for more than 20 days as well as any stockpiles that are susceptible to wind erosion, within 10 days of forming each stockpile.			
TGS-7	Soil erosion	• Activities will be planned and sequenced to minimise the length of time disturbed soil remains exposed, and limit the time of soil stockpile storage before the material is reused or removed from the site.	Contractor	Construction	1 and 2
TGS-8	Soil erosion	• Consistent with any specific requirements of the approved erosion and sediment control plan, a monitoring program will be implemented during construction to ensure effective implementation of all temporary and permanent soil, erosion and water pollution safeguards. The timing and frequency of monitoring inspections will be set out in the plan. The inspections will assess implementation and success of the controls, actions required to ensure on-going effective operation, and compliance with any statutory approvals. A register of inspections will be established.	Contractor	Construction	1 and 2
TGS-9	Disturbance of contaminated soil / contamination of environment	• Visual inspections will be undertaken during excavation activities to ensure no waste material from dumping is present. If encountered, stockpile separately from other spoil. An unexpected finds procedure will be developed as part of the Waste Management Plan.	Contractor	Construction	1 and 2
TGS-10	Disturbance of contaminated	• If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the	Contractor	Construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
	soil / contamination of environment	immediate risks of contamination. All other work that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with ~~the~~ Roads and Maritime ~~Environment Manager~~ and/or EPA.			
TGS-11	Disturbance of contaminated soil / contamination of environment	• Prior to the acceptance of any soil onsite (regardless of volume), the following actions must be taken to reduce the risk of receiving contaminated material: – Ensure that all fill used is virgin excavated natural material (eg clay, gravel, sand, soil or rock) that is not mixed with any other waste – Request the supplier provides formal certification that the fill material is clean VENM – Request the supplier provide information on what activities previously occurred onsite where there fill was sourced – Check for signs of contamination, such as odours (chemical/petrol), staining from chemicals, and rubbish such as bricks, timber, masonite, etc – Supervise the delivery of the material to ensure the material received matches the material ordered – Material from a known or potentially contaminated site must not be accepted without EPA approval – Maintain all documents and records.	Contractor	Construction	1 and 2
TGS-12	Disturbance of contaminated soil / contamination of environment	• Hazardous materials such as fuel and chemicals will be stored in suitably located and bunded areas, in accordance with DECC's *Storing and Handling Liquids: Environmental Protection Participants Manual* (DECC, 2007).	Contractor	Construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
B-1	Removal of vegetation / fauna habitat	• Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design and implemented where practicable and feasible.	Contractor	Detailed design	1 and 2
B-2	Removal of vegetation / fauna habitat	• Pre-clearing surveys will be undertaken in accordance with Guide 1: Preclearing process of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Construction	1 and 2
B-3	Biodiversity impacts	• A Flora and Fauna Management Plan will be prepared in accordance with Roads and Maritime's *Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects* (RTA, 2011) and the biodiversity and aquatic assessments prepared for the proposal (RPS, 2016) The Plan will be implemented as part of the CEMP, and will include an induction program for construction personnel on the management of biodiversity values.	Contractor	Pre-construction	1 and 2
B-4	Removal of vegetation / fauna habitat	• Vegetation and habitat removal will be undertaken in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Pre-construction / construction	1 and 2
B-5	Removal of vegetation / fauna habitat	• The unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) if threatened ecological communities or species, not assessed in the biodiversity assessment, are identified in the proposal site.	Contractor	Pre-construction / construction	1 and 2
B-6	Removal of vegetation / fauna habitat	• Exclusion zones will be set up at the limit of clearing in accordance with Guide 2: Exclusion zones of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Pre-construction / construction	1 and 2
B-7	Habitat loss and	• Fauna will be managed in accordance with Guide 9: Fauna	Contractor	Pre-construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
	fauna mortality	handling of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).		/ construction	
B-8	Introduction of weeds and pests	• Weed species will be managed in accordance with Guide 6: Weed management of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Pre-construction / construction	1 and 2
B-9	Introduction of weeds and pests	• Pest species will be managed within the proposal site.	Contractor	Pre-construction / construction	1 and 2
B-10	Introduction of weeds and pests	• Pathogens will be managed in accordance with Guide 2: Exclusion zones of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Pre-construction / construction	1 and 2
B-11	Impacts on Dargans Creek	• Aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) and Section 3.3.2 Standard precautions and mitigation measures of the *Policy and guidelines for fish habitat conservation and management Update 2013* (DPI (Fisheries NSW) 2013).	Contractor	Pre-construction / construction	1 only
B-12	Removal of vegetation / fauna habitat	• Native vegetation and habitat will be re-established in accordance with Guide 3: Reestablishment of native vegetation of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011), Guide 5: Reuse of woody debris and bushrock and Guide 8: Nest boxes of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011)	Contractor	Operation	1 and 2
B-13	***Removal of vegetation / fauna habitat***	• ***Clearing of native vegetation (particularly mature trees) within Ancillary Site 3 will be limited to the minimum required to achieve safe access for vehicles and construction plant***	***Contractor***	***Construction***	***1 only***
B-14	***Removal of***	• ***Design options to allow retention of the hollow bearing tree***	***Contractor***	***Pre-***	***1 only***

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
	vegetation / fauna habitat	***HBT1 in the eastern part of the project area will be reviewed. If the subject tree can be retained, temporary fencing/bunting will be established at the outer limits of this plant's drip line and no vehicles or machinery will be stored or parked within this area. A no-go sign will also be established on the temporary fencing/bunting.***		***construction***	
B-15	***Impacts on endangered ecological communities***	• ***Sedimentation fencing/bunding and exclusion fencing will be established along the northern perimeter of the Ancillary Site 3 to safeguard against potential impacts to the adjacent Newnes Plateau Shrub Swamp endangered ecological community.***	***Contractor***	***Pre-construction***	***1 only***
B-16	***Cumulative impacts on threatened ecological communities***	• ***The construction footprint for Stage 2 will be reviewed and minimised where possible. The need for biodiversity offsets for the project, Stage 1 and Stage 2 cumulatively, would be identified in accordance with the Guideline for Biodiversity Offsets (Roads and Maritime Services, 2011) during Stage 2 detailed design.***	***Roads and Maritime***	***Detailed design***	***2 only***
TR-1	Changes to local access arrangements	• Requirements for any changes to local access arrangements, including to the Ex-POW Memorial will be confirmed during detailed design.	Contractor	Detailed design	1 and 2
TR-2	Changes to traffic conditions	• A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP in accordance with the Roads and Maritime Traffic Control at Work Sites Manual and Roads and Maritime Specification G10. The TMP will include: – Confirmation of haulage routes. – Measures to maintain access to local roads and properties – Site specific traffic control measures (including signage) to manage and regulate traffic movement	Contractor	Pre-construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
		– Measures to maintain pedestrian and cyclist access – Requirements and methods to consult and inform the local community of impacts on the local road network – Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads – Measures to maintain fire trail access – A response plan for any construction traffic incident – Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic – Monitoring, review and amendment mechanisms.			
TR-3	Changes to traffic conditions	• Consultation will be undertaken with potentially affected residences prior to the commencement of and during work in accordance with the RTA's Community Involvement and Communications Resource Manual. Consultation will include but not limited to door knocks, newsletters or letter box drops providing information on the proposed work working hours and a contact name and number for more information or to register complaints.	Roads and Maritime / contractor	Pre-construction / construction	1 and 2
TR-4	Changes to traffic conditions	• Road users and local communities will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities.	Contractor	Construction	1 and 2
TR-5	Disruption to school bus services	• Access for public transport services, including school bus services, will be maintained. The requirements for any temporary changes will be confirmed following consultation with local bus operators and the community.	Roads and Maritime / contractor	Construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
TR-6	Changes to property access during work	• Access to properties will be maintained during construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners.	Contractor	Construction	1 and 2
TR-7	Changes to maintenance access tracks during work	• Maintenance access tracks will be maintained during construction. Where this is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected stakeholders.	Contractor	Construction	1 and 2
NV-1	Construction noise and vibration	• A Noise and Vibration Management Plan will be prepared and implemented as part of the CEMP. The Plan will generally follow the approach in EPA's Interim Construction Noise Guideline (ICNG) and identify: – All potential significant noise and vibration generating activities associated with the activity – Feasible and reasonable mitigation measures to be implemented, taking into account the Roads and Maritime Beyond the Pavement urban design policy, process and principles and site specific mitigation options detailed in the noise assessment (Wilkinson Murray, 2016) – A monitoring program to assess performance against relevant noise and vibration criteria – Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures – Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.	Contractor	Pre-construction	1 and 2
NV-2	Construction noise and vibration	• All personnel working on site will receive training to ensure awareness of requirements of the Noise and Vibration Management Plan. Site-specific training will be given to personnel	Contractor	Pre-construction / construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
		when working in the vicinity of sensitive receivers.			
NV-3	Construction noise and vibration	• Any variations to the standard construction hours will follow the approach in Roads and Maritime Services Construction Noise and Vibration Guideline, including consultation with the affected local community.	Contractor	Construction	1 and 2
NV-4	Construction noise and vibration	• All sensitive receivers (eg local residents) likely to be affected will be notified at least five working days prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The notification will include details of: the project; construction period and construction hours; contact information for project management staff; complaint and incident reporting; and how to obtain further information.	Contractor	Construction	1 and 2
NV-5	Construction noise and vibration	• Specific measures to manage blasting, if required at Scenic Hill will be included in the Noise and Vibration Management Plan including: – Recommended blast sizes consistent with that detailed in the noise assessment (Wilkinson Murray, 2016) – An overpressure monitoring program to assess performance against relevant blasting criteria – Exclusion zones for the section of Chifley Road within 500m of blasting activities – Management of livestock close to blast sites.	Contractor	Construction	2 only
AH-1	Unexpected find of Aboriginal heritage artefact or site	• The Standard Management Procedure - Unexpected Heritage Items will be followed in the event that a known or potential Aboriginal object(s), including skeletal remains, is found during construction. This applies where Roads and Maritime does not have approval to disturb the object(s) or where a specific safeguard for managing the disturbance (apart from the	Contractor	Pre-construction/ Construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
		Procedure) is not in place. Work will only re-commence once the requirements of that Procedure have been satisfied.			
AH-2	Unexpected find of Aboriginal heritage artefact or site	• All personnel working on site will be provided with environmental training to achieve a level of competence and awareness of the environmentally issues associated with Aboriginal heritage, including the need to protect these areas. Training will include the application of the Standard Management Procedure - Unexpected Heritage Items.	Contractor	Pre-construction/ Construction	1 and 2
NA-1	Impact on non-Aboriginal heritage items from the work	• Impact to the outlet of site CRC 02 will be minimised through deployment of sufficient and suitable separation fabric, plumbers sand or other similar method at the interface of the outlet.	Contractor	Detailed design/ preconstruction/ construction	1 only
NA-2	Impact on non-Aboriginal heritage items from the work	• ~~Damage to the unburied portion of site CRC 03 will be avoided where practical.~~ ***An exclusion zone in relation to the portion of heritage item CRC03 to be retained is to be delineated by survey, marked on site and shown on construction drawings. Vehicles and plant are not to access the portion of CRC03 to be retained. Visual access to the CRC03 is to be maintained during construction to prevent inadvertent access/damage.***	Contractor	Pre-construction/ Construction	1 only
NA-3	Impact on non-Aboriginal heritage items from the work	• A Non-Aboriginal Heritage Management Plan will be prepared and implemented as part of the CEMP and will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to Non-Aboriginal heritage. The Plan will include, but not be limited to: – Details of investigations completed or planned to be undertaken and any associated approvals required – Mapping of areas of non-Aboriginal heritage value and identification of protection measures to be applied during	Contractor	Pre-construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
		construction – Procedures to be implemented if previously unidentified non-Aboriginal relics or heritage items are discovered during construction, in accordance with the Roads and Maritime Standard Management Procedure - Unexpected Archaeological Finds – Procedures to be followed in the management of sites CRSH 06, CRSH 17 and CRSH 18 – An induction program for construction personnel on the management of non-Aboriginal heritage values			
NA-4	Impact on non-Aboriginal heritage items from the work	• An archival recording will be prepared of sites CRC 01 and CRC 02 prior to demolition and removal. The recording will be prepared in accordance with guidelines published by the Office of Environment and Heritage	Contractor	Pre-construction/ Construction	1 only
NA-5	Impact on non-Aboriginal heritage items from the work	• An archival recording will be prepared of sites CRSH 06, CRSH 17 and CRSH 18 prior to any work being undertaken that affects the item. The recording will be prepared in accordance with guidelines published by the Office of Environment and Heritage. These sites should be re-inspected and recorded by an archaeologist and after the area has been cleared of vegetation. Care should be taken during clearance minimise the amount of ground disturbance in this area	Contractor	Pre-construction/ Construction	2 only
NA-6	Unexpected find of non-Aboriginal heritage artefact or site	• All personnel working on site will receive training to ensure awareness of requirements of the Non-Aboriginal Heritage Management Plan and relevant statutory responsibilities. Site-specific training will be given to personnel when working in the vicinity of identified Non-Aboriginal heritage items.	Contractor	Pre-construction/ Construction	1 and 2
NA-7	Impact on non-	• Exclusion zones will be established around sites CRC 19, CRC	Contractor	Pre-construction/	1 only

