M1 Pacific Motorway Extension to Raymond Terrace

Critical State Significant Infrastructure Assessment

SSI 7319

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Cover image: Artist impression of the Tarro interchange (TfNSW)

Glossary

Abbreviation	Definition
AEP	Annual exceedance probability - the probability that a flood of a given (or larger) magnitude will occur within a period of one year. For example, a 1% AEP flood event means there is a 1-in-100 chance that a flood of that size (or larger) could occur in any one year.
AOPCR	Areas of Potential Contamination Risk
ASS	Acid sulfate soils
BAR	Biodiversity Assessment Report
BC Act	*Biodiversity Conservation Act 2016*
Council	City of Newcastle, Port Stephens Council, and Maitland City Council
CSSI	Critical State Significant Infrastructure
dB(A)	Decibel
DCCEEW	Department of Climate Change, Energy, the Environment and Water (formerly Department of Agriculture, Water and the Environment)
Department	Department of Planning and Environment
DPI Fisheries	Department of Primary Industries – Fisheries
DPE Water	Water Group of Department of Planning and Environment
EEC	Endangered ecological communities
EHG (BCD)	Biodiversity and Conservation Division of the Environment and Heritage Group of the Department of Planning and Environment
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
ESD	Ecologically sustainable development
FBA	Framework for Biodiversity Assessment

GDEs	Groundwater dependent ecosystems
GGBF	Green and Golden Bell Frog
Heritage NSW	Heritage NSW of Environment and Heritage Group of the Department of Planning and Environment *Note: Heritage NSW incorporates both Aboriginal cultural heritage and built heritage matters effective from 1 April 2022*
Hunter LLS	Hunter Local Land Services
HPV	High productivity vehicles
HWC	Hunter Water Corporation
ICNG	Interim Construction Noise Guideline
LGA	Local government area
Minister	Minister for Planning
MNES	Matters of National Environmental Significance
NCA	Noise catchment Area
NL	Noise loggers
NLTN	National Land Transport Network
NML	Noise management levels
NRAR	Natural Resources Access Regulator, DPE
PADs	Potential archaeological deposits
PAS	Potential artefact scatters
PCTs	Plant Community Types
PBS	Performance Based Standard
QDLs	Quantitative design limits
RAP(s)	Registered Aboriginal Party(ies)
RtS	Response to Submissions Report / Submissions Report
SAQP	Sampling and analysis quality plan
SEARs	Planning Secretary's Environmental Assessment Requirements
Planning Secretary	Secretary of the Department of Planning and Environment
SEPP	State Environmental Planning Policy

TAPs	Threat abatement plans
TEC	Threatened ecological communities
TfNSW	Transport for NSW
TSC Act	*Threatened Species Conservation Act 1995*

Executive Summary

Transport for NSW (the Proponent) is seeking approval to construct and operate the M1 extension to Raymond Terrace (the project). The project comprises the construction and operation of a new divided motorway between the M1 Pacific Motorway at Black Hill to the Pacific Highway at Raymond Terrace and includes:

- approximately 15 kilometres of four-lane divided road
- four interchanges located at Black Hill, Tarro, Tomago, and Raymond Terrace
- a viaduct about 2.6 kilometres long across the Hunter River and floodplain
- bridge structures over local waterways at Tarro and Raymond Terrace, and an overpass for Masonite Road in Heatherbrae
- connections and modifications to the adjoining local road network, including upgrading and realignment of the New England Highway between John Renshaw Drive and Tarro
- realignment of the existing Pacific Highway near the Hunter Region Botanic Gardens, with a new signalised intersection connecting to a new access road to the gardens.

The project is part of the Proponent's long-term strategy to upgrade the Pacific Highway to a dual carriageway standard road between Sydney and Brisbane to reduce travel times and increase road safety. Following the completion of NorthConnex and the duplication of the Pacific Highway in 2020, the Coffs Harbour Bypass (currently under construction) and the project are the final two remaining major upgrades required to complete a free-flowing dual carriageway National Land Transport Network route along the east coast.

The project complies with the objects of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and is consistent with the NSW Government's key priorities and transport planning framework. The project is critical State significant infrastructure under section 5.13 of the EP&A Act. The Minister for Planning is the approval authority.

The Department considers the environmental impacts of construction and operation are acceptable, subject to implementation of appropriate mitigation and management measures and compliance with the Department's recommended conditions of approval. The Department considers that the project is in the public interest and should be approved, subject to conditions.

Community engagement

The Environmental Impact Statement (EIS) was publicly exhibited from 28 July to 24 August 2021 (a total of 28 days) on the Department's website. During the exhibition period, the Department received a total of 49 unique submissions on the project. Of the submissions received, one was from a State-owned corporation, three were from local councils, 10 were from special interest groups and 35 were from community members. Seventeen submissions were in support of the project, seven submissions objected to the project, and 25 submissions provided comments. No council objected to the project. Seven government agencies provided advice.

The key issues raised by the community and considered in this report include flooding and hydrology, traffic and transport, noise and vibration, social issues, land and property use, and biodiversity.

Key assessment issues

Traffic and Transport

The project would provide a new motorway corridor between the M1 at Black Hill and the Pacific Highway at Raymond Terrace and provide benefits across the traffic network. The project would reduce pinch points in the regional road network by bypassing five sets of traffic lights between the existing M1 Pacific Motorway / Weakleys Drive / John Renshaw Drive intersection at Black Hill and the intersection at Pacific Highway / Hank Street at Heatherbrae and the existing Hunter River bridge and provide increased reliability and network safety.

The project has been designed to not preclude the future development of the Lower Hunter Freight Corridor proposal, and design features have been included where the project interacts to allow for the future freight proposal.

The project has been designed in consideration of surrounding residents and the local environment, and would provide a safer local road network through the transfer of traffic onto the new motorway and off State roads used by locals to traverse the local suburbs of Beresfield, Black Hill, Tomago, Tarro, Hexham, Heatherbrae, and Raymond Terrace.

Construction traffic impacts are considered acceptable as the majority of construction traffic movements would be along the existing arterial road network. However, there will be use of local roads and traffic impacts will be higher on these. In particular Anderson Drive, Tarro (which is a residential area) and Woodbury Road and Adelaide Road which pass through the residential suburbs of Woodbury and Raymond Terrace, will be used as a haulage route for quarry materials, and plant and equipment coming from the north west. There are no alternatives to these routes and these impacts would need to be managed through proactive traffic management measures.

The delivery of the project is proposed to be undertaken in a two-stage process to provide initial traffic benefits, while the Hunter River crossing is constructed.

Noise and Vibration

The project will exceed noise management levels (NML) set out in the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) during construction. Night-time construction noise impacts are unavoidable due to constraints associated with construction activities in active road corridors which require partial or full road closures and that can only be undertaken at night to avoid significant traffic disruptions. These construction activities include interfaces with the existing M1 Pacific Motorway, New England Highway upgrade and the construction of the Tarro interchange, bridge construction work over the Main North Rail Line and existing roads, and Pacific Highway tie-in works (at Tomago, Heatherbrae and Raymond Terrace). To support these activities some construction compounds (including concrete and asphalt batching plants) would need to operate during the night. The Department has recommended conditions to manage impacts associated with out-of-hours works, including coordination of utility management works, active community engagement, provision of respite periods and implementation of at-property architectural noise treatments.

Operation of the project will result in exceedances of operational noise criteria (set out in the *Road Noise Policy* (DECCW, 2011) and *Noise Criteria Guideline* (RMS, 2015)) at 200 residences and 21 other sensitive receivers. Operational noise impacts that exceed the relevant road traffic noise criteria are predicted in areas where the new alignment is closer to residents and other sensitive receivers, and around the new interchange at Tarro.

To reduce operational traffic noise impacts, the Proponent has proposed to install new, and upgrade existing, noise barriers along the New England Highway at Tarro, install a new noise barrier at Tomago and relocate the existing noise barrier at Black Hill so that it is adjacent to residential areas. The New England Highway at Tarro will be upgraded with low noise pavement to reduce operational noise impacts to affected residents. At-property architectural noise treatments will be provided at residences and other sensitive receivers where NMLs are exceeded following the implementation of at source (low noise pavement) and barrier treatments. The Department has recommended the Proponent review the effectiveness of the proposed mitigation measures during detailed design and undertake operational noise validations within twelve months and at five years after opening.

Flooding and Hydrology

The project is located in the lower portion of the Hunter River catchment. The catchment area is comprised of a range of land uses including agricultural, industrial, commercial, residential and environmental conservation (wetlands and national parks). The Hunter River Floodplain is a sensitive catchment and any new development, structures or landforms would impact on hydrology and flooding. The proposed viaduct and bridge over the Hunter River will have an influence on existing flooding experienced within the Hunter River Floodplain catchment. The viaduct piers on the floodplain will hinder flood flows and reduce floodplain storage, and increase existing flood levels upstream of the project for all flood events up to and including the 1% annual exceedance probability by between 0.01 to 0.02 metres in (1% AEP - i.e. a flood of a size that has a 1 in 100 chance of occurring in any one year)).

The Department engaged Bewsher Consulting to undertake an independent and expert peer review of the flooding assessment (**Appendix H**).

Based on the Department's review, and advice from the independent flood expert, quantitative design limits (QDLs) aimed at minimising flood impacts have been developed. The Proponent has committed to undertake further flood modelling during detailed design to refine and verify the extent of flood impacts; and ensure that the project meets the recommended QDLs. Where QDLs cannot be met, mitigation measures will need to be implemented with the agreement of the impacted landowner.

Biodiversity

The project will have direct and indirect impacts to threatened ecological communities and threatened species listed under the *Threatened Species Conservation Act 1995* (TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). However, there is the potential for these impacts to be reduced during the detailed design of the project. The Proponent has committed to implementing a range of mitigation measures to reduce biodiversity impacts, including habitat connectivity structures (such as fauna crossings), exclusion fencing, protecting aquatic habitat during construction, managing the vegetation clearing process, revegetation on completion of construction, weed management, and directing lighting away from vegetated areas where possible.

The project has avoided impacts to biodiversity where possible. Where impacts to biodiversity values cannot be avoided, and all practicable measures have been proposed to minimise impacts, the residual impacts on biodiversity values will be offset under the *NSW Biodiversity Offsets Policy for Major Projects*, including the acquisition and retirement of ecosystem and species credits. Impacts to key fish habitat will be offset in accordance with the *Fisheries NSW Policy, particularly the Guidelines for Fish Habitat Conservation and Management 2013*.

The Department has recommended conditions of approval which specify the ecosystem and species credits required for the project, offsetting impacts to key fish habitat, measures to protect the Estuary Cod, requirements for tree replacement, and a Flora and Fauna Management Sub-plan to manage impacts on biodiversity during the construction of the project.

Social and economic

The project will provide local and regional economic benefits through improved amenity in town centres and local access due to traffic being removed from State and regional roads. It would also improve access to key employment areas such as Beresfield, Black Hill, Tomago, and Port of Newcastle for residents and workers in the region. However, it will remove through traffic from the New England Highway and Pacific Highway, resulting in less passing trade for local businesses. To address this loss, the Proponent will implement a signage plan that highlights the local centres, and departure points to these from the motorway.

As with all major road projects, there will be direct impacts on some individuals, particularly those who will be affected by land acquisition. Approximately 43 per cent of properties directly located within the construction footprint are currently owned by the Proponent, with the remaining property acquisitions to be carried out in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*, consistent with mechanisms used for other linear infrastructure projects in NSW.

Contents

1 Introduction

Transport for NSW (the Proponent) is seeking approval to construct and operate the M1 extension to Raymond Terrace (the project). The project comprises the construction and operation of a new divided motorway between the M1 Pacific Motorway at Black Hill to the Pacific Highway at Raymond Terrace. The project alignment is shown in **Figure 1** and **Figure 2** and includes:

- approximately 15 kilometres of four-lane divided road
- four interchanges located at Black Hill, Tarro, Tomago, and Raymond Terrace
- a viaduct about 2.6 kilometres long across the Hunter River and floodplain
- bridge structures over local waterways at Tarro and Raymond Terrace, and an overpass for Masonite Road in Heatherbrae
- connections and modifications to the adjoining local road network, including upgrading and realignment of the New England Highway between John Renshaw Drive and Tarro
- realignment of the existing Pacific Highway near the Hunter Region Botanic Gardens, with a new signalised intersection connecting to a new access road to the gardens.

The photomontages in **Figure 3** to **Figure 6** show some of the key elements of the project.

The project is part of the Proponent's long-term strategy to upgrade the Pacific Highway to a dual carriageway standard road between Sydney and Brisbane, to reduce travel times and increase road safety. Following the completion of NorthConnex and the duplication of the Pacific Highway in 2020, the Coffs Harbour Bypass and the project are the two remaining major upgrades required to complete a free-flowing dual carriageway National Land Transport Network (NLTN) route along the east coast.

There is currently no direct motorway connection between Black Hill and Raymond Terrace. The existing NLTN linking the M1 Pacific Motorway at Black Hill with the Pacific Highway at Raymond Terrace (i.e. John Renshaw Drive and the New England Highway) is one of the most highly-trafficked areas in the region, and more heavily congested than nearby high standard sections of the M1 Pacific Motorway and Pacific Highway corridors.

The project is located within the City of Newcastle and Port Stephens local government areas. Existing land uses along the project corridor include:

- rural and agricultural uses, including grazing, horticulture, and plantation forests
- residential and commercial uses
- industrial uses at Beresfield, Black Hill, Tomago, and Heatherbrae
- environmental uses including the Hunter Wetlands National Park, Hunter River, and Hunter Region Botanic Gardens at Heatherbrae
- land used for resource protection associated with Hunter Water Corporation assets, including the Tomago Sandbeds
- transport infrastructure including roads, New England and Pacific Highways, M1 Pacific Motorway, and Main North Rail Line.

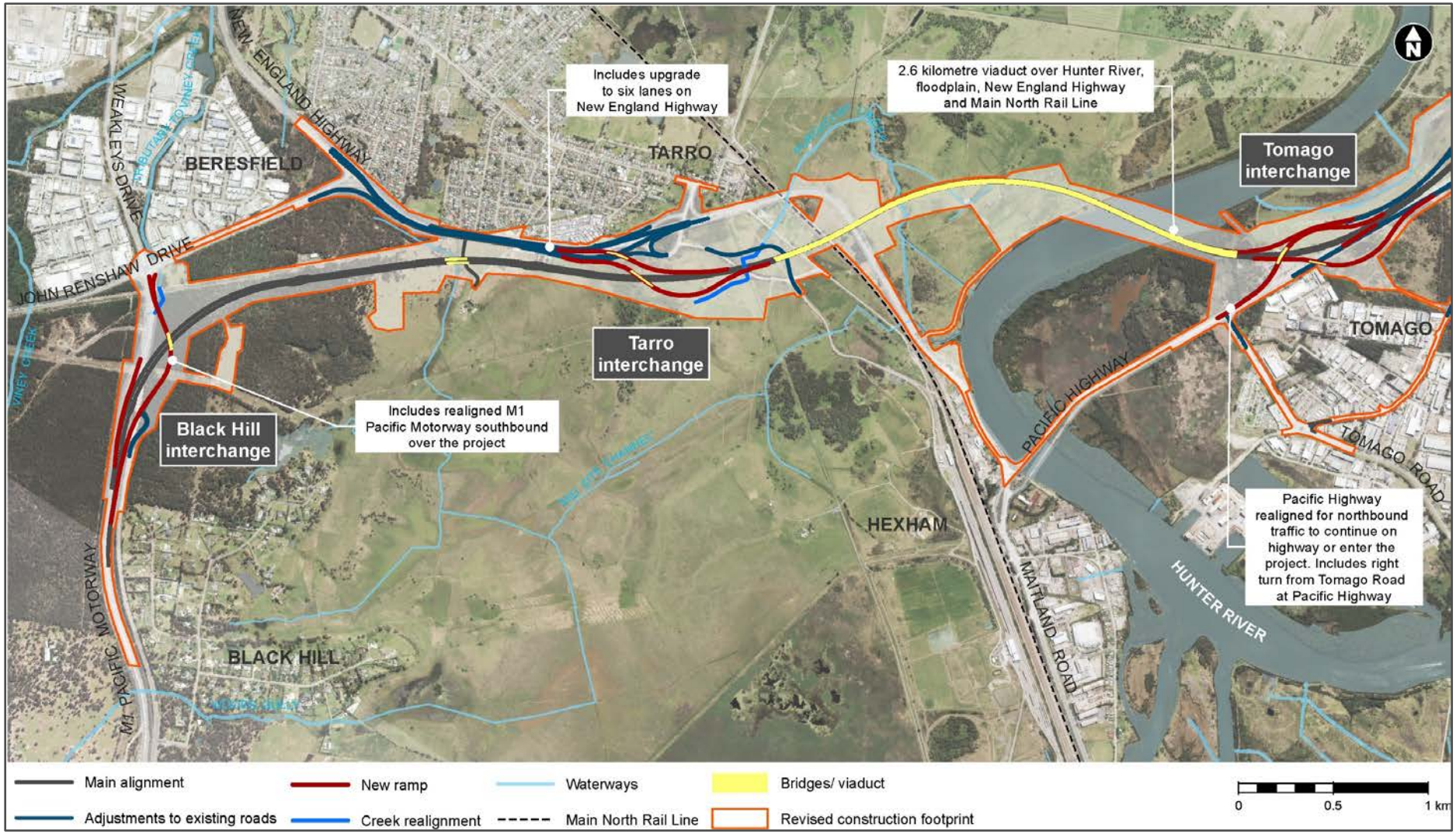


Figure 1 | Project alignment (Source: RtS)