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
	Aboriginal heritage items from the work	21, CRC 23 and CRC 25 to prohibit vehicle movement and minimise impact when clearing vegetation.		Construction	
NA-8	Unexpected find of non-Aboriginal heritage artefact or site	• Should any heritage items, archaeological remains or potential relics of non-Aboriginal origin be encountered, then construction work that might affect or damage the material will cease and notification provided to the relevant Roads and Maritime officer identified in the Roads and Maritime Standard Management Procedure - Unexpected Archaeological Finds. Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Construction	1 and 2
NA-9	***Impact on non-Aboriginal heritage items from the work***	• ***An archaeologist is to record the exposed face or section of the formation after the formation has been cleared of vegetation and excavation of the affected section has occurred. The recording will include measured drawings and photography. The objective of the recording is to document how the formation was constructed and what materials were used.***	***Contractor***	***Construction***	***1 only***
NA-10	***Impact on non-Aboriginal heritage items from the work***	• ***The ballast that comprises the section of the formation to be retained is to be protected by an exclusion zone and will not be used for any aspect of the project.***	***Contractor***	***Construction***	***1 only***
LCV-1	Quality of structures	• Design the proposed Clarence road over rail bridge according to the Roads and Maritime – Bridge Aesthetics Design Guidelines.	Roads and Maritime	Detailed design	1 only
LCV-2	Integration of earthworks design with	• Minimise visual impact of earthworks and associated structures through rounding off top of cut batters, tailing off cut batters and flattening of grades at the ends of fill embankments where feasible	Roads and Maritime	Detailed design	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
	existing landform				
LCV-3	Integration of earthworks design with existing landform	• Design retaining walls to utilise visually recessive materials and colours. The design should aim to minimise the construction footprint and extent of vegetation clearance.	Contractor	Detailed design	1 and 2
LCV-4	Integration of earthworks design with existing landform	• Use screen planting to minimise visual dominance of retaining walls and use sculpted shotcrete finishes to blend the structure with surrounding rock cuttings where possible	Contractor	Construction	1 and 2
LCV-5	Minimisation of road furniture and signage	• Coordinate signage locations with other roadside elements including structures, furniture, fencing and landscape treatment.	Roads and Maritime	Detailed design	1 and 2
LCV-6	Use of soft engineering	• Avoid the use of concrete-lined drainage channels where practical, and utilise vegetated or rock lined channels where possible. If concrete lined channels are used, ensure the concrete is coloured and/or heavily roughened.	Contractor	Detailed design	1 and 2
LCV-7	Use of soft engineering	• Maintain drainage structures where required, noting that revegetation and darkening are emphasised as a positive outcome from an urban design perspective.	Roads and Maritime	Operation	1 and 2
LCV-8	Retention of vistas	• Prepare and implement a landscape and revegetation plan for the proposal.	Contractor	Detailed design	1 and 2
LCV-9	Retention of vistas	• Maintain important vistas during maintenance regimes. Do not remove vegetation in revegetation areas associated with screening unless within clear zones.	Roads and Maritime	Operation	1 and 2
SE-1	Property acquisition	• All property acquisition will be carried out in accordance with the Land Acquisition Information Guide (RMS, 2012c) and the *Land*	Roads and Maritime	Detailed design/ Preconstruction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
		Acquisition (Just Terms Compensation) Act 1991.			
SE-2	Changes to road access and/or conditions during the work.	• Consultation will occur with Clarence Colliery mine and Hanson Quarry to identify appropriate management strategies to avoid or minimise impacts on access and operations. This will include consideration of measures such as additional signage and alternative access arrangements	Roads and Maritime / contractor	Detailed design/ Preconstruction	1 only
SE-3	Changes to road access and/or conditions during the work	• A Communication Plan (CP) will be prepared and implemented as part of the CEMP to ensure provision of timely and accurate information to the community during construction. The CP will include (as a minimum): – Mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions – Contact name and number for complaints. The CP will be prepared in accordance with the Roads and Maritime *Community Involvement and Communications Resource Manual*.	Contractor	Pre-construction / construction	1 and 2
SE-4	Management of community inquiries or complaints	• A complaints handling procedure and register will be included in the CEMP	Contractor	Construction	1 and 2
SE-5	Emergency access	• Access for emergency vehicles will be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency	Contractor	Construction	1 and 2
SE-6	Disruption to utilities and	• Persons and organisations likely to be affected by utility related work (eg disruption to services) will be notified at least five days	Contractor	Construction (prior to any	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
	services	prior to commencement of any such work. In the notification include details of: the project; work period and work hours; period of utility service disruption; contact information for project management staff; complaint and incident reporting; and how to obtain further information.		utility work)	
AQ-1	Particulate matter and emission	• Air quality management measures will be prepared and implemented as part of the CEMP. The measures will include: – Mitigation and suppression measures to be implemented, such as spraying or covering exposed surfaces, provision of vehicle clean down areas, covering of loads, street cleaning, use of dust screens, maintenance of plant in accordance with manufacturer's instructions – Methods to manage work during strong winds or other adverse weather conditions.	Contractor	Pre-construction / construction	1 and 2
WA-1	Generation of construction waste	• Prior to land being used for ancillary construction purposes (compounds, storage, parking, etc) a pre-construction land assessment will be undertaken to identify the presence of any pre-existing wastes. The assessment will be prepared in accordance with the Roads and Maritime Environmental Procedure - Management of Wastes on Roads and Maritime Services Land. Where the land is privately owned, a copy of the assessment will be provided to the landowner.	Contractor	Pre-construction	1 and 2
WA-2	Generation of construction waste	• A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The Plan will be prepared taking into account the Roads and Maritime Environmental Procedure - Management of Wastes on Roads and Maritime Services Land and relevant Roads and Maritime Waste Fact Sheets. It will include, but not be limited to: – Measures to avoid and minimise waste associated with the	Contractor	Design/ preconstruction/ construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
		project – Measures to identify potential asbestos on site – Classification of wastes and management options (re-use, recycle, stockpile, disposal) including for asbestos containing material – Statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions Procedures for handling, storage, transport and disposal of waste – Monitoring, record keeping and reporting requirements.			
WA-3	Generation of construction waste	• Waste materials (such as soils and aggregates) obtained from the project and to be exported to a non-road construction site or project will be sampled and managed in accordance with relevant Roads and Maritime Waste Fact Sheets.	Contractor	Construction	1 and 2
WA-4	Generation of construction waste	• No burning of timber or other materials will occur, other than vegetation debris that is unsuitable for any other purpose, and subject to any necessary approval of the local council and/or EPA, and provision of any required notification to the Rural Fire Service. No burns will be undertaken during total fire bans.	Contractor	Construction	1 and 2
WA-5	Generation of construction waste	• Any trees to be removed will be reused as millable timber wherever practicable. Other vegetated material from native species will be mulched and re-used on-site for landscaping or rehabilitation purposes if consistent with the approved Flora and Fauna Management Plan for the project. Weed species, or vegetation not considered appropriate for re-use on-site, will be removed and disposed of to an appropriately licenced facility.	Contractor	Construction	1 and 2
WA-6	Generation of construction	• Asbestos waste will be removed from the site and disposed of to an appropriately licenced facility and in accordance with the Waste	Contractor	Construction	1 and 2

No.	Impact	Environmental safeguards	Responsibility	Timing	Stage
	waste	Management Plan for the project.			
WA-7	Generation of construction waste	• A post-construction land assessment will be undertaken of land that was used for ancillary construction purposes (compounds, storage, parking, etc) to determine the suitability for hand-back to the landowner. The assessment will be prepared in accordance with the Roads and Maritime Environmental Procedure - Management of Wastes on Roads and Maritime Services Land. Where the land is privately owned, a copy of the assessment will be provided to the landowner.	Contractor	Construction	1 and 2
WA-8	Generation of construction waste	• Appropriate housekeeping will be undertaken at the construction site and project sites will be maintained free of litter at all times	Contractor	Construction	1 and 2
C-1	Changed traffic conditions	• The construction timetable, and phasing of major construction activities associated with the proposal and other developments including the upgrades to the Great Western Highway and Bells Line of Road will be coordinated and managed to avoid peak travel periods.	Roads and Maritime / contractor	Construction	1 and 2

7.3 Licensing and approvals

Section 5.3 of the submissions report details the licenses, permits, notifications and/or approvals that are required for the project. No additional requirements have been identified for the proposed modification.

8. Conclusion

8.1 Justification

The proposed modification is needed to allow the staged delivery of the project to align with available funding. It also addresses requirements arising from the detailed design and construction planning process.

While there would be some additional environmental impacts as a consequence of the proposed modification including further impacts on an identified heritage item, they have been avoided or minimised wherever possible through design and the site-specific safeguards summarised in Chapter 7. It is noted that the proposed modification reduces overall vegetation clearing and further reduces nutrient and pollutant loads when compared to the existing situation.

The benefits of the proposed modification are considered to outweigh the temporary adverse impacts and risks.

8.2 Objects of the EP&A Act

Table 8-1 identifies the objects of the EP&A Act and their relevance to the proposed modification.

Table 8-1: EP&A Act objects

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The proposed modification has only minor additional impacts and reduces impacts on native vegetation and water quality. The proposed safeguards and management measures detailed in this addendum REF allow for the proper management, development and conservation of natural and artificial resources.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	The consideration of ecologically sustainable development provided in Section 8.3 of the project REF is applicable to the proposed modification.
1.3(c) To promote the orderly and economic use and development of land.	The project, inclusive of the proposed modification, would improve access to industrial and commercial land use in the local area, and between Sydney and the central west of NSW.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the project.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	Impacts of the project, inclusive of the proposed modification, have been assessed as not significant. The proposed modification reduces overall native vegetation clearing.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	Additional non-Aboriginal heritage impacts have been assessed as minor. The proposed modification is not expected to affect Aboriginal cultural heritage.

Object	Comment
1.3(g) To promote good design and amenity of the built environment.	The project includes measures to ensure the quality of structures, the integration of earthworks design with existing landform and minimisation of visual impacts. Refer to safeguards LCV-1 to LCV-9 in Table 7-1.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the project.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the project.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Community and stakeholder consultation for the project is discussed in Chapter 5 of the project REF and in the submissions report. Given the minor nature of the proposed modification, further community consultation was not considered necessary. The updated timing for the Clarence Bridge and Scenic Hill components of the project has been communicated via the Roads and Maritime website.

8.3 Conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration where relevant, of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the addendum REF best meets the project objectives, but would still result in some impacts on minor additional impacts on non-Aboriginal heritage. Safeguards and management measures as detailed in this addendum REF would ameliorate or minimise these expected impacts. The proposed modification would also reduce overall native vegetation clearing further reduce nutrient and pollutant loads when compared to the existing situation. On balance the proposed modification is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF [also refer to the submissions report and any other previous addendum REFs if relevant] and would be unlikely to cause a significant impact on the environment. Therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The

proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Department of the Environment and Energy is not required.

9. Certification

This addendum review of environmental factors provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.

Stuart Hill

Environmental Planner

Hills Environmental

Date: 30 August 2018

I have examined this addendum review of environmental factors and accept it on behalf of Roads and Maritime Services.

Sivapatham Aruneswaran

Project Manager

Project Delivery | Outer Urban, Great Western Highway & West

Date: 31/08/2018.

10. References

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Terms and acronyms used in this addendum REF

Term / Acronym	Description
BC Act	*Biodiversity Conservation Act 2016* (NSW).
CEMP	Construction / Contractor's environmental management plan
EIA	Environmental impact assessment
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
PEMP	Project Environmental Management Plan
Roads and Maritime	NSW Roads and Maritime Services
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
TSC Act	*Threatened Species Conservation Act 1995* (NSW)
QA Specifications	Specifications developed by Roads and Maritime Services for use with road work and bridge work contracts let by Roads and Maritime Services.

Appendix A

Consideration of clause 228(2) factors and matters of national environmental significance

Clause 228(2) Checklist

In addition to the requirements of the *Is an EIS required?* (1995/1996) guideline and the *Roads and Related Facilities EIS Guideline* (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in clause 228(2) of the Environmental Planning and Assessment Regulation 2000, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
a. Any environmental impact on a community? The proposed modification would not have any impact on a community.	Nil
b. Any transformation of a locality? The proposed modification would not transform a locality.	Nil
c. Any environmental impact on the ecosystems of the locality? The proposed modification would have some impact on the ecosystems of the locality, due to additional clearing within Ancillary Site 3 and at Rail Access 1. The overall loss of native vegetation would however be reduced. Additional safeguards have been proposed to address the potential impacts associated with the proposed modification. Refer to Section 6.1.4.	Short-term minor negative
d. Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The proposed modification is not expected to reduce the aesthetic, recreational, scientific or other environmental quality or value of the locality.	Nil
e. Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The proposed removal, rather than burial of the eastern extent of locally significant heritage item CRC03 (former railway formation) would have minor impact on the significance of the item. Safeguards have been proposed to address the potential for more extensive impacts on this item. Refer to Section 6.2.4.	Long-term minor negative
f. Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act* 1974)? Fauna recorded at the site would not be solely reliant upon the habitats present such that the removal or further disturbance of these would threaten the occurrence of these animals. The species recorded are all expected to be present at both the site and within the surrounding locality post-development.	Short-term minor negative
g. Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The proposed modification would not endanger any species of animal, plant or other form of life.	Nil
h. Any long-term effects on the environment? In the long term, there would be negligible changes to the locality from the current status. The land use of the area would be consistent, and the area of additional vegetation clearance required for construction negligible in the context of the surrounding area.	Long-term negligible
i. Any degradation of the quality of the environment? In the short term the proposal has the potential to degrade the environment in the area immediately surrounding the proposed modification site, through erosion and	Short-term minor negative Long-term negligible

Factor	Impact
runoff, accidental spills and construction noise. Table 7-1 details safeguards and management measures to manage these impacts. With effective implementation of the measures, most impacts would be minor or negligible.	
j. Any risk to the safety of the environment? The proposed modification does not pose a risk to the safety of the environment.	Nil
k. Any reduction in the range of beneficial uses of the environment? The proposed modification would not reduce the range of beneficial uses of the environment.	Nil
l. Any pollution of the environment? In the short term the proposal has the potential to degrade the environment in the area immediately surrounding the proposed modification site, through erosion and runoff, accidental spills and construction noise. Table 7-1 details safeguards and management measures to manage these impacts. With effective implementation of the measures, most impacts would be minor or negligible.	Short-term minor negative Long-term negligible
m. Any environmental problems associated with the disposal of waste? The proposed modification has no identified problems associated with the disposal of waste.	Nil
n. Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The proposed modification would not place any increased demand on resources, natural or otherwise, that are or are likely to become in short supply.	Nil
o. Any cumulative environmental effect with other existing or likely future activities? Given the location and scale of the proposed modification, cumulative impacts are not expected.	Negligible
p. Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? There would be no impact to coastal processes or hazards.	Nil

Matters of National Environmental Significance

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of the Environment and Energy.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
a. Any impact on a World Heritage property? The proposed modification is not within or adjacent to a World Heritage Property.	Nil
b. Any impact on a National Heritage place? The proposed modification is not within or adjacent to a National Heritage Place.	Nil
c. Any impact on a wetland of international importance? The proposed modification is not within or adjacent to a wetland of international importance.	Nil
d. Any impact on a listed threatened species or communities? Potential impacts on Commonwealth threatened species have been assessed (refer to Section 6.1.3). The proposed modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the EPBC Act. Safeguards have been proposed to address potential impacts (refer to Section 6.1.4).	Not significant
e. Any impacts on listed migratory species? The proposed modification is not expected to affect Commonwealth listed migratory species or their habitats.	Not significant
f. Any impact on a Commonwealth marine area? The proposed modification would not affect a Commonwealth marine area.	Nil
g. Does the proposed modification involve a nuclear action (including uranium mining)? The proposed modification is not a nuclear action.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The proposed modification would not affect Commonwealth land.	Nil

Appendix B

Statutory consultation checklists

ISEPP

Council related infrastructure or services

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	ISEPP clause
Stormwater	Are the works likely to have a *substantial* impact on the stormwater management services which are provided by council?	No		ISEPP cl.13(1)(a)
Traffic	Are the works likely to generate traffic to an extent that will *strain* the capacity of the existing road system in a local government area?	No		ISEPP cl.13(1)(b)
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a *substantial* impact on the capacity of any part of the system?	No		ISEPP cl.13(1)(c)
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a *substantial* volume of water?	No		ISEPP cl.13(1)(d)
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a *minor* or *inconsequential* disruption to pedestrian or vehicular flow?	No		ISEPP cl.13(1)(e)
Road & footpath excavation	Will the works involve more than *minor* or *inconsequential* excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	No		ISEPP cl.13(1)(f)

Local heritage items

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s)	ISEPP clause
Local heritage	Is there is a local heritage item (that is not	No		ISEPP

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s)	ISEPP clause
	also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than *minor* or *inconsequential*?	Impacts minor		cl.14

Flood liable land

Issue	Potential impact	Yes / No	If 'yes' consult with local Council(s)	ISEPP clause
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a *minor* extent?	No		ISEPP cl.15

Public authorities other than councils

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	No	Office of Environment and Heritage	ISEPP cl.16(2)(a)
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	Office of Environment and Heritage	ISEPP cl. 16(2)(b)
Aquatic reserves and marine parks	Are the works adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014*?	No	Department of Industry	ISEPP cl.16(2)(c)
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the *Sydney Harbour Foreshore Authority Act 1998*?	No	Sydney Harbour Foreshore Authority	ISEPP cl.16(2)(d)
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	ISEPP cl.16(2)(f)

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	ISEPP cl. 16(2)(g)
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhardt LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	No	Secretary of the Commonwealth Department of Defence	ISEPP cl. 16(2)(h)
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	No	Mine Subsidence Board	ISEPP cl. 16(2)(i)

Growth Centres SEPP

Issue	Potential impact	Yes / No	If 'yes' consult with	SEPP clause
Clearing native vegetation	Do the works involve clearing native vegetation (as defined in the *Local Land Services Act 2013)* on land that is not ***subject land*** (as defined in cl 17 of schedule 7 of the *Threatened Species Conservation Act 1995*)?	No	Department of Planning and Environment	SEPP 18A

Appendix C

Neutral or beneficial effect on water quality assessment

Neutral or Beneficial Effect Assessment

State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 relates to the use of land within the Sydney drinking water catchment. In accordance with Clause 12 of the SEPP, Roads and Maritime is required to consider whether or not an activity to which Division 5.1 of the EP&A Act applies will have a neutral or beneficial effect on water quality before carrying out the activity.

Factor	Impact
1. Are there any identifiable potential impacts on water quality? What pollutants are likely? During construction and/or post construction?	Refer to Appendix B of the project REF. Updated MUSIC modelling demonstrates that the detailed design (which includes the proposed modification) would further reduce total suspended solids, total phosphorus, total nitrogen and gross pollutant loads when compared to the existing situation. Refer to the results presented in the table below.
2. For each pollutant, list the safeguards needed to prevent or mitigate potential impacts on water quality (these may be WaterNSW endorsed current recommended practices and/or equally effective other practices)	Refer to Appendix B of the project REF.
3. Will the safeguards be adequate for the time required? How will they need to be maintained?	Refer to Appendix B of the project REF.
4. Will all impacts on water quality be effectively contained on the site by the identified safeguards (above) and not reach any watercourse, waterbody or drainage depression? Or will impacts on water quality be transferred outside the site for treatment? How? Why?	Refer to Appendix B of the project REF. Updated MUSIC modelling demonstrates that the detailed design (which includes the proposed modification) would further reduce total suspended solids, total phosphorus, total nitrogen and gross pollutant loads when compared to the existing situation. Refer to the results presented in the table below.
5. Is it likely that a neutral or beneficial effect on water quality will occur? Why?	Beneficial effect. Updated MUSIC modelling demonstrates that the detailed design (which includes the proposed modification) would further reduce total suspended solids, total phosphorus, total nitrogen and gross pollutant loads when compared to the existing situation. Refer to the results presented in the table below.

MUSIC modelling results under the concept design and the 100% detailed design

Parameter	Pre-development load	Project REF (concept design) post-development load	Post-development under 100% detailed design	Meets NoRBE at 100%? (Yes/No)	Change from Project REF (Yes/No)
Total Suspended Solids (kg/yr)	29,000	27,900	27,000	Yes	Yes
Total Phosphorus (kg/yr)	59.9	58.5	59.4	Yes	Yes
Total Nitrogen (kg/yr)	619	619	619	Yes	No
Gross Pollutants (kg/yr)	407	324	188	Yes	Yes

Source: Clarence Bridge road over rail bridge replacement project – Environmental Management Report (Arcadis, 2018)

Appendix D

Supplementary ecological investigation

Mr Stuart Hill
Director
Hills Environmental
PO Box 489
Moorebank NSW 1875

28 August 2018

Dear Stuart,

Supplementary ecology investigation, proposed Chifley Road Upgrade, NSW

1. Introduction and background

Based on the outcomes of discussions held with yourself, we are aware that NSW Roads and Maritime Services (RMS) are proposing to upgrade the1 section of Chifley Road that occurs between 5.3 kilometres (km) and 6.8 km west of Lithgow, New South Wales (NSW) (Figure 1), and that they require an addendum to the Review of the Environmental Factors (REF) (RPS Australia East Pty Ltd [RPS] 2016) that has already been prepared for the project.

It is noted that, at the time the REF was prepared, the design of the road had not yet been finalised and a works compound had not been included. This ecological assessment has therefore been prepared to consider and assess the ecological impact associated with the additional works not considered in the original REF.

The objectives of this study are:

- to survey and assess the ecological impacts associated with the clearing of the:
  - proposed site compound
  - a site referred to as 'Rail Access 1 area' (Figure 1).
- to conduct inspections for hollow-bearing trees (HBT) within any 'new' areas of the final road design limits (i.e. those not considered and surveyed during the course of the initial ecological study conducted by RPS 2016) (Figure 2).
- to determine whether offsetting is required referencing the RMS' Guideline for Biodiversity Offsets (2011), and if so, to calculate these in line with the requirements of the Biobanking scheme.

The site compound covers an area of around 1.235 hectares (ha), whilst the Rail Access 1 area is around 0.102 ha. Cumulatively, the area of disturbance would be 1.337 ha.

The locations of the site compound and Rail Access 1 area have been identified on Figure 1 and, combined, are hereafter referred to as the subject site. For the purpose of this investigation, study area is defined as 'the subject site and any additional areas that are likely to be affected by the proposal, either directly or indirectly' (Department of Environment and Climate Change 2007).

The 'new' areas of the final road design limits inspected for HBT's have been highlighted on Figure 2 and are hereafter referred to as the 'HBT inspection area'.

Not to scale Source: Google

Figure 1. Subject site (red line) and locality

2. Environmental setting

The subject site is located approximately 7.5 km east of the NSW township of Lithgow and is part of the Lithgow City Council Local Government Area. The site is present on the northern side of Chifley Road adjacent to the Zig Zag railway.

Given the past land use history of the site, and the establishment of the nearby railway and Chifley Road, the area investigated is highly modified. Whilst intact woodland occurs at the edges of the areas investigated, the majority of the subject site is predominantly cleared, with only some Wattle and Eucalypt regrowth occurring.

No major waterways are present within, or in close proximity to, the subject site. Whilst this is the case, a small unnamed drainage channel is present within the compound area, this containing no water at the time of the field investigation.

The subject site is part of an extant area of vegetation that extends in all directions and is part of the Great Dividing Range, incorporating a network of conservation reserves this including the Blue Mountains and Wollemi National Parks.