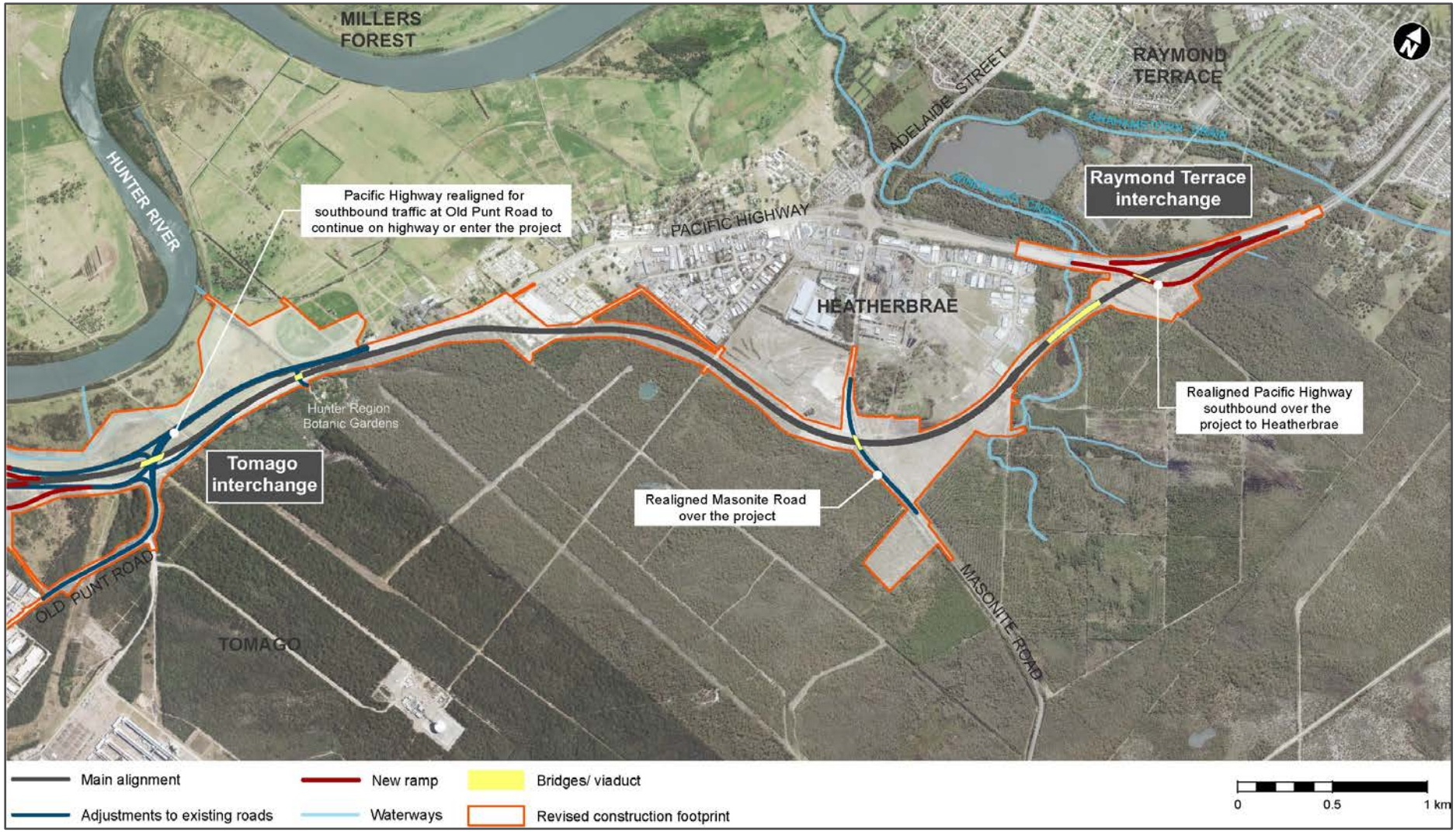


Figure 2 | Project alignment (Source: RtS)

Figure 3 | Tarro Interchange photo montage (Source: TfNSW)

Figure 4 | Tomago Interchange photo montage (Source: TfSW)

Figure 5 | Hunter River bridge photo montage (Source: TfNSW)

Figure 6 | Hunter River bridge photo montage (Source: TfNSW)

2 Project

2.1 Physical layout and design

The main components and operational features of the project are described in **Table 1**.

Table 1 | Main Components of the Project (Source: RtS)

Aspect	Description
Project summary	• Fifteen kilometre, four-lane divided motorway from Black Hill to Raymond Terrace • 2.6 kilometre main viaduct over the Main North Rail Line, New England Highway and the Hunter River and floodplain • Four grade separated interchanges (Black Hill, Tarro, Tomago, and Raymond Terrace)
Interchanges	• Black Hill interchange providing access to the existing road network including John Renshaw Drive, Weakleys Drive and the Beresfield industrial precinct, forming half of the full interchange • Tarro interchange providing access to the existing road network including the New England Highway • Tomago interchange providing access to the existing road network including the Pacific Highway, Old Punt Road, Tomago Road, and the Tomago industrial precinct • Raymond Terrace interchange providing access to the existing road network and Heatherbrae
New England Highway upgrade	• Widening of the New England Highway from four to six lanes, between John Renshaw Drive and the Tarro interchange • Realigning the existing westbound carriageway and John Renshaw Drive exit to accommodate the northbound entry ramp to the main alignment • Constructing an additional lane of the existing westbound highway to provide access for the southbound exit ramp from the main alignment • Modifying the existing New England Highway exit ramp to Anderson Drive, and modifying the Anderson Drive westbound entry ramp to the New England Highway, to merge with the main alignment exit ramp to the New England Highway
Local road changes or upgrades	• Re-aligning and widening Masonite Road, including construction of a new bridge over the main alignment • Pavement and kerb adjustments to parts of Old Punt Road to cater for heavy vehicle movements and utilities work, including intersection upgrades • Upgrading Old Punt Road and Pacific Highway intersection • Realigning the existing Pacific Highway near the Hunter Region Botanic Gardens, with a new signalised intersection connecting to a new access road to the gardens • Realigning the Aurizon Access Road at Tarro to pass under the main alignment viaduct
Bridges	• 12 new bridge structures, including a viaduct across the Hunter River and its floodplain
Noise abatement structures	• Low noise pavement • New and extended noise barriers • At-property architectural noise treatment at residences identified as eligible for noise mitigation

Waterway adjustments	• Realigning around 150 metres of an artificial drainage tributary of Viney Creek to approximately 70 metres to the east • Realigning around 320 metres of Purgatory Creek to accommodate the Tarro interchange
Permanent water quality basins	• 26 basins for stormwater detention and spill containment
Fauna crossing and structures	• Glider Poles on Old Punt Road • Three fauna rope crossings (two at Black Hill, one at Heatherbrae) • Fauna exclusion fencing on both sides of the alignment from Black Hill to Tarro, Tomago to Heatherbrae (eastern side of alignment), and eastern side of Pacific Highway at Raymond Terrace
Pedestrian and cycling facilities	• Signalised pedestrian crossing at the Hunter Region Botanic Gardens • Relocating existing cycling crossings and the creation of additional crossings • Provision for cyclists on wide road shoulders along the motorway.

2.2 Proposed construction works

The construction footprint will be approximately 450 hectares, and includes the area required for road work, bridge and viaduct work, access for construction vehicles and plant, drainage infrastructure, utility and service adjustments, construction and operational water quality controls measures, temporary stockpiles, and construction ancillary facilities. The key construction works are summarised in **Table 2**.

Table 2 | Main construction components of the project (Source: RtS)

Aspect	Description
Low impact work and early work activities	• Utility works including adjustment, protection and augmentation • Site establishment including fencing and hoarding, construction ancillary facilities, vegetation clearing • Installation of environmental controls including temporary or permanent fencing, and erosion and sediment control mitigation measures • Remediation e.g. RZM site at Tomago, removal of pre-existing waste and weed control • Native seed collection, revegetation and landscaping work • At-property acoustic treatments
Bulk earthworks	• Excavation of bulk earthwork cuttings and stabilisation of cut batters • Rock removal using rock breakers, hammers or controlled rock blasting • Crushing and screening • Haulage of materials from excavated cuttings, borrow sites and external sources to fill locations • Construction of embankments and earth mounds including foundation drainage • Ground improvement activities
Bridges and overpasses	• Construction of wharf areas for loading and unloading of plant and equipment from barges on Hunter River • Construction of temporary platforms to enable construction of Hunter River crossing piers located on the bank and in the Hunter River • Construction of bridge and abutment foundations (bored or driven piles) • Installation of embankment and utility service piles (at required locations)

	• Construction of pile caps • Construction of bridge abutments and piers • Construction of bridge superstructure including deck and road surface (cast in situ or precast bridge elements) • Installation of environmental controls such as scour protection, erosion control measures and reinforced soil walls where required • Dewatering
Road works	• Road upgrades and widening, kerbs and guttering • Pavement rehabilitation of the New England Highway, Pacific Highway, and Old Punt Road and where the project ties into the existing road network • Asphalting and concrete surfacing
Construction ancillary facilities	• Establishment and use of temporary ancillary facilities, access tracks and haul roads, laydown areas and clearing • Operation of ancillary facilities, including stockpiling, delivery and storage of materials, and worker parking • Operation of concrete batch plant and pre-cast fabrication, crushing and screening of excavated material, stockpiling and loading activities
Drainage and water quality control	• Installation of cross drainage including culverts, and inlet and outlet work (channel diversions and scour protection) • Installation of water quality control measures, including drainage, temporary sediment basins and swales • Dewatering of sediment basins as required
Other aspects	• Protection or relocation of utilities • Adjustments of waterways where required, including Viney Creek and Purgatory Creek • Temporary and permanent property adjustments and property access refinements as required • Demolition of dwellings and farm sheds • Clearing and grubbing of vegetation • Mulching of vegetation for reuse in landscaping activities (where possible)
Landscaping	• Progressive landscaping and tree planting • Rehabilitation and reinstatement of existing conditions • Landscape maintenance
Finishing works	• Line marking and safety barriers • Landscaping works • Demobilisation and rehabilitation of construction ancillary facilities • Installation of directional signage, roadside furniture, variable message signs, and lighting.