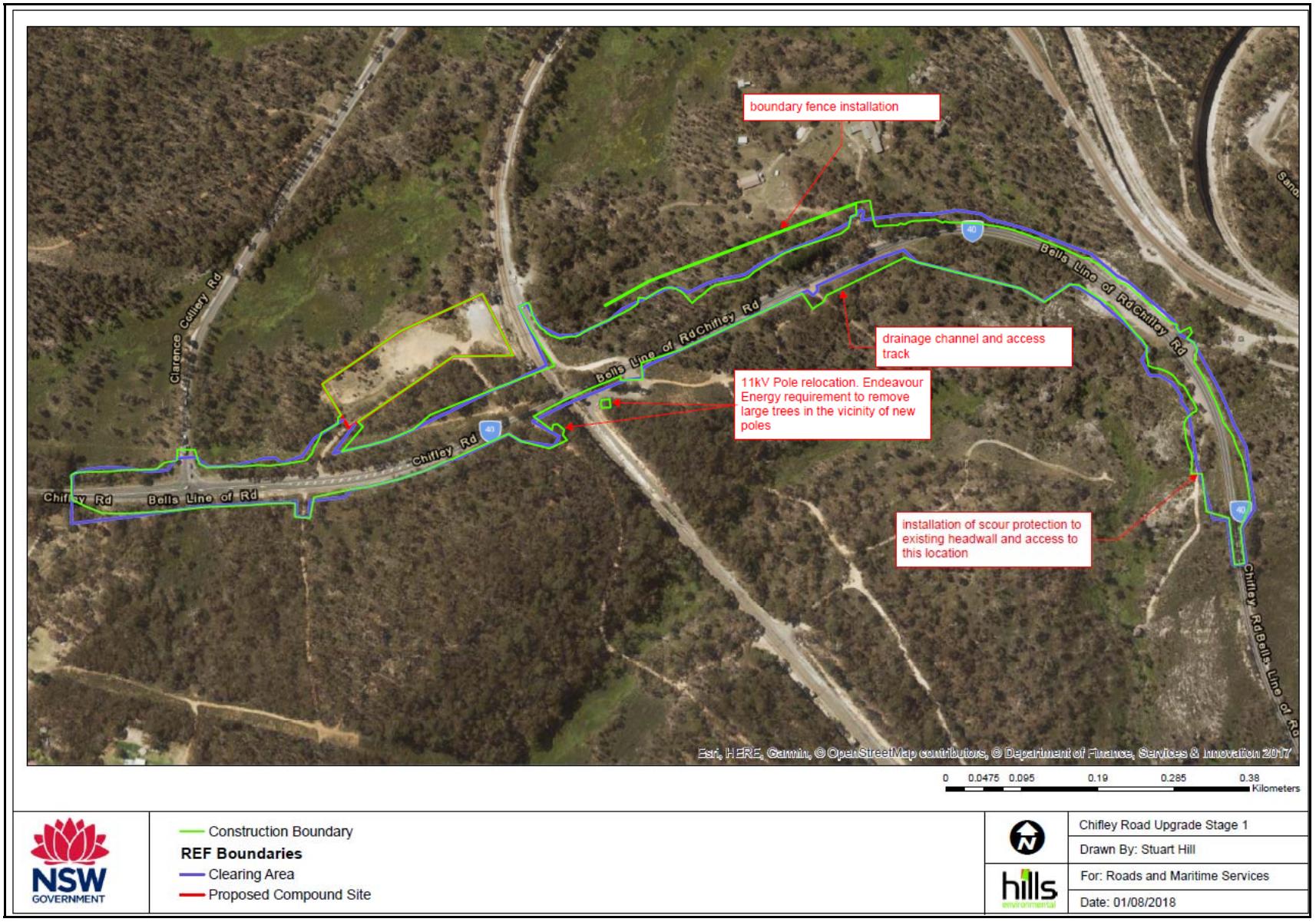

Figure 2. HBT inspection area (the areas between the clearing area and construction boundary)

3. Literature review

With reference to the initial ecological study conducted by RPS (RPS 2016), four threatened species and one threatened ecological community were recorded within the REF study area, these being:

- *Acacia meiantha* - listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and NSW *Biodiversity Conservation Act 2016* (BC Acts)
- Varied Sittella (*Daphoenositta chrysoptera*) - listed as vulnerable under the BC Act
- Diamond Firetail (*Stagonopleura guttata*) - listed as vulnerable under the BC Act
- Gang-gang Cockatoo (*Callocephalon fimbriatum*) - listed as vulnerable under the BC Act.

Potential habitat was also documented for the Eastern Pygmy-possum (*Cercartetus nanus*), this species being listed as vulnerable under the BC Act.

Acacia meiantha, Varied Sittella and Gang-gang Cockatoo were all recorded within approximately 150 metres of the subject site (Figures 3 and 4).

With reference to the NSW Department of Environment and Conservation (DEC) publication on the vegetation mapping of the Western Blue Mountains (DEC 2006) (Figure 5), the vegetation within, and close to, the subject site has been mapped as:

- Newnes Plateau Narrow-leaved Peppermint – Silver-top Ash Layered Open Forest
- Newnes Plateau Gum Hollows variant: Brittle Gum – Mountain Gum, Scribbly Gum – Snow Gum Shrubby Open Forest
- Sandstone Slopes Sydney Peppermint Shrubby Forest
- Newnes Plateau Shrub Swamp.

This mapping generally conforms to that identified by RPS (2016).

It is noted that Newnes Plateau Shrub Swamp is listed as endangered under the BC Act. It is also listed as endangered under the EPBC Act as Temperate Highland Peat Swamps on Sandstone. This community occurs immediately to the north of the subject site (Figure 5).

None of the other communities are listed, or currently being considered for listing, under the EPBC or BC Acts.

With reference to Office of Environment and Heritage's (OEH) Bionet Atlas several of the threatened species listed on this database occur in proximity to the subject site. Of note, *Persoonia acerosa*, listed as vulnerable under the EPBC and BC Acts, occurs in close proximity to the south-eastern boundary.

Figure 3. Location of *Acacia meiantha* (RPS 2016) (yellow oval - subject site [indicative only])

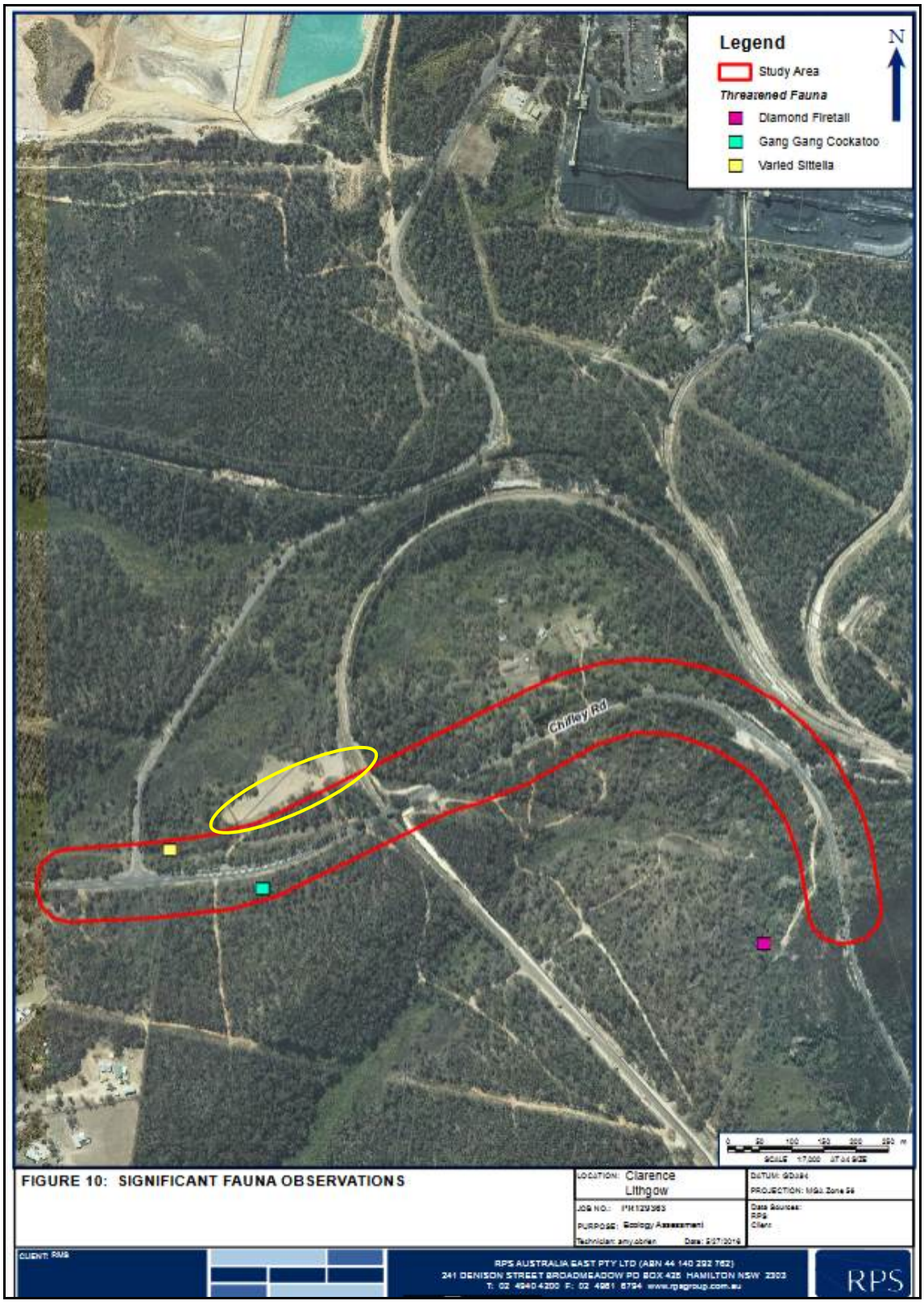

Figure 4. Threatened fauna locations (RPS 2016) (yellow oval - subject site [indicative only])

Figure 5. Vegetation mapping of the study area

3.1. Biodiversity value map and Biodiversity Offsets Scheme Entry Threshold

With reference to the Biodiversity Offsets Scheme Entry Threshold (BOSET) Tool, it has been identified that:

- the proposal is not expected to impact on any areas highlighted on the biodiversity values land map
- the area threshold for clearing of native vegetation is 0.25 ha.

Given that the proposal is expected to result in the loss of no more than 0.25 ha of native vegetation the proposed action does not need to be assessed in accordance with Part 6 (the Biodiversity Offsets Scheme) of the BC Act. Hence, the application of the Biodiversity Assessment Method (Division 2, Part 6 of the BC Act) is not required. Therefore, pending the outcomes of any assessments of significance[1] (Section 7.3 of the BC Act), the preparation of a Biodiversity Development Assessment Report (BDAR) does not need to be prepared as part of the proposal.

Should any assessment of significance determine the project has a significant impact on a threatened ecological community or species then a Species Impact Statement (SIS) must be prepared. As the project is being assessed under Part 5 of the EPA Act, in line with Section 7.8 of the BC Act, RMS can elect to prepare a BDAR rather than a SIS if they wish.

3. Site inspection and methodology

An ecological investigation of the subject site was undertaken by Stephen Bloomfield (B.App.Sc.) [Senior Ecologist] on 30 July 2018. An assessment of the HBT inspection area was undertaken on Wednesday 8 August 2018 by both Stephen Bloomfield and Deryk Engel (B.Env.Sc.HONS) [Director].

The weather conditions experienced during each investigation were:

- 30 July 2018 – clear skies, cold temperatures (6 °C) and strong winds. The site investigation commenced at 1030 hours and lasted for approximately 3.5 person hours.
- 8 August 2018 – overcast skies (50% cloud cover), cold temperatures (7 °C) and moderate winds. The inspection commenced at 0930 hours and lasted for approximately one person hour.

Based on the findings of the RPS ecological survey and the OEH Bionet records targeted investigations for those threatened flora and fauna species previously recorded within close proximity to the subject site, and their habitats, formed part of the site inspection.

During the investigation of the subject site, no limitations to achieving the objectives of the ecological survey were encountered. Access to all parts of the subject site was possible, thereby ensuring that all portions of the site were sampled. In addition, no adverse weather conditions or applicable seasonal variables were encountered during the investigation. The area proposed to be cleared is already highly disturbed due to its land use history.

Regarding the HBT inspection area, access proved to be a limitation pertaining to the boundary fence installation section (Figure 2). To overcome this limitation, given the open nature of the woodland at this location the presence of HBT was able to be determined from the road reserve.

It is acknowledged that the investigations were undertaken during the winter months, a time when some species would be absent, not visible (e.g. orchids) or hibernating. To overcome this limitation, should habitat be observed that is suitable for a State or Federally listed

[1] i.e. those undertaken on recorded (or potentially occurring based on the presence of suitable habitat) threatened species, populations, communities or their habitat.

threatened species that has been previously recorded in the study area, a precautionary approach was adopted.
Nocturnal work was not undertaken as this was:

a) beyond the scope of works required
b) unlikely to be beneficial, or consistent with standard survey guideline requirements, due to the winter timing of the investigation.

5. Results

5.1. Vegetation communities and habitat

The following descriptions should be read in conjunction with the photographic record provided in Attachment 1.

Rail Access 1 area

This area occurs adjacent to the rail access road and at the edge of a woodland. The area to be disturbed consists of cleared land with bare sand/gravel/dirt and a groundcover layer of vegetation comprised of native and exotic grasses, herbs and forbs. The occasional shrub and semi-mature tree may potentially be disturbed.

Common native species present include Mat Rush (*Lomandra longifolia*), Snowgrass (*Poa sieberiana* var. *sieberiana*), *Rytidosperma sp.*, Flax Lily (*Dianella sp.*), Sunshine Wattle (*Acacia terminalis*), *Persoonia sp.*, *Cassinia sp.* and Broad-leaved Peppermint (*Eucalyptus dives*).

Common introduced species include Pigeon Grass (*Setaria sp.*), Lamb's Tongue (*Plantago lanceolata*), Fleabane (*Conyza bonariensis*), Catsear (*Hypochaeris radicata*), Purple Top (*Verbena bonariensis*) and Blackberry (*Rubus fruticosus* agg. spp.).

No hollow-bearing trees are present, nor are any other habitat features that would be important for native animals (e.g. drainage lines, caves, rock outcrops).

Proposed site compound

This area is dominated by the regrowth of native saplings, shrubs and grasses with a large amount of bare ground. Common species include *Eucalypt spp.*, *Leptospermum spp.*, Sydney Golden Wattle (*Acacia longiflora* var. *longifolia*), *Cassinia sp.*, Laurel-leaf Grevillea (*Grevillea laurifolia*), Mat Rush, Purple Wiregrass (*Aristida ramosa*), *Austrostipa sp.* and Snowgrass.

Introduced species such as African Love Grass (*Eragrostis curvula*), Buffalo Grass (*Stenotaphrum secundatum*), Lamb's Tongue, Purple Top, Catsear and Blackberry are also present within the regrowth area and along the edges.

Along the edges of the proposed compound site is a stand of Narrow-leaved Peppermint (*Eucalyptus radiata*), Broad-leaved Peppermint and Brittle Gum (*Eucalyptus mannifera*), these reaching heights of 12 m to 15 m. Along the southern edge adjacent to the compound site access track, an understorey of native shrubs reaches around 1 m in height. Common species include Broom Spurge (*Amperea xiphoclada*), Hop Bitter-pea (*Daviesia latifolia*), Common Conesticks (*Petrophile pulchella*), Sydney Golden Wattle, *Persoonia sp.*, Paperbark Tea-tree (*Leptospermum trinervium*) and Wallum Heath (*Epacris pulchella*). The groundcover at this location is dominated by Laurel-leaf Grevillea, Blue Dampiera (*Dampiera stricta*), *Lomandra spp.*, *Rytidosperma sp.* and Flax Lily.

A small ephemeral drainage channel directs water in a northerly direction, however, no water was identified in this drainage channel at the time of the field investigation. The vegetation

present in association with this area is a high density of Mat Rush, Snowgrass, Laurel-leaf Grevillea and *Leptospermum spp*.

A small area of Silvertop Ash and Peppermints (*Eucalypt spp.*) is present within the south-eastern section of the compound site. The understorey and groundcover is similar to that described for the linear strip of trees present along the southern boundary. Additional species recorded in this area include Sunshine Wattle, Small-leaved Boronia (*Boronia microphylla*), Crinkle Bush (*Lomatia silaifolia*), Broad-leaf Geebung (*Persoonia levis*) and Bracken Fern (*Pteridium esculentum*).

5.1. (a) Conservation significance of the vegetation

The vegetation at the Rail Access 1 area is considered to conform to Newnes Plateau Narrow-leaved Peppermint - Silver-top Ash Layered Open Forest (DEC 2006), whilst the vegetation at the proposed compound site is considered to conform to Newnes Plateau Gum Hollows varient: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest (DEC 2006).

Neither of these communities are listed as, or considered to be a part of, a threatened ecological community identified under the EPBC or BC Acts.

In regards to those plants identified it is noted that none are listed, or currently being considered for listing, on the Schedules to either the EPBC or BC Acts. Similarly, none are of regional conservation significance or listed as a Rare or Threatened Australian Plant (RoTAP) (Briggs and Leigh 1996).

Whilst the subject site contains potential habitat for *Acacia meiantha*, targeted investigations failed to identify any individuals of this species. It is noted that, for reference and confirmation of habit/flowering status, its previous detection location (i.e. on the southern side of Chifley Road [Figure 3]) was visited and the individuals present inspected.

As *Acacia meianth* was not recorded in the subject site, and as neither of the communities detected are listed, or currently being considered for listing under the EPBC and/or BC Acts, no assessments of significance using the criteria provided under the EPBC Act's Significant Impact Guidelines or Section 7.3 of the BC Act have been undertaken.

No threatened fauna would rely on the subject site's habitat for any of their life cycle requirements. No threatened fauna would be adversely affected by the proposal.

It is noted that Newnes Plateau Shrub Swamp, listed as endangered under the BC Act and EPBC Act (as Temperate Highland Peat Swamps on Sandstone), occurs immediately north of the subject site (Figure 5). With adoption of those mitigation measures provided no direct or indirect impacts on this endangered ecological community are considered likely. As such, no assessments of significance using the criteria provided under the EPBC Act's Significant Impact Guidelines or Section 7.3 of the BC Act have been undertaken. If the recommendations proposed are not adopted a reconsideration of the potential impact on this community must be undertaken.

5.2. Species recorded

5.2.1. Flora

By the completion of the field survey 56 plants had been recorded within the area investigated, the majority of which are native species (Attachment 2). It is noted that Attachment 2 is not intended to be a comprehensive list of all the species present within the subject site, and only represents those plants that were recorded while undertaking searches for:

- those native species and ecological communities of State and/or national conservation concern that are known, or expected to occur, in the locality
- weeds of significance that would require treatment.

In regards to those terrestrial plants recorded, it is noted that none are:

- listed, or currently being considered for listing, on the Schedules to the EPBC or BC Acts
- identified as a RoTAP.

While targeted searches for those threatened plants known to occur within the study region were undertaken, none were recorded. Given the highly disturbed and modified nature of the subject site, as well as the locality's land use history, the area is not considered to contain suitable habitat for any of those threatened plants previously recorded within the surrounding region. It is considered unlikely that any of those listed threatened species that have been previously recorded in the surrounding region would be present within the subject site such that the undertaking of the proposal would have a significant effect on the viability of their local population.

As no threatened plants are considered to be adversely impacted by the proposal, the conducting of assessments referring to the EPBC Act's Significant Impact Guidelines and Section 7.3 of the BC Act is not required.

5.2.1. (a) Weeds

Under the NSW *Biosecurity Act 2015*, 'all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.'

Of those introduced species recorded, Blackberry is listed

- under Schedule 3 of the NSW Biosecurity Regulation 2017
- as a 'priority weeds' in the Central Tablelands region (which includes the Lithgow City Council LGA) (NSW Department of Primary Industries [DPI] 2018)
- as a Weeds of National Significance (WoNS) (DE 2018)[2].

Under the DPI listing, Blackberry has been assigned the following duties:

- Prohibition on dealings - Must not be imported into the State or sold
- Regional - Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.

The indicative location of where Blackberry was observed has been identified on Figure 6.

Where Blackberry occurs on site, it must be controlled to result in its suppression. This should be done prior to commencement of the work to avoid the further spread of the plant.

[2] The list of WoNS is part of a combined State and Commonwealth initiative to combat invasive species.

Figure 6. Indicative location of Blackberry recorded within the subject site

5.2.2. Fauna

Three native mammal and nine native birds were recorded within, or in the vicinity of, the areas investigated, these being:

- Common Brushtail Possum (*Trichosurus vulpecula*) – scratches indicative of this species were observed on one of the smooth barked trees present
- Swamp Wallaby (*Wallabia bicolor*) - scats indicative of this species observed
- Common Wombat (*Vombatus ursinus*) - characteristic burrow identified beyond the limits of the works
- Black-faced Cuckoo-shrike (*Coracina novaehollandiae*) - observed
- Australian Magpie (*Cracticus tibicen*) - observed
- Pied Currawong (*Strepera graculina*) - heard calling
- Laughing Kookaburra (*Dacelo novaeguineae*) - heard calling
- Crimson Rosella (*Platycercus elegans*) - heard calling
- Superb Fairy-wren (*Malurus cyaneus*) - heard calling
- Grey Shrike-thrush (*Colluricincla harmonica*) - heard calling
- Wattlebird (*Anthochaera sp.*) - heard calling
- Spotted Pardalote (*Pardalotus punctatus*) - heard calling.

None of the species recorded are listed, or currently being considered for listing, on the Schedules to the EPBC or BC Acts. Similarly, none are considered to be reliant on any portion of the subject site for their life-cycle requirements.

The native species recorded within the study area are all protected, as defined by the BC Act, but considered to be common to abundant throughout the surrounding region. Within the surrounding region, these species have been recorded in association with a range of woodland and forest habitats, as well as disturbed environments. These species would not be solely reliant upon those habitats present within the subject site such that the removal or further disturbance of these would threaten the occurrence of these animals. The species recorded are all expected to be present within both the subject site and surrounding locality post-development.

As no threatened animals are considered to be adversely impacted by the proposal, the conducting of assessments referring to the EPBC Act's Significant Impact Guidelines and Section 7.3 of the BC Act is not required.

5.3. HBT inspection area

By the completion of this part of the study one potential HBT had been identified within the construction boundary (Figure 7). For reference, the GPS coordinate of this tree is Easting 244179, Northing 6292944[3].

When viewed from the ground, this plant appears to support hollow-bearing branches, though it is acknowledged that the orientation of these (i.e. vertical) prevented confirmation of this.

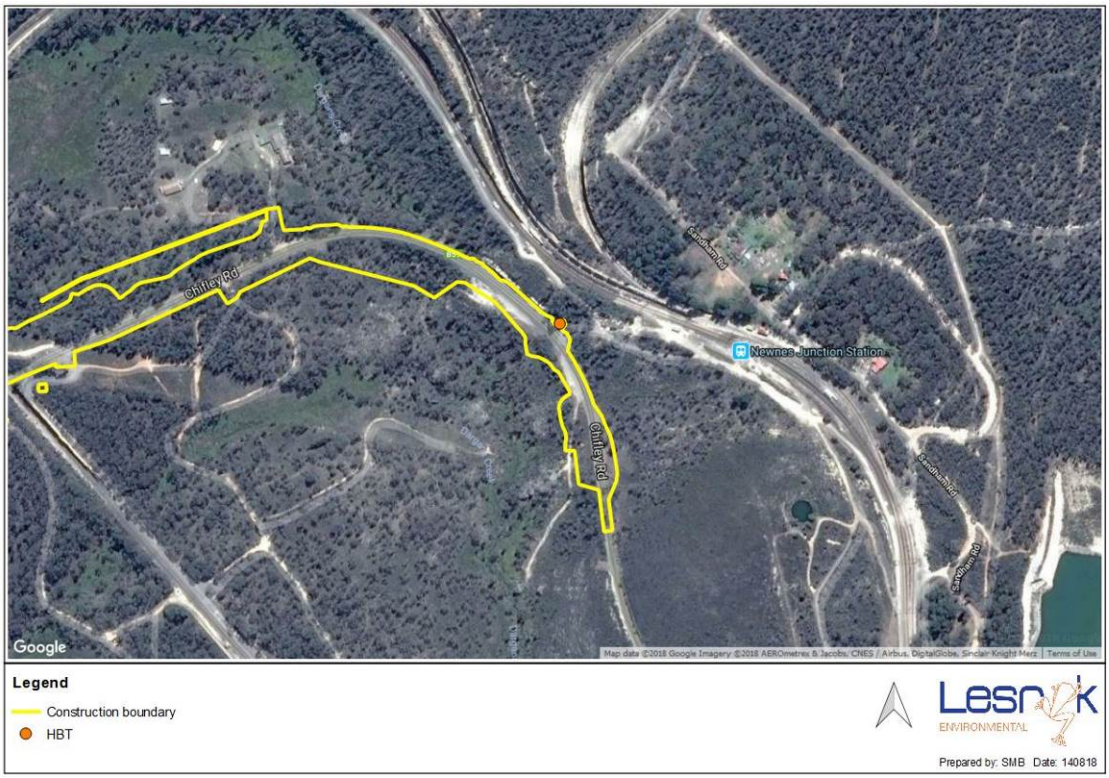

Figure 7. Indicative location of HBT recorded within the inspection area

Based on a precautionary approach, if hollow-bearing, there is the potential for this plant to be utilised by those threatened hollow-dependent microchiropterans that have previously been recorded within the study region, these being the:

- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) - listed as vulnerable under the BC Act
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) - vulnerable, BC Act.