Potential sites that could be used as construction ancillary facilities are shown in **Figure 7** to **Figure 8**. The proposed activities at the 21 potential sites are provided in **Table 3**.

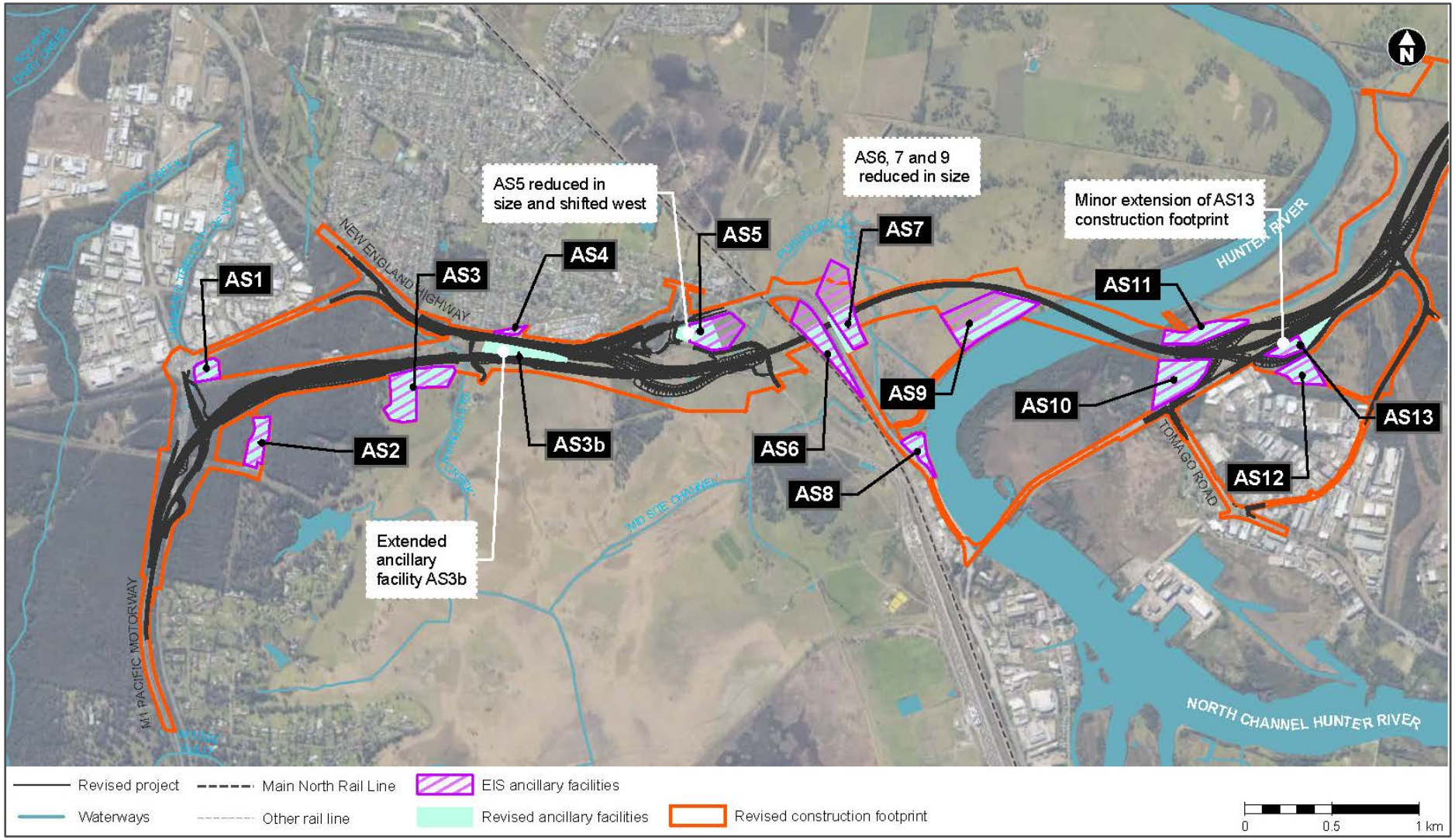


Figure 7 | Location of construction ancillary sites (Source: RtS)

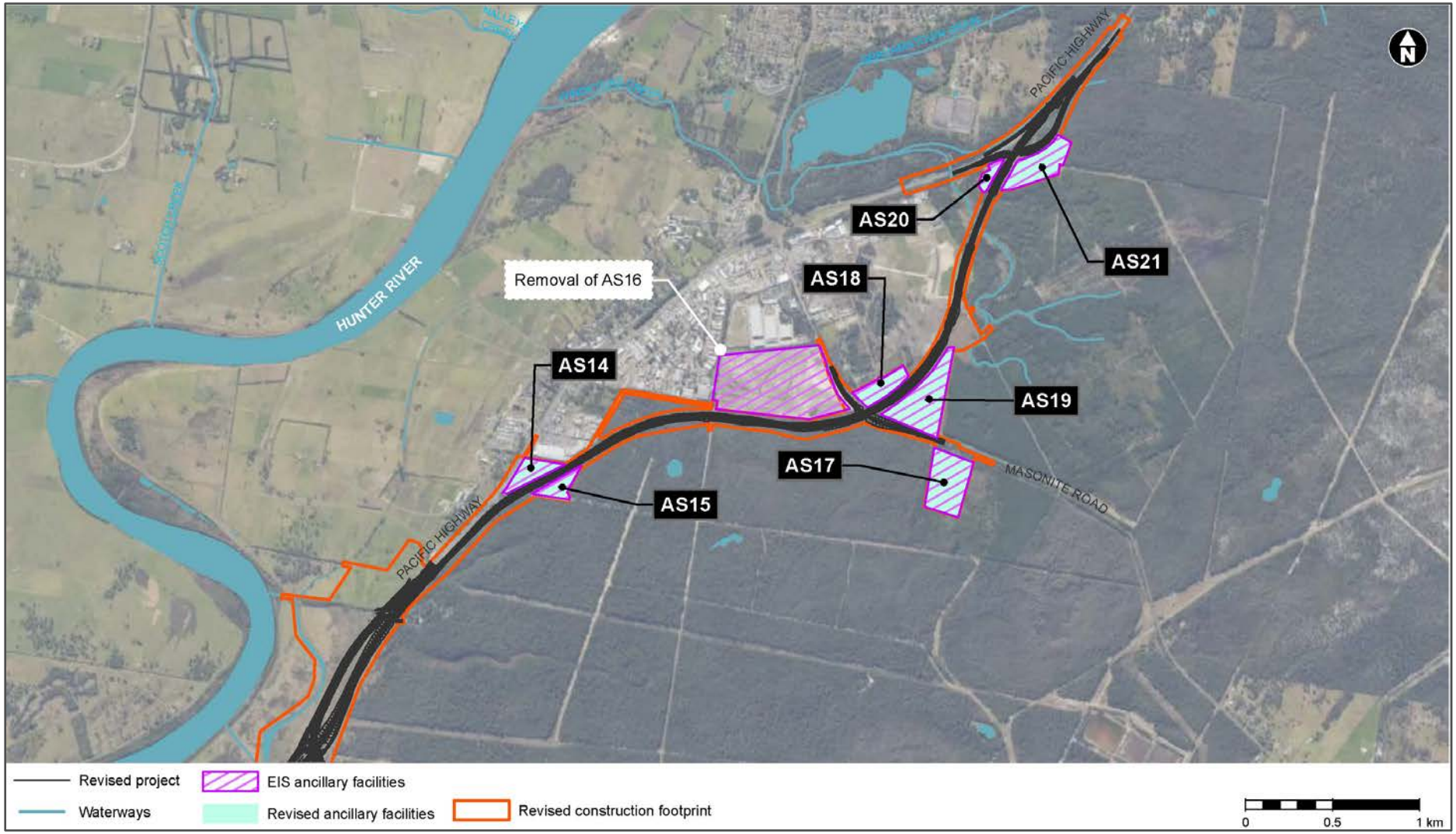


Figure 8 | Location of construction ancillary sites (Source: RtS)

Table 3 | Proposed construction ancillary facility locations and uses (Source: RtS)

Ancillary facility	Location	Laydown	Stockpiles	Crushing and materials processing	Concrete batching	Concrete precast yard	Acid sulfate soil treatment	Main compound (including parking)	Wharf facilities	Asphalt batch plant	Satellite compound	Car parking	Established for enabling work	Interchange	Viaduct (B05)	Bridge
AS1	Black Hill: Corner John Renshaw Drive and M1 Pacific Motorway	■	■								■		■	■		■
AS2	Black Hill: East of M1 Pacific Motorway	■	■								■			■		■
AS3	Black Hill: South of New England Hwy and transmission line easement	■	■	■	■	■	■	■		■			■	■	■	■
AS3b	Black Hill: South of New England Hwy	■	■				■	■			■		■	■		■
AS4	Tarro: North of New England Hwy	■	■									■		■		
AS5	Tarro: South of New England Hwy, west of Woodlands Close	■	■				■				■		■	■	■	■
AS6	Tarro: West of Maitland Road/New England Hwy	■	■								■		■		■	
AS7	Tarro: East of Maitland Road/New England Hwy	■	■	■	■	■	■	■		■					■	
AS8	Tarro: East of Maitland Road/New England Hwy and west of Hunter River	■	■								■				■	
AS9	Tarro: East of Purgatory Creek, north of Hunter River	■							■		■				■	

Ancillary facility	Location	Laydown	Stockpiles	Crushing and materials processing	Concrete batching	Concrete precast yard	Acid sulfate soil treatment	Main compound (including parking)	Wharf facilities	Asphalt batch plant	Satellite compound	Car parking	Established for enabling work	Interchange	Viaduct (B05)	Bridge
AS10	Tomago: North-west of Pacific Hwy and south of Hunter River. South of main alignment															
AS11	Tomago: North-west of Pacific Hwy and south of Hunter River. North of main alignment															
AS12	Tomago: South of Pacific Hwy and east of Tomago industrial area. South of main alignment															
AS13	Tomago: South of Pacific Hwy and east of Tomago industrial area. North of main alignment															
AS14	Heatherbrae: East of Pacific Hwy, south of Heatherbrae commercial area. North of main alignment															
AS15	Heatherbrae: East of Pacific Hwy, south of Heatherbrae commercial area. South of main alignment															
AS17	Heatherbrae: South of Masonite Road															

Ancillary facility	Location	Laydown	Stockpiles	Crushing and materials processing	Concrete batching	Concrete precast yard	Acid sulfate soil treatment	Main compound (including parking)	Wharf facilities	Asphalt batch plant	Satellite compound	Car parking	Established for enabling work	Interchange	Viaduct (B05)	Bridge
AS18	Heatherbrae: South of Pacific Hwy and east of Masonite Road. North of main alignment															
AS19	Heatherbrae: South of Pacific Hwy and east of Masonite Road. South of main alignment															
AS20	Raymond Terrace: South of Pacific Hwy, west of main alignment															
AS21	Raymond Terrace: South of Pacific Hwy, east of main alignment															

2.3 Proposed construction hours

The Interim Construction Noise Guideline (DECC, 2011) (ICNG) sets the standard construction hours of 7:00 am to 6:00 pm on weekdays and 8:00 am to 1:00 pm on Saturdays. The Proponent requested the following extended construction hours: an extra hour at the start and end of each day Monday to Friday (i.e. 6:00 am start and 7:00 pm finish), and an extra five hours on Saturday. The main rational for extended construction hours is ensuring delivery of the benefits of the project as soon as possible. The proposed hours and activities are summarised in **Table 4**.

Table 4 | Proponent's request to extend construction hours (Source: RtS)

Day	Start Time	Finish Time	Construction activities during extended hours
Monday to Friday	6:00 am	6:00 pm	• 6:00 am to 7:00am: construction activities (e.g. toolbox meetings, preparation of equipment) that do not result in noise levels above the relevant construction noise management level at the nearest affected residential receiver • 7:00 am to 6:00 pm: general construction activities
Saturday	7:00 am	5:00 pm	General construction activities
Sunday and public holidays	No extended hours proposed		Nil

If blasting is required, this would be subject to the ICNG standard construction hours and would be regulated under an environment protection licence (EPL) issued by the Environment Protection Authority (EPA).

In addition to the proposed standard and extended construction hours, some out-of-hours work would be needed. These works include roadway resurfacing, short-term traffic diversions, operation of concrete and asphalt batching plants within ancillary facilities, bridge construction work over the Main North Rail Line and existing roads such as the New England Highway, and utility modifications.

The Department's consideration of activities outside the ICNG standard hours and the Proponent's request for extended construction hours is discussed in **Section 6.2– Noise and Vibration**.

2.4 Timing and workforce

Construction of the project is expected to commence in 2023 and finish in 2028 (see **Table 5**). The construction program will be updated and confirmed by the construction contractor once the tender for construction is awarded. The construction workforce is expected to peak at approximately 1,050 workers per year.

Table 5 | Indicative construction program (Source: Submissions Report)

Construction component	Year 1	Year 2	Year 3	Year 4	Year 5
Early / low impact work and utilities					
Construction of ancillary facilities					
Operation of ancillary facility					
Drainage and water quality control					
Clearing, grubbing, and demolition					
Bulk earthwork					
Pavements					
Bridges and viaducts					
Roadside furniture and finishing work					
Traffic management and control					
Landscaping					

2.5 Staged opening

The project will be delivered as two major construction contracts – the 10 kilometre southern stage (Black Hill to Tomago) and the five kilometre northern stage (Heatherbrae bypass) (refer **Figure 9**). The Proponent identified the opportunity for potential staged opening of the project, being the early opening of the Heatherbrae bypass section as construction of this section would be shorter in duration. A temporary intersection at the tie in point for the northern stage has been designed to accommodate the potential staged opening of the project. Early opening would provide benefit to motorists in terms of reduced travel times between Tomago and Raymond Terrace.

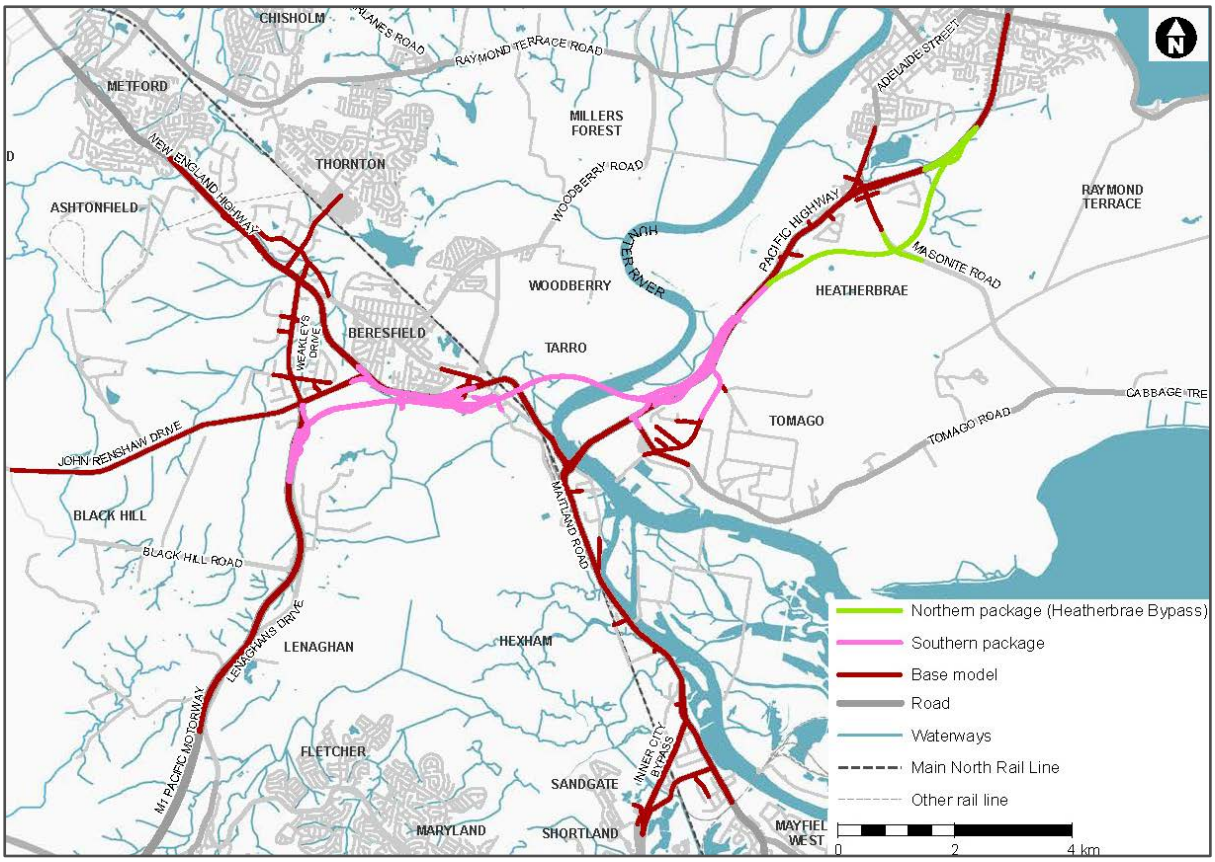


Figure 9 | Proposed staging of the project (Source: RtS)

Two options for the interchange at Heatherbrae were considered as shown in **Figure 10** and **Figure 11**. Option 1 was selected as it provides faster travel times (17 seconds quicker in the AM peak and 19 seconds quicker in the PM peak) and is easier to construct.