Given the uncertainty over the structure of the potential hollow-bearing tree, combined with their previous recording in the surrounding region, it is considered necessary to adopt the precautionary principle in regards to the potential presence of these hollow-dependent microchiropterans.

[3] WGS84+/-5m

While design options are being explored to retain this HBT, the worst case scenario is the plant is removed (this being assumed by the authors at this stage). Therefore, while no significant threats to the presence of the Yellow-bellied Sheathtail-bat or Eastern False Pipistrelle in this locality are considered to arise, to further consider the impacts of the proposal on these species, an assessment drawing on the criteria provided under Section 7.3 of the BC Act has been undertaken (Attachment 3).

6. Legislative considerations

By the completion of the field surveys no ecological communities or flora or fauna species listed under the EPBC or BC Acts had been recorded within the subject site.

The clearing and disturbance of the proposed site compound and Rail Access 1 area is not expected to have an adverse impact on any ecological communities or species of Federal and/or State conservation significance. Similarly, no significant areas of habitat important for any of threatened ecological communities or species are expected to be affected.

In regard to the HBT inspection area, while design options are being explored to retain the HBT present, it has been assumed that, based on a worst case scenario, this plant will be removed. Therefore, while no threats to the presence of the potentially occurring Yellow-bellied Sheathtail-bat or Eastern False Pipistrelle are considered to arise, to further consider the impacts of the proposal on these species, an assessment drawing on the criteria provided under Section 7.3 of the BC Act has been undertaken (Attachment 3).

The assessment concluded that the proposal would not have a significant effect on either the Yellow-bellied Sheathtail-bat or Eastern False Pipistrelle, their populations or habitats.

No assessments of significance using the criteria provided under the EPBC Act's Significant Impact Guidelines have been undertaken.

Referral of the proposal to the Federal Minister for the Environment for approval or the preparation of a SIS/BDAR is not required.

7. Offset requirements

With reference to RMS' Guideline for Biodiversity Offsets publication (RMS 2011), an assessment of whether offsetting applies to the upgrading of the section of Chifley Road addressed in this study and the RPS report has been considered. Table 1 of the RMS document provides guidance on when Biodiversity offsets should be considered.

Arcadis have prepared the project's Environmental Management Report (Arcadis 2018). Included within that report was a consideration of the detailed design of the project and a calculation of the clearing areas of each vegetation community present (this being tabulated in Table 4 of their document). For reference, Table 4 has been reproduced as Figure 8.

A total of approximately 4.32 ha of vegetation clearance spread across several different vegetation communities is expected as part of the project. It is noted that this number is erroneous, the accumulated total equalling 4.31 ha.

It is noted that the 4.31 ha does not include the vegetation removal required as part of the REF Addendum for which this ecological investigation pertains to. The clearing associated with the site compound and Rail Access 1 area is expected to result in the removal of:

- 0.004 ha of Newnes Plateau Narrow-leaved Peppermint - Silver-top Ash Layered Open Forest (26 as per Figure 8), and
- 0.15 ha of Newnes Plateau Gum Hollows varient: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest (26a).

Therefore, the native vegetation expected to be disturbed within the area considered in this report totals 0.154 ha.
When added to Arcadis' estimates, a cumulative total of 4.464 ha of native vegetation is expected to be removed as part of the detailed design, site compound and Rail Access 1 area works. Table 1 provides a cumulative total of the clearing areas of each vegetation community expected to be removed.

Table 4 Comparison of vegetation clearing under the Project REF and detailed design

Vegetation community	Clearing approved in Project REF (ha)	Clearing required under detailed design (ha)	Difference (ha)
26 Newnes Plateau Narrow-leaved Peppermint – Silver-top Ash Layered	2.57	2.37	-0.20
26a Newnes Plateau Narrow-leaved Peppermint – Silvertop Ash Layered	1.83	1.73	-0.10
45 Newnes Plateau Tea Tree – Banksia – Mallee Heath	0.19	0.18	-0.01
46 Newnes Plateau Dwarf Sheoak – Banksia Heath	0.01	0.00	-0.01
50 Newnes Plateau Shrub Swamp	0.03	0.03	0.00
Total	**4.63**	**4.32**	**-0.31**

Figure 8. Excerpt from Arcadis (2018)

Table 1. Vegetation clearing required as part of the proposed road upgrade

Vegetation Community	Clearing required under detailed design	Clearing required as part of Addendum REF	Total
26 Newnes Plateau Narrow-leaved Peppermint – Silver-top Ash Layered Open Forest	2.37	0.004	**2.374**
26a Newnes Plateau Gum Hollows variant: Brittle Gum – Mountain Gum, Scribbly Gum – Snow Gum Shrubby Open Forest	1.73	0.15	**1.88**
Newnes Plateau Tea Tree - Banksia - Mallee Heath	0.18	0.00	**0.18**
Newnes Plateau Dwarf Sheoak - Banksia Heath	0.00	0.00	**0.00**
Newnes Plateau Shrub Swamp	0.03	0.00	**0.03**
Total	**4.31**	**0.154**	**4.464**

With reference to Table 1 and the RMS Guideline for Biodiversity Offsets publication no offsets are considered to be required. Table 2 provides a justification as to why no offsets are required referencing the criteria provided within RMS (2011).

Table 2. When should Biodiversity Offsets be considered?

Description of Activity or Impact	Consider Offsets?	Application to the proposal?
1. Activities in accordance with Roads and Maritime Services *Environmental assessment procedure: Routine and Minor Works* (RMS 2011).	No	Works are to be undertaken in accordance with Roads and Maritime Services *Environmental assessment procedure: Routine and Minor Works* (RMS 2011).
2. Works on cleared land, plantations, exotic vegetation where there are no threatened species or habitat present.	No	A large portion of the works will be undertaken on cleared land (i.e. road, areas devoid of vegetation), these areas not providing any habitat for threatened species.
3. Works involving clearing of native vegetation with no potential habitat for threatened species but not involving native vegetation outlined in **5**.	No	The works will involve clearing areas of native vegetation that is not suitable for threatened species and does not conform to point 5.
4. Works involving clearing of native vegetation containing potential habitat for threatened species but not involving native vegetation outlined in **5**.	Where clearing area **> 5 ha.**	The works will involve clearing areas of native vegetation that contain threatened species habitat and does not conform to point 5. Whilst this is the case, given that the cumulative total of vegetation clearing is less than 5 ha (i.e. 4.464 ha), no offsets are required.
5. Works involving clearing of native vegetation of **high** conservation value including: • A vegetation type more than 70% cleared in NSW[1] or • Threatened Ecological Communities in moderate to good condition. • Contains threatened species or their habitat that cannot withstand any loss in the Catchment Management Authority region as defined in OEH Threatened Species Profile database.	Where clearing area **>1 ha.**	The works will involve the clearing of 0.03 ha of a Threatened Ecological Community in moderate to good condition, this being Newnes Plateau Shrub Swamp. However, given that this clearing does not exceed 1 ha, no offsets are required. The works will not involve the clearing of native vegetation that: • is a vegetation type that is more than 70% cleared in NSW, or • contains threatened species or their habitat that cannot withstand any loss in the Catchment Management Authority region as defined in OEH Threatened Species Profile database. As such, no offsets are required.
6. Works involve clearing of native vegetation or threatened species and/or threatened species habitat of **very high** conservation value including: • A vegetation type that is more than 90% cleared in NSW[1] where the patch size of the impacted vegetation is greater than 4 ha[2] or, • Areas where any removal would likely result in local extinctions of communities or species[3]. • Type 1 or Type 2 sensitive key fish habitat (as identified by NSW Fisheries) where the impact cannot be otherwise mitigated.	Where there is any clearing.	The works will not involve the clearing of native vegetation or threatened species and/or threatened species habitat that: • is a vegetation type that is more than 90% cleared in NSW[1] where the patch size of the impacted vegetation is greater than 4 ha[2], or • is an area where any removal would likely result in local extinctions of communities or species[3], or • Type 1 or Type 2 sensitive key fish habitat (as identified by NSW Fisheries) where the impact cannot be otherwise mitigated. As such, no offsets are required.

Description of Activity or Impact	Consider Offsets?	Application to the proposal?
7. Works other than clearing that would lead to an impact on the long term survival of the species in the region and there is no reasonable or feasible measure available to mitigate the impact. For example creating a barrier to the movement of threatened species.	Yes	The proposed works are not expected to create any barriers to the movement of threatened species, beyond the current situation. Nor are any other impacts considered likely that would lead to an impact on the long term survival of a species in the region. As such, no offsets are required.

[1] This data is available in OEH databases.
[1] 4 ha is based on minimum size for viability of a vegetation community. This may vary for different vegetation types according to ecological advice.
[3] This would be based on advice provided by an ecologist or available in a recovery plan or priority action statement.

8. Conclusion

By the completion of the field investigation, no ecological communities, flora or fauna species listed under the EPBC or BC Acts had been recorded. Whilst a small portion of the habitat to be disturbed supports suitable habitat for *Acacia meiantha*, whilst targeted, no individuals were identified. No other threatened species known to occur within the study region are considered to rely on the subject site for any of their life cycle requirements.

In regard to the HBT inspection area, while design options are being explored to retain the HBT present, it has been assumed that, based on a worst case scenario, this plant will be removed. Therefore, it was considered necessary to adopt the precautionary approach and assume the presence of those threatened hollow-dependent microchiropterans that have previously been recorded within the study region, these being:

- Yellow-bellied Sheathtail-bat - vulnerable, BC Act
- Eastern False Pipistrelle - vulnerable, BC Act.

An assessment drawing on the criteria provided under Section 7.3 of the BC Act concluded that the proposal will not have a significant impact on either of these species.

The proposal can therefore proceed without the preparation of a SIS or BDAR. Similarly, referral of the proposal to the Federal Minister for the Environment for approval is not required.

With reference to the RMS Guideline for Biodiversity Offsets prepared by RMS (2011), given the scale of works proposed, the outcomes of the Biodiversity Assessment Report (RPS 2016) and the current ecological investigation, offsetting as part of the project is not required.

The adoption of those mitigation measures provided would ensure that the proposal is undertaken in an ecologically sustainable manner.

9. Recommendations

Based on the principles of Ecologically Sustainable Development, as identified in Schedule 2 of the Environmental Planning and Assessment Regulation, the following recommendations are provided:

- Clearing of native vegetation/plants should be limited to the minimum required to achieve the objectives of the project. This pertains particularly to those mature trees present.

- Limits of clearing should be provided to the construction contractor and identified both on site maps/plans and on site through the erection of temporary fencing, bunting or similar. Fencing etc should be established at the outer limits of the drip line of those plants being retained.

- If the potentially HBT present within the eastern limits of the project area is retained:

    - its location should be clearly marked on a plan and provided to the work contractor

    - temporary fencing/bunting should be established at the outer limits of this plant's drip line and no vehicles or machinery should be stored or parked within this area.

    - A no-go sign should also be established on the temporary fencing/bunting.

- Should the HBT require removal, if possible, it should be checked beforehand by use of an unmanned aerial vehicle (drone), ladder or elevated work platform/'cherry picker'. Should the hollow(s) appear favourable to the occupation by native animals, then the following mitigation measures should be adopted:

    - The tree should be checked for sheltering animals by a suitably qualified ecologist (or similar) prior to, and after, its felling with any collected individuals being relocated locally.

    - A qualified ecologist or wildlife carer should be present on-site during the felling of the hollow-bearing tree.

    - The ecologist/wildlife carer should provide advice on the most suitable way to fell the hollow-bearing tree.
        - i.e. clear all non-hollow bearing and other vegetation around the plant 24 hours before its felling
        - establish effective lines of communication between ecologist and excavator operator
        - tree to be knocked three to four times by excavator bucket before its felling
        - supervising ecologist to observe tree to see if any species are disturbed by knocking and present at hollow entrance
        - tree knocked again if necessary
        - tree felled
        - ecologist to inspect hollow and collect/relocate any sheltering species
        - exotic species to be taken to local veterinarian for euthanasing.