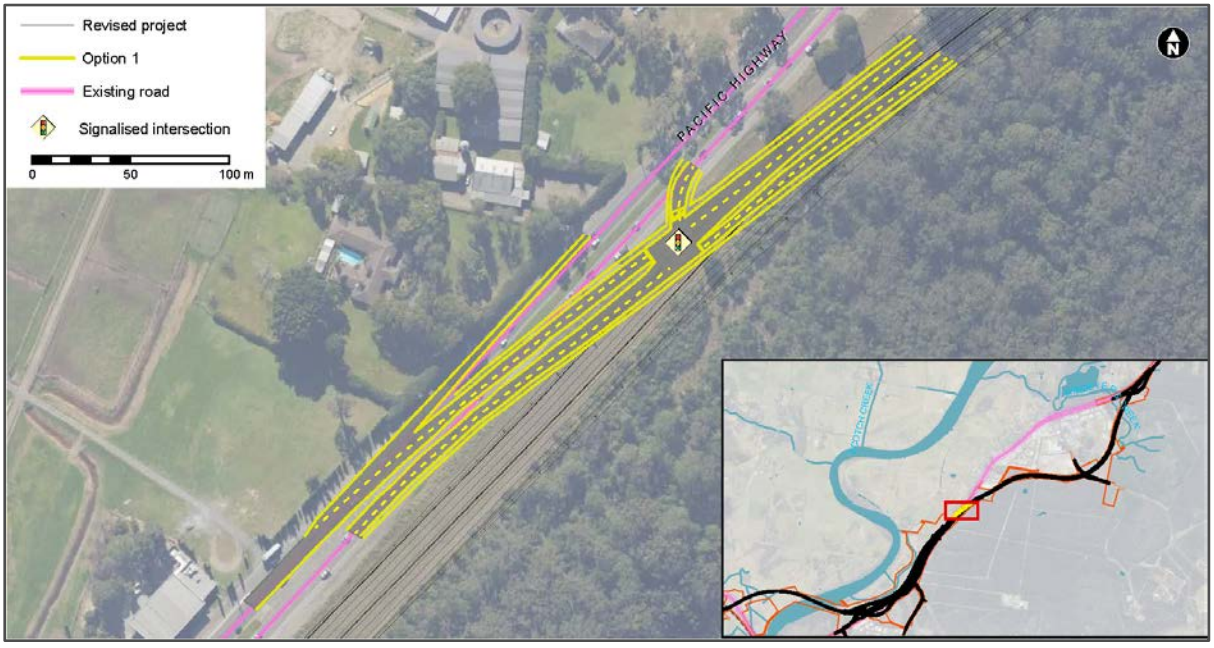


Figure 10 | Option 1 of the Heatherbrae interchange and the existing motorway (Source: RtS)

Figure 11 | Option 2 of the Heatherbrae interchange and the existing motorway (Source: RtS)

3 Strategic context

3.1 Project justification

The upgrade of the Pacific Highway will provide a four-lane divided road from Hexham to the Queensland border. As of 2021, 95 per cent of the Pacific Highway north of Beresfield has been upgraded to free-flowing dual carriageways. Currently, Coffs Harbour and Hexham / Heatherbrae are the only two locations linking Brisbane, Sydney, Canberra, and Melbourne where the route remains an urban road with traffic signals.

The project area is in one of the most highly trafficked areas of the road network in the Hunter region and more heavily congested than the adjacent sections of the M1 Pacific Motorway and Pacific Highway corridor. The existing Pacific Highway through Beresfield, Hexham and Heatherbrae is a medium to low-speed arterial road with five traffic light-controlled intersections, two grade separated interchanges, and one roundabout controlled intersection (see **Figure 12**). The use of at-grade traffic light-controlled intersections causes increasing traffic congestion on the route and major delays resulting in increased travel times and lower vehicle efficiency. Demand is expected to increase along the alignment as a result of both population growth and increased freight demands. Further, the Pacific Highway north of the Hunter River has its highest peak flows between the Hunter River and Tomago. This area of the network is constrained and congested due to capacity constraints at the older southbound bridge, and traffic signals at the intersection with the New England Highway.

Currently, the road network in the Hexham/Sandgate/Tomago area is not able to cater for high productivity vehicles (HPV's) due to the height and weight restrictions imposed by the Pacific Highway southbound bridge crossing the Hunter River. The load carrying capacity of the bridge is limited to B-Doubles at mass limits of up to 68 tonnes. HPVs, such as Performance Based Standard (PBS) 2B A-Doubles of up to 91.5 tonnes, are not permitted to use the bridge.

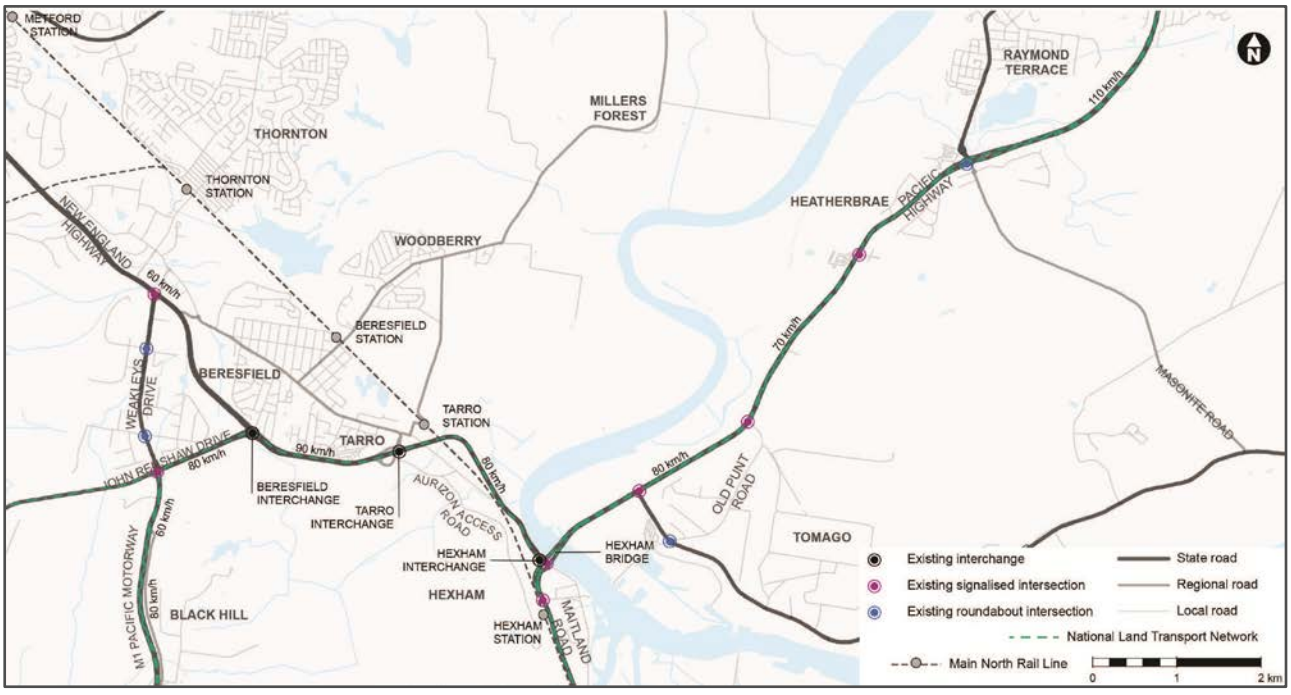


Figure 12 | Existing road and rail infrastructure (Source: EIS)

Key benefits provided by the project include:

- free-flowing dual carriageway conditions between Sydney and the Queensland border
- improved travel time and road network efficiency for commuters and freight, particularly during peak travel periods
- improved road safety by removing through traffic from the existing road network
- provision of increased road capacity to cater for increasing and future traffic volumes
- improved flooding immunity, reducing the number of disruptions on the new road caused by major weather events.

Further, the project would support the growth and development of employment precincts at Beresfield, Black Hill, Thornton, and Tomago. The Beresfield and Black Hill precincts are proposed to be a freight and logistics hub, with complementary manufacturing and light industrial activity. Tomago is proposed to be an advanced manufacturing and industrial area, while the Thornton precinct will support expanded business and light industrial uses. All four precincts have the potential to generate significant volumes of traffic, and construction of the project will facilitate accessibility for freight to these future employment areas. **Figure 13** shows the current and future development near the project alignment.

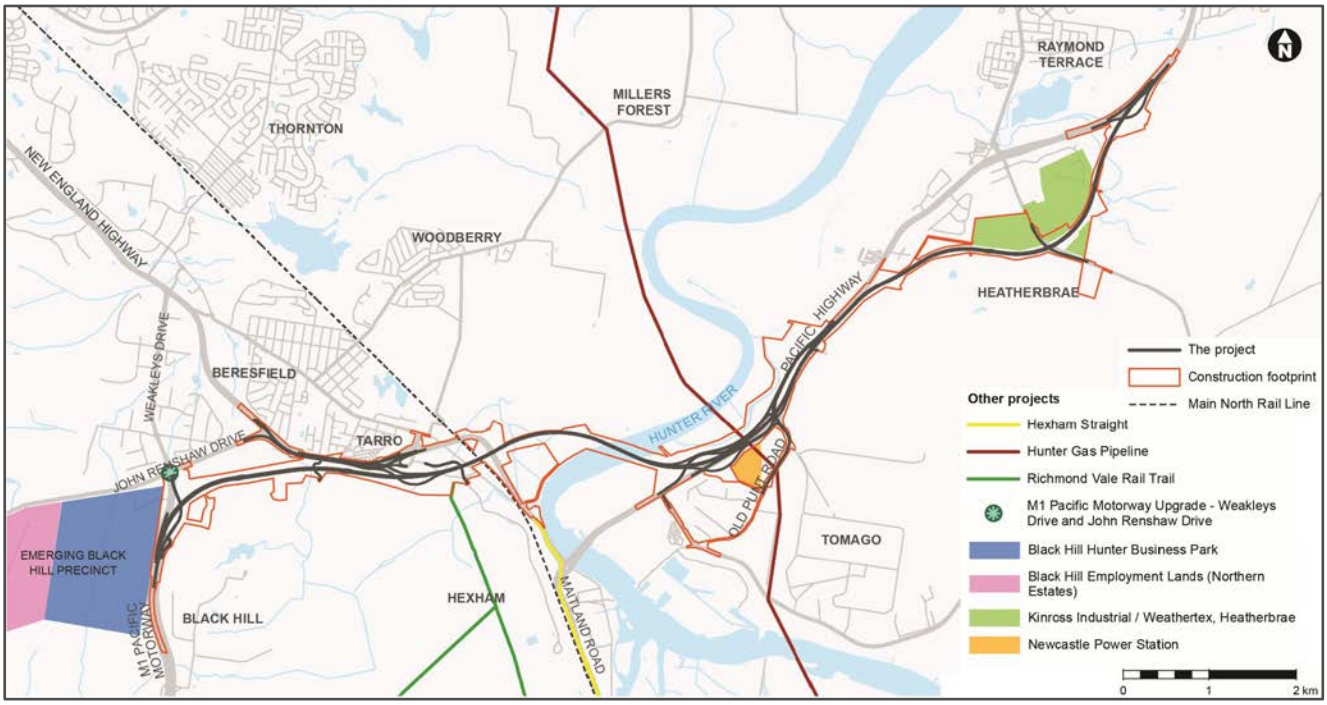


Figure 13 | Current and future development near the project alignment (Source: EIS)

3.2 Strategic justification

The project is aligned with the vision and outcomes of the TfNSW *Future Transport Strategy 2056* and is identified in the supporting document *Regional NSW Services and Infrastructure Plan* (TfNSW, 2018) as a committed initiative for the next 0–10 years. It addresses outcomes by providing improved travel times and more efficient travel, better connections to activate regional and metropolitan centres, improving freight efficiency, access and reliability on roads, and safer roads that support optimum speeds and are resilient to weather events.

The project is consistent with the Commonwealth and NSW strategic planning policy framework, including:

- *NSW State Infrastructure Strategy 2018-2038* (Infrastructure NSW, 2018) - the project aligns with the Strategy as it will improve traffic flow and travel times for freight as well as improved safety for local traffic
- *Making it Happen in the Regions: Regional Development Framework* (DPI, 2017) - the Framework focuses on providing quality services and infrastructure in regional NSW. The project will provide travel time savings for traffic (including freight) and safer road conditions to support growth and tourism
- *National Road Safety Strategy 2021 – 2030* (Commonwealth of Australia, 2021) - the Strategy details Commonwealth government's commitment to reduce fatal and serious injury crashes on Australian roads. The project aims to significantly reduce road crashes and injuries by providing safer road conditions and removing through traffic from the local road network
- *NSW Freight and Ports Plan 2018 –2023* (TfNSW, 2018) - the project is consistent with the aims of the Plan to make the freight system more efficient, more accessible, and safer, as it will provide an efficient freight route through the Hunter Region
- *Regional NSW Services and Infrastructure Plan* (TfNSW, 2018) - the Plan aims to produce a multi-modal freight transport network and lift freight productivity. The project will enable HPVs to use this section of the road network for the first time. They are currently unable to due to weight and height restrictions on the existing road corridor
- *Australian Infrastructure Plan and Priority List* (Infrastructure Australia, 2016)- the Plan identifies that at-grade intersections reduce network speeds and economic performance, and highlights that the existing road network does not cater for HPVs. This project eliminates at-grade intersections for through traffic on the M1/A1 road corridor through Hexham and Heatherbrae as well as allowing for HPVs to use this section of the road network
- *National Freight and Supply Chain Strategy* (Transport and Infrastructure Council, 2019) - the project is consistent with the Strategy in that it will improve access to major freight gateways, and will increase efficiency in freight movements between Sydney and Brisbane
- *Lower Hunter Regional Strategy 2006 –2031* (Department of Planning, 2006) - the project aligns with the Strategy in that it will improve traffic movement through the Lower Hunter and accommodate the anticipated increase in traffic
- *Hunter Regional Plan 2036* (Department of Planning and Environment, 2016) - the Plan specifically recognises the need to extend the M1 Pacific Motorway to Raymond Terrace
- *Hunter Regional Transport Plan* (TfNSW, 2014) - the Transport Plan identifies the need to ensure the efficient movement of freight within the Hunter Region. The project will provide an improved route for freight and reduced travel times
- *Greater Newcastle Future Transport Plan* (TfNSW, 2018) - the project supports the objectives outlined in the Plan as it would increase connectivity across the region and allow for decreased travel times

- *City of Newcastle Local Strategic Planning Statement* (City of Newcastle, 2021) - this Statement identifies Black Hill as being a key catalyst area, and the project supports this by improving transport connectivity with Black Hill
- *Raymond Terrace and Heatherbrae Strategy 2015 – 2031* (Port Stephens Council, 2015) - the project aligns with the Strategy goal to enhance transport and mode connectivity, including road, public transport, footpath and cycleway connections, within Raymond Terrace and Heatherbrae, as it provides new road infrastructure that would improve accessibility and connectivity between Raymond Terrace and the M1 at Black Hill.

3.3 Project alternatives

The project development process considered possible alternative ways of meeting the project objectives, with the following alternatives considered.

Alternative 1: Do nothing (base case)

The 'do nothing' alternative involves retaining the existing route between the M1 Pacific Motorway and Raymond Terrace, via John Renshaw Drive, New England Highway, and Pacific Highway. Ongoing maintenance of existing roads such as line-marking, refurbishing the road pavement surface, and maintaining the verge and median would still occur.

The 'do nothing' alternative would provide no additional transport capacity, travel saving times, nor improve safety in the road network, and was therefore discounted as a realistic alternative and not considered further.

Alternative 2: Do minimum

The 'do minimum' alternative involves retaining the existing route between the M1 Pacific Motorway and Raymond Terrace, via John Renshaw Drive, New England Highway, and Pacific Highway. Ongoing maintenance of existing roads such as line-marking, refurbishing the road pavement surface, and maintaining the verge and median would still occur.

Other upgrades planned for the network would be progressed including:

- Pacific Highway, Maitland Road, and New England Highway intersection upgrade west of the Hexham Bridge
- duplication of Weakleys Drive between John Renshaw Drive and New England Highway, and the conversion of roundabouts to signalised intersections
- implementation of ramp metering at the Anderson Drive eastbound onramp to the New England Highway.

The 'do minimum' alternative would add capacity to the road network at key pinch points, providing short to medium benefits to traffic flow. Similar to the base case, doing the minimum would result in an increase in travel times due to increased traffic volumes and congestion on the road network. The stop and go pattern in congested traffic leads to a likely increase in crashes. As such, the 'do minimum' alternative was discounted as a realistic alternative and not considered further.

Alternative 3: Rail as an alternative mode of transport and freight

This alternative would involve using the existing rail network to support north-south transport and freight in this location.

This alternative would not meet the objectives of State and Federal strategic planning and transport policies as discussed in **Section 3.2**, including completion of the broader Pacific Highway upgrade program and completing a critical link in the NLTN. Additionally, while this alternative would remove some vehicles from the existing road network, it would only partially contribute to improving travel times on key roads and road safety, therefore not meeting the project objectives. The Department notes that other freight rail improvements are underway, such as the Inland Rail program of works, which will increase the capacity of north-south freight movements by rail.

The rail alternative was therefore discounted as a realistic alternative and not considered further.

Alternative 4: Establishing a primary route to the west

This alternative would involve using the existing inland route between the Hunter Region and the Queensland border via the New England Highway (the western route), instead of along the Pacific Highway (the coastal route). This route is currently available to road users as the alternate route to the Pacific Highway, serving a smaller number of road users and linking a smaller population base.

This alternative was therefore discounted as a realistic alternative and not considered further.

Alternative 5: M1 Pacific Motorway extension to Raymond Terrace (the project)

This alternative would develop a continuous motorway-standard route between Sydney and Brisbane by:

- completing a critical link in the NLTN, specifically the coastal Sydney to Brisbane Corridor
- completing the missing link required to realise the full transport benefits of the Pacific Highway upgrade program.

This alternative also responds to and supports the NSW and Australian Government strategic planning and transport policies detailed in **Section 3.2**.

3.4 Preferred route selection

In 2004, 14 possible routes were identified with three selected for further analysis (routes A, B and C as shown in **Figure 14**). Following further investigations, Option C was discounted on the basis of geotechnical issues and cost. Options A and B were progressed and split into three sections, a western section (1), central section (2), and eastern section (3). These options were publicly exhibited between October and December 2005. Following value management and route options workshops in 2005 and 2006, a combination of Option A1, B2 and B3 was considered to best satisfy community expectations and this preferred route was publicly displayed between August and October 2006.