    - Any native animals injured during the clearing works should be collected and taken to a local veterinarian or wildlife carer.
        - Veterinarian hospitals are present at Lithgow [0263513269] and Katoomba [0247823273]

- Vehicles and machinery should not be stored or parked in those areas of vegetation that have been fenced or occur beyond the limits of the construction boundary.

- Where possible, any felled sections containing hollows should not be mulched but should be relocated locally within either the study area or adjacent retained bushland areas to provide habitat for native species and their prey (as per RMS 2011).

- In accordance with the NSW *Biosecurity Act 2015*, Blackberry must be controlled to result in its suppression.

- A site specific Erosion and Sediment Control Plan will be prepared and implemented for the project.

- Sedimentation fencing/bunding should be established along the northern perimeter of the compound site to safeguard against potential impacts to the adjacent Newnes Plateau Shrub Swamp endangered ecological community (listed under the EPBC and BC Acts).

- If the above recommendation is not adopted a reconsideration of the potential impact on the Newnes Plateau Shrub Swamp endangered ecological community must be undertaken.

- Newly exposed surfaces should be stabilised as soon as possible in order to reduce the potential for soil erosion. This should be done through the planting of native species endemic to the study area or non-invasive grass species.

If you require any further information on this matter, please do not hesitate to contact the undersigned on either (02) 9523 2016 or 0404 803 409.

Yours sincerely,

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Lesryk Environmental Pty Ltd

Reviewed by Mr Deryk Engel [Director, Lesryk Environmental Pty Ltd, 28/08/18]

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Attachment 1. Photographic record of the subject site

Plate 1. The character of the area to be disturbed at the Rail Access 1 area.

Plate 2. The cleared character of the proposed compound site.

Plate 3. The character of the regrowth area within the proposed compound site.

Plate 4. The cleared character of the proposed compound site and the linear stand of trees to be removed along the southern boundary (background).

Attachment 2. Flora species recorded within the subject site

* - introduced species
[s] – weed of significance

FAMILY	Scientific Name	Common Name
FILICOPSIDA		
Dennstaedtiaceae	*Pteridium esculentum*	Bracken Fern
PINOPSIDA		
Pinaceae	*Pinus radiata* *	Radiata Pine
MAGNOLIOPSIDA - DICOTYLEDONS		
Asteraceae	*Cassinia sp.*	
	Cirsium vulgare *	Scotch Thistle
	Conyza bonariensis *	Fleabane
	Hypochaeris radicata *	Catsear
Epacridaceae	*Epacris pulchella*	Wallum Heath
	Leucopogon ericoides	Pink Beard-heath
	Leucopogon lanceolatus	Lance-leaf Beard-heath
Euphorbiaceae	*Amperea xiphoclada*	Broom Spurge
Fabaceae: Faboideae	*Bossiaea heterophylla*	Variable Bossiaea
	Daviesia latifolia	Hop Bitter-pea
Fabaceae: Mimosoideae	*Acacia longiflora* var. *longifolia*	Sydney Golden Wattle
	Acacia terminalis	Sunshine Wattle
	Acacia ulicifolia	Prickly Moses
Geraniaceae	*Geranium sp.*	
Goodeniaceae	*Dampiera stricta*	Blue Dampiera
	Goodenia bellidifolia subsp. *bellidifolia?*	
Haloragaceae	*Gonocarpus sp.*	
Myrtaceae	*Eucalyptus dives*	Broad-leaved Peppermint
	Eucalyptus mannifera	Brittle Gum
	Eucalyptus oreades?	Blue Mountains Ash
	Eucalyptus radiata	Narrow-leaved Peppermint
	Eucalyptus sieberi	Silvertop Ash
	Leptospermum sp.	Grey Tea-tree
	Leptospermum trinervium	Paperbark Tea-tree
Pittosporaceae	*Billardiera scandens*	Apple Berry
Plantaginaceae	*Plantago lanceolata* *	Lamb's Tongue
Proteaceae	*Grevillea acanthifolia*	
	Grevillea laurifolia	Laurel-leaf Grevillea
	Lomatia silaifolia	Crinkle Bush
	Persoonia levis	Broad-leaf Geebung
	Persoonia sp.	
	Petrophile pulchella	Common Conesticks
Rosaceae	*Rubus fruticosus* agg. spp. * [s]	Blackberry
Rutaceae	*Boronia microphylla*	Small Leaved Boronia
Thymelaeaceae	*Pimelea linifolia* subsp. *linifolia*	Rice Flower
Verbenaceae	*Verbena bonariensis* *	Purpletop
MAGNOLIOPSIDA - MONOCOTYLEDONS		
Cyperaceae	*Gahnia sp.*	
Iridaceae	*Patersonia sp.*	Purple Flag
Juncaceae	*Juncus sp.*	Rush
Lomandraceae	*Lomandra longifolia*	Mat Rush
	Lomandra sp.	
Phormiaceae	*Dianella sp.*	Flax Lily
Poaceae	*Aristida ramosa*	Purple Wiregrass

FAMILY	Scientific Name	Common Name
	Austrostipa sp.	
	Cortaderia selloana *	Pampas Grass
	Echinopogon caespitosus	Common Hedgehog Grass
	Entolasia stricta	Wiry Panic
	Eragrostis curvula *	African Love Grass
	Microlaena stipoides	Weeping Grass
	Panicum sp.	
	Poa sieberiana var. *sieberiana*	Snowgrass
	Rytidosperma sp.	A Wallaby Grass
	Setaria sp. *	Pigeon Grass
	Stenotaphrum secundatum *	Buffalo Grass

Attachment 3. Ecological assessments

1. State – *Environmental Planning and Assessment Act 1979*

With reference to the assessment criteria provided under Section 7.3 of the BC Act, the potential impacts associated with the proposed work on the following potentially occurring threatened microchiropterans have been considered:

- Yellow-bellied Sheathtail-bat - vulnerable
- Eastern False Pipistrelle - vulnerable

These criteria consider factors that trigger the likelihood of a development to have a significant effect on threatened species or their habitats, and consequently whether the preparation of a SIS/BDAR is required.

In line with the guidelines provided by OEH (then DECC) on the Assessment of Significance (DECC 2007), due to the similarity of their habitat requirements, assessments have been undertaken on 'hollow-dependant microchiropterans' as a group as opposed to assessments being carried out on individual species.

1. (a) Five-part test - Hollow-dependent Microchiropterans

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The Yellow-bellied Sheathtail-bat and Eastern False Pipistrelle have been previously detected within the study region.

The proposal will require the removal of around 4.31 ha of native vegetation, this including the clearing of one hollow-bearing trees and a number of insect attracting plants. While this is the case, comparable stands of woodland that support similar resources are present both within, and adjacent to, the subject site, including within the nearby Blue Mountains and Wollemi National Parks. Given the extent of suitable habitat being retained within both the study area and that present within the surrounding region, the loss of one hollow-bearing tree and an area of insect attracting plants is not considered to have an adverse effect on the life cycle of these species such that viable local populations of these animals would be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable to threatened species.

(c) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity,

The proposal will require the removal of a maximum of 4.31 ha of native vegetation, this including insect attracting plants and one hollow-bearing tree; however, similar habitat will be retained in the surrounding area.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity,

Hollow-dependent microchiropterans can easily negotiate open areas and have been recorded flying over open spaces (author's field notes); as such, the loss of some native vegetation, this including insect attracting plants and one hollow-bearing tree, is not expected to result in the disturbance to the Yellow-bellied Sheathtail-bat and Eastern False Pipistrelle's dispersal or movement patterns; these species being able to easily negotiate/traverse the subject site post disturbance. Suitable habitat for these species would be retained within the study area and surrounding locality; as such, the proposal would not cause any further fragmentation of, or isolation to, any areas of habitat used by hollow-dependent microchiropterans.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species, population or ecological community in the locality,

The proposal is not considered to remove, modify, fragment or isolate a significant amount of vegetation such that the long-term survival of the Yellow-bellied Sheathtail-bat or Eastern False Pipistrelle would be jeopardised. The habitats within the study area extend well beyond the limits of the proposal. Given that no major components of these species' habitat are to be further isolated or fragmented, it is not considered that the proposal would have an impact on the Yellow-bellied Sheathtail-bat or Eastern False Pipistrelle such that the long-term survival of these species in the locality would be adversely affected.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The subject site is not listed as a declared AOBV under Part 3 of the BC Regulation 2017. No declared AOBV would be directly or indirectly affected by the proposal.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

Currently 35 KTP for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the 'clearing of native vegetation' and 'loss of hollow-bearing trees' would be applicable to the proposal. While it is acknowledged that the proposed work will result in the removal of some native vegetation, this including insect attracting plants and one hollow-bearing trees, it is not considered that this clearance would significantly contribute to either of the applicable KTP such that the life cycle requirements of the Yellow-bellied Sheathtail-bat and/or Eastern False Pipistrelle would be compromised.

Expected impact on hollow-dependent microchiropterans

The undertaking of the proposal would not disturb, remove, modify or fragment any habitats critical to the life cycle requirements of the Yellow-bellied Sheathtail-bat or Eastern False Pipistrelle. Given the extent of suitable habitat being retained within both the study area and surrounding bushland, the removal of some vegetation, this including insect attracting plants and one hollow-bearing tree, is not considered to have a significant impact on the Yellow-bellied Sheathtail-bat or Eastern False Pipistrelle or their habitat. As such, the preparation of a SIS/BDAR that further considers the impact of the proposed road work on hollow-dependent microchiropterans is not required.

Appendix E

Addendum Statement of Heritage Impact

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Cosmos Archaeology Pty Ltd

Bells Line of Road Corridor
Chifley Road Upgrade

Non – Aboriginal Heritage Assessment
and
Statement of Heritage Impact

ADDENDUM
to
Recommendation for CRC03

Short Letter Report

August 2018

Lithgow,
NEW SOUTH WALES

INTRODUCTION

In April 2016 Cosmos Archaeology prepared a Statement of Heritage Impact on Bells Line of Road Corridor – Chifley Road upgrade as part of a Review of Environmental Factors being carried out for NSW Roads and Maritime Services.[1] The study area included Chifley Road on either side of the Clarence road over rail bridge.

The report a number of recommendations to mitigate the impact of the proposed works on the identified Non-Aboriginal Heritage.

One site identified was the remains of the formation (linear embankment) associated with the 1869 alignment of the Western Railway Line. This site was labelled as CRC03 located at and assessed to be of Local significance.

The proposed road alignment passes over the site and at the time of the writing of the report the eastern end of the formation was to be buried. To mitigate the impact of the proposed works it was recommended that :

> *Recommendation 1: Prohibit vehicle entry during the construction phase*
>
> *This will require the delineation through survey of that part of the foundation not to be directly impacted by the works and it being noted as a heritage item on construction plans. It would also include setting a visible curtilage around the feature during the construction phase.*
>
> *Recommendation 2: Avoid or minimise damage during construction phase*
>
> *The ballast of the foundation should not be used for any aspect of the implementation of the proposal.*
>
> *Recommendation 3: Limit the impact to this feature*
>
> *The development of the detailed design for the drainage design should not further impact this feature where reasonable and feasible.*[2]

Cosmos Archaeology has been commissioned by Hills Environmental to re-assess the impact of the proposed works on this site as the 100% detailed design requires the eastern portion of the foundation to be removed. (Figure 1).[3]

DESCRIPTION AND SIGNIFICANCE OF CRC03

The formation of CRC 03 is located on the northern side of the existing road.

Site	Chainage	Easting	Southing
CRC 03	5815 to 5900	243842 to 243928	6293052 to 6293048

This feature is a linear embankment or formation, the upper part seemingly composed of sandstone chips/gravel and possibly some course grained basalt up to 15 mm across. It is up to 3 m wide and flat at the top and is up to 2 m high. Numerous trees are growing on the top of the feature.

The remnant formation which is approximately 70 m in length runs on an approximate east-west axis. It intersects, and has been cut by, Chifley Road where the causeway over Dargan Creek valley starts at its western end

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[1] **Cosmos Archaeology Pty Ltd April 2016** *Bells Line of Road Corridor – Chifley Road Upgrade: Non-Aboriginal Heritage Assessment and Statement of Heritage Impact*. Prepared for NSW Roads and Maritime Services
[2] *Op. Cit.*, **Cosmos Archaeology Pty Ltd April 2016** : 47
[3] Hill, Stuart Hills Environmental : Email 8th August 2018 5:40 pm

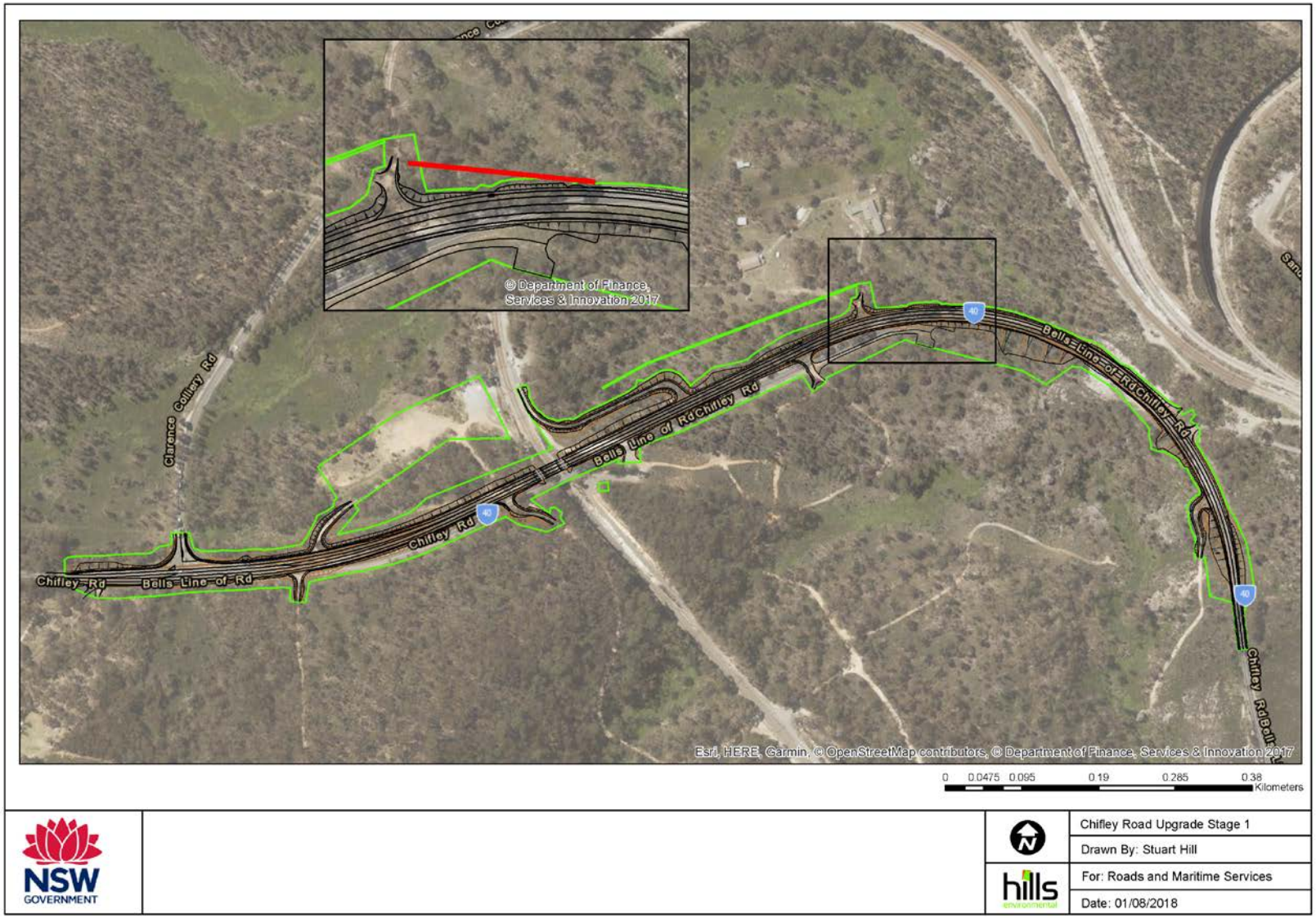

Figure 1 – Current construction boundary and 100% detailed design. Extent of CRC03, railway formation, in red.

(Chainage 5810) (Figure 2). The western end of the formation has been cut by the access track connecting private property (Lot 2 DP 606571) to Chifley Road (Figure 3).

Figure 2: Eastern end of formation CRC 03 where it is cut by the present day Chifley Road. (Source: Cosmos Archaeology)

Figure 3: Western end of formation CRC 03 where it is cut by track leading from Chifley Road to a private property. (Source: Cosmos Archaeology)

The embankment is a remnant of the formation for the original alignment of the Western railway line to Bowenfels/Lithgow, which was constructed in 1869 (Figure 4). This section of the line was abandoned in 1897 with the opening of the Dargan Creek Deviation.

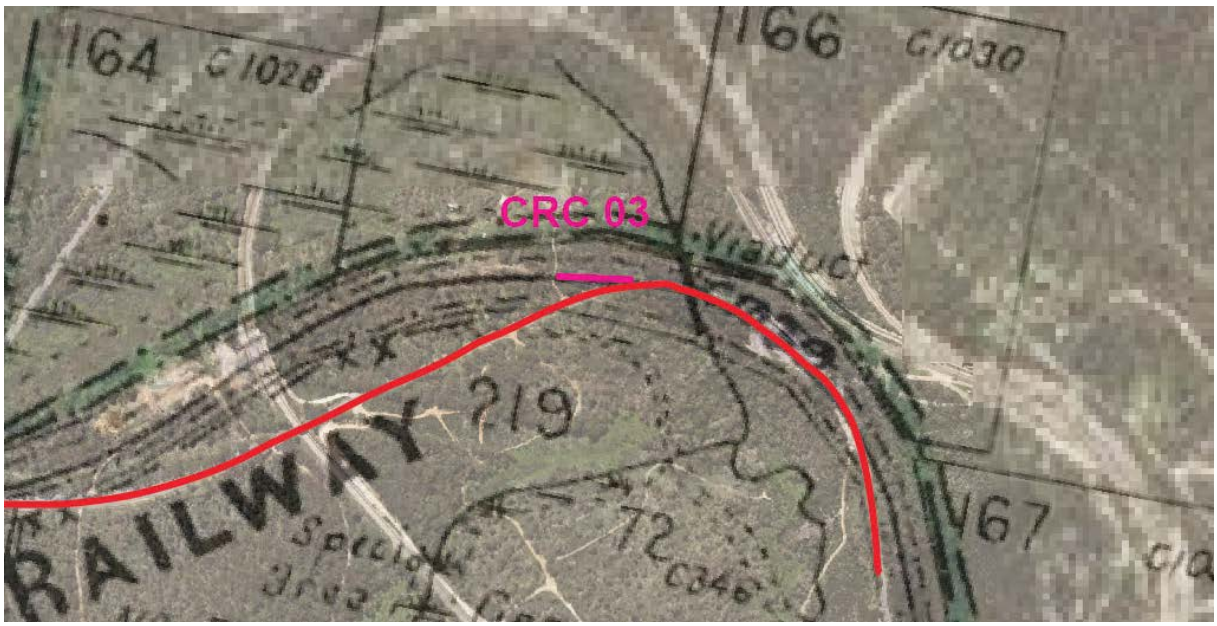

Figure 4: Relationship of the embankment/formation with the original alignment of the 1869 Western railway line as shown in 1890 Parish Plan, with the current alignment of Chifley Road – shown as red line. (Source: Cosmos Archaeology)

Significance assessment

Criterion	Assessment	Grade
*An item is important in the **course or pattern** of NSW's **cultural or natural history** (or the cultural or natural history of the local area)*	The formation is associated with the original construction of the Western railway line. When the line was opened in 1869 it triggered extensive development and had a profound influence on the economy of western New South Wales. It contributed to the economy of western New South Wales to such an extent that the section of line where the formation is situated could not handle the volume of traffic and had to be replaced.	**Local**
*An item has strong or special **associations with** the life or works of **a person, or group of persons, of importance in NSW' cultural or natural history** (or the cultural or natural history of the local area)*	The formation does not appear to have any strong or special connection with a person or group of persons of importance in NSW history.	Does not meet this criterion
*An item is important in demonstrating **aesthetic characteristics** and / or a high degree of **creative or technical achievement** In NSW (or the local area)*	The formation is composed of ballast and displays no readily identifiable technical or creative achievement. It is covered in trees and brush with no redeemable aesthetic qualities.	Does not meet this criterion
*An item has strong or special **associations with a particular community or cultural group** in NSW (or the local area) for **social, cultural or spiritual reasons***	The formation does not appear to have any strong or special associations with a particular community or cultural group in NSW history.	Does not meet this criterion
*An item has **potential to yield information** that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)*	The composition of the formation has the potential to provide limited and localised information on the sourcing and application of ballast used on the building of the Western railway line.	**Local**
*An item possesses **uncommon, rare or endangered** aspects of NSW's cultural or natural history (or the cultural or natural history of the local area)*	The formation is part of the infrastructure constructed for the Western railway line and railway lines in general throughout the 1860s.	Does not meet this criterion
*An item is important in **demonstrating** the **principal characteristics of a class of NSW's cultural or natural** places; or cultural and natural environments*	The formation is an example of its type, that is, railway infrastructure from the 1860s.	Does not meet this criterion

Statement of cultural significance

The formation is of local significance through its association with the 1869 alignment of the Western railway line and to a limited extent to its ability to provide information on how this type of railway infrastructure was formed at this point along the railway line.

REVISED IMPACT ASSESSMENT

The work to be carried out in the vicinity of this site will remove the eastern end of the formation and expose the remainder through the removal of trees.

- *What aspects of the proposal respect or enhance the heritage significance of the item?*

The work will leave the majority of the formation more visible, and more amenable to interpretation, with the removal of trees and other vegetation.

- *What aspects of the proposal could have a detrimental effect on the heritage significance of the item?*

The work will remove possibly up to 15 m of the eastern end of the formation this will have minor impact on the significance of the item. This impact can be mitigated by:

- Record the exposed cross section of the formation after the eastern portion has been removed. The objective of the recording is document how the formation was constructed and what materials were used.

During the construction phase of the road upgrade, the formation may be damaged by machinery, or even quarried for fill. This impact can be mitigated by:

- Setting a visible curtilage around the formation during the construction phase for the purposes of prohibiting entry for vehicles
- The ballast that comprises the remainder of the foundation should not be used for any aspect of the implementation of the works.

− *_Have more sympathetic options been considered and discounted? Why?*

No alternate design options have been considered with respect to this item during the course of this assessment.

REVISED MITIGATION MEASURES

Recommendation 1: Record exposed cross section of the formation after eastern portion removed.

An archaeologist is to record the exposed face or section of the formation after the eastern portion is to be removed and the area has been cleared of vegetation. Recording will include measured drawings and photography.

The objective of the recording is document how the formation was constructed and what materials were used.

Recommendation 2: Prohibit vehicle entry during the construction phase

This will require the delineation through survey of that part of the foundation not to be directly impacted by the works and it being noted as a heritage item on construction plans. It would also include setting a visible curtilage around the feature during the construction phase.

Recommendation 3: Avoid or minimise damage during construction phase

The ballast that comprises the remainder of the foundation should not be used for any aspect of the implementation of the works

Recommendation 4: Limit the impact to this feature

The development of the detailed design for the drainage design should not further impact this feature where reasonable and feasible.

Appendix F

Stage 1 Aboriginal cultural heritage clearance

Transport
Roads & Maritime
Services

3/8/2018

Sivapatham Aruneswaran
Project Manager
Greater Sydney Project Office

Dear Sivapatham

Re: Preliminary assessment results for the Clarence Bridge Replacement, Rail Access 1, construction boundary extension proposal, based on Stage 1 of the *Procedure for Aboriginal cultural heritage consultation and investigation* (the procedure).

The project, as described in the Stage 1 assessment checklist, was assessed as being unlikely to have an impact on Aboriginal cultural heritage. The assessment is based on the following due diligence considerations:

- The project is unlikely to harm known Aboriginal objects or places.
- The AHIMS search did not indicate any known Aboriginal objects or places in the immediate study area.
- The study area does not contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Roads and Maritime Services' procedure.
- The Aboriginal cultural heritage potential of the study area appears to be severely reduced due to past disturbance.

Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.
Please Note: If the scope of your project changes, you must contact me and your regional environmental staff to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the course of the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Roads and Maritime Services' *Unexpected Heritage Items Procedure*.

For further assistance in this matter do not hesitate to contact me.

Yours sincerely

M. Lester

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