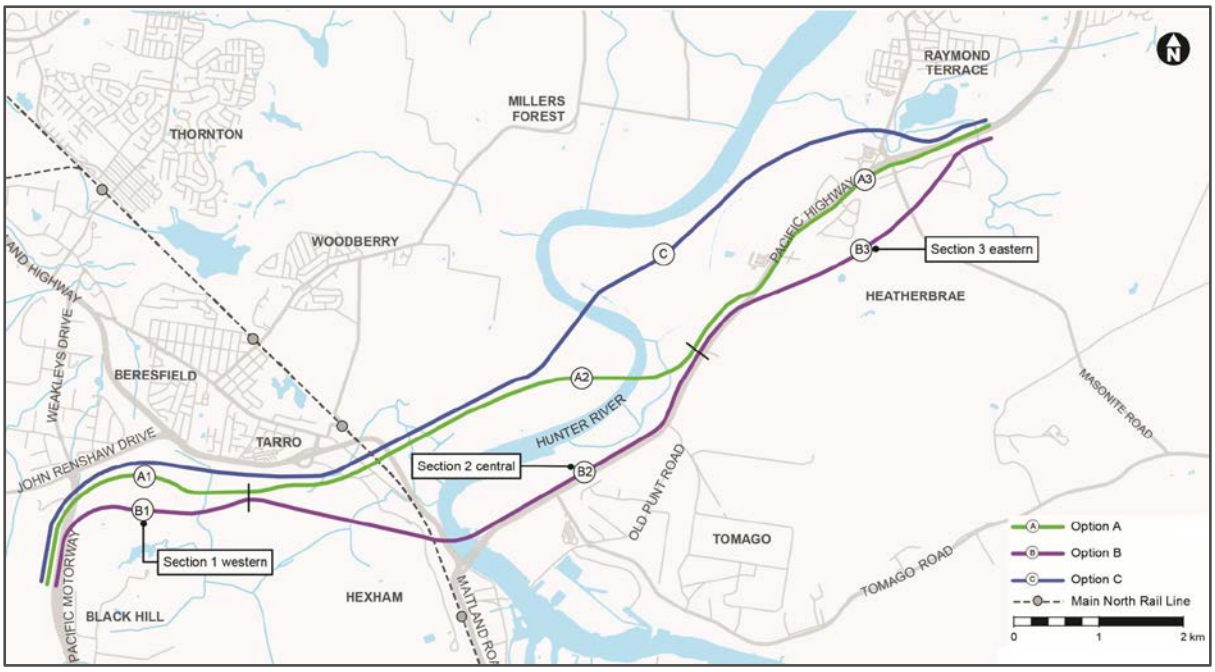


Figure 14 | 2006 – Early-stage route options considered for the project (Source: EIS)

Following consideration of community and stakeholder feedback, the preferred route was progressed into a concept design, which was displayed to the community between July and August 2008. In 2010, a corridor was preserved in the Newcastle and Port Stephens Local Environmental Plans, the route being generally consistent with the preferred route identified in 2006.

In 2014, improvements were made to the proposed 2010 concept design, identifying alternate alignments (**Figure 15**) which improved accessibility and connectivity across the road network, addressed design constraints in crossing the Hunter River and floodplain, and reduced environmental impacts. Further refinements were made to the project, and in October 2015, a new preferred alignment was announced. In 2016, a more refined concept design was released based on further feedback from the community and stakeholders and field investigations. The preferred 2016 concept design (based on the 2015 preferred alignment) is shown in **Figure 16**.

Further community consultation was carried out in August and September 2016, with additional targeted consultation over the following years. This led to further design refinements as shown in **Figure 17**, improving access to the Hunter Region Botanic Gardens and private properties.

The preferred option (the current project), shown in **Figure 17**, has either avoided or minimised environmental impacts. These include, but are not limited to:

- Biodiversity: minimising direct impacts to coastal wetlands (identified in *State Environmental Planning Policy (Resilience and Hazards) 2021*) ; avoiding and minimising impacts to floodplain wetlands and associated biodiversity with a viaduct across the Hunter River floodplain instead of an embankment; minimising fragmentation of habitat, including koala habitat, by aligning the project close to existing infrastructure and land use; avoiding impacts to remnant vegetation and potential habitat for threatened species; minimising connectivity impacts; avoiding a population of the Commonwealth-listed Grevillea parviflora subsp. parviflora with the removal of the link road at Tomago.

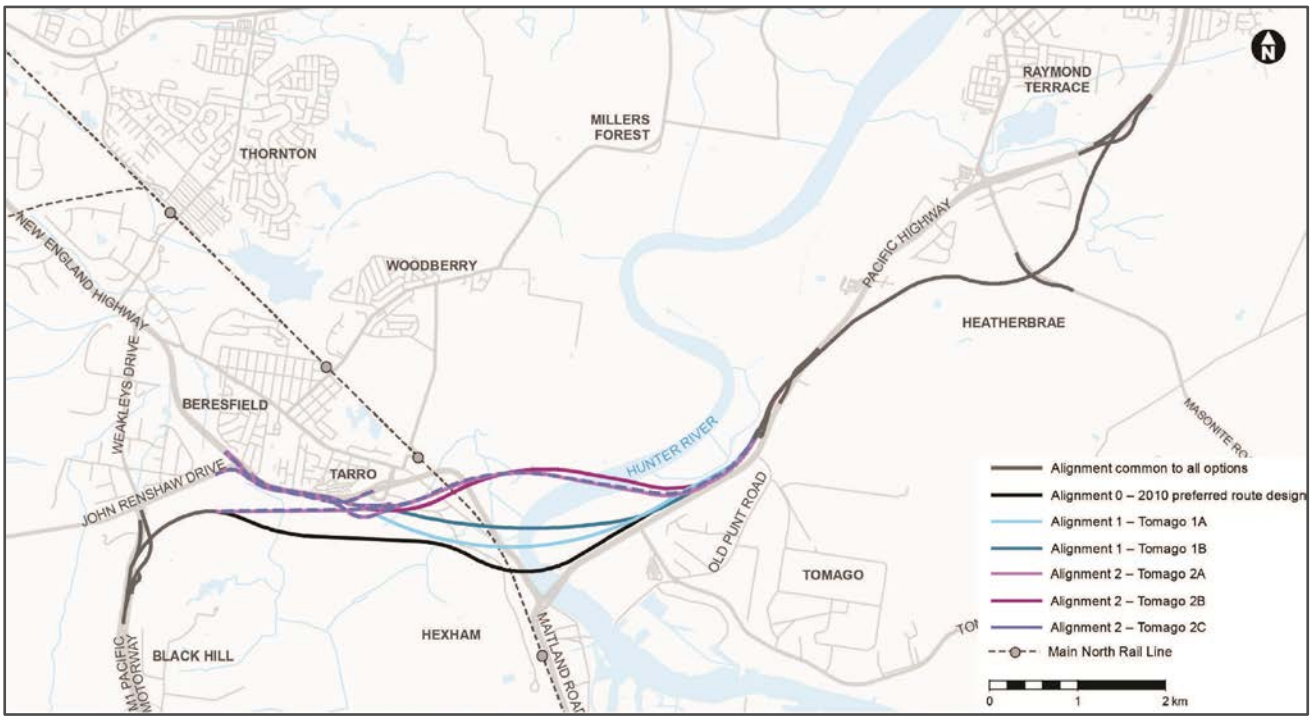


Figure 15 | 2014 alignment options (Source: EIS)

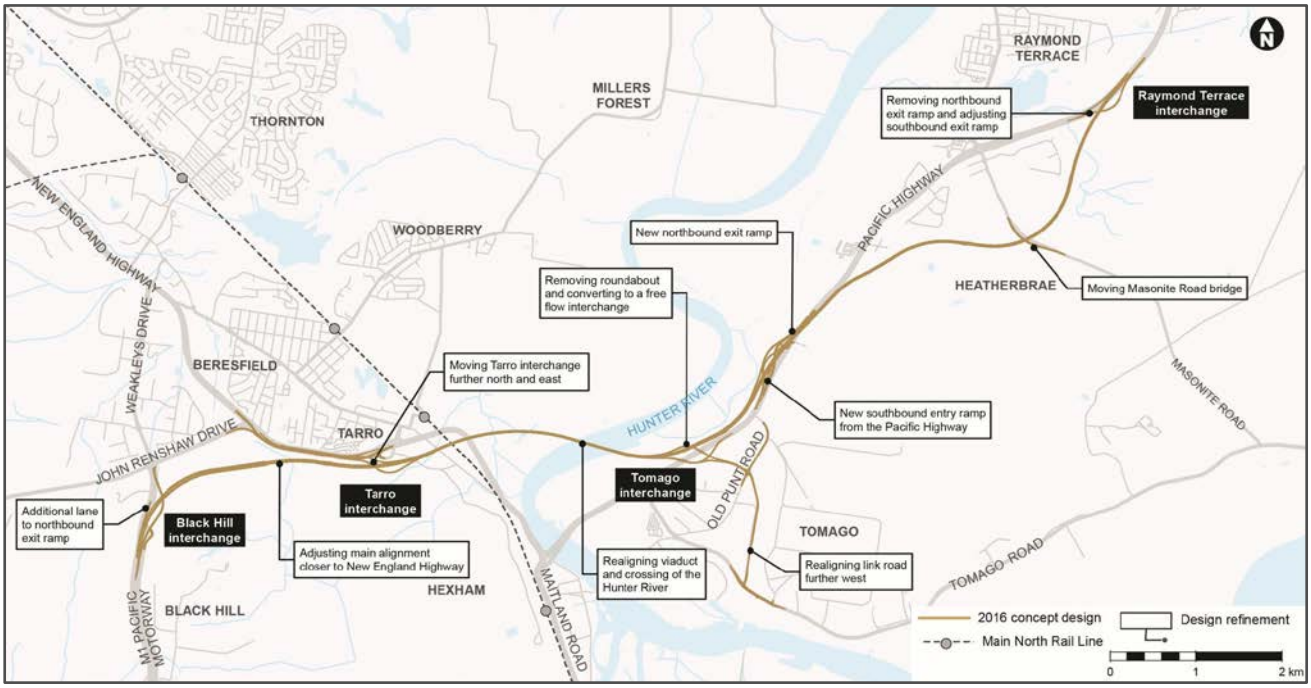


Figure 16 | Preferred option - 2016 concept design (Source EIS)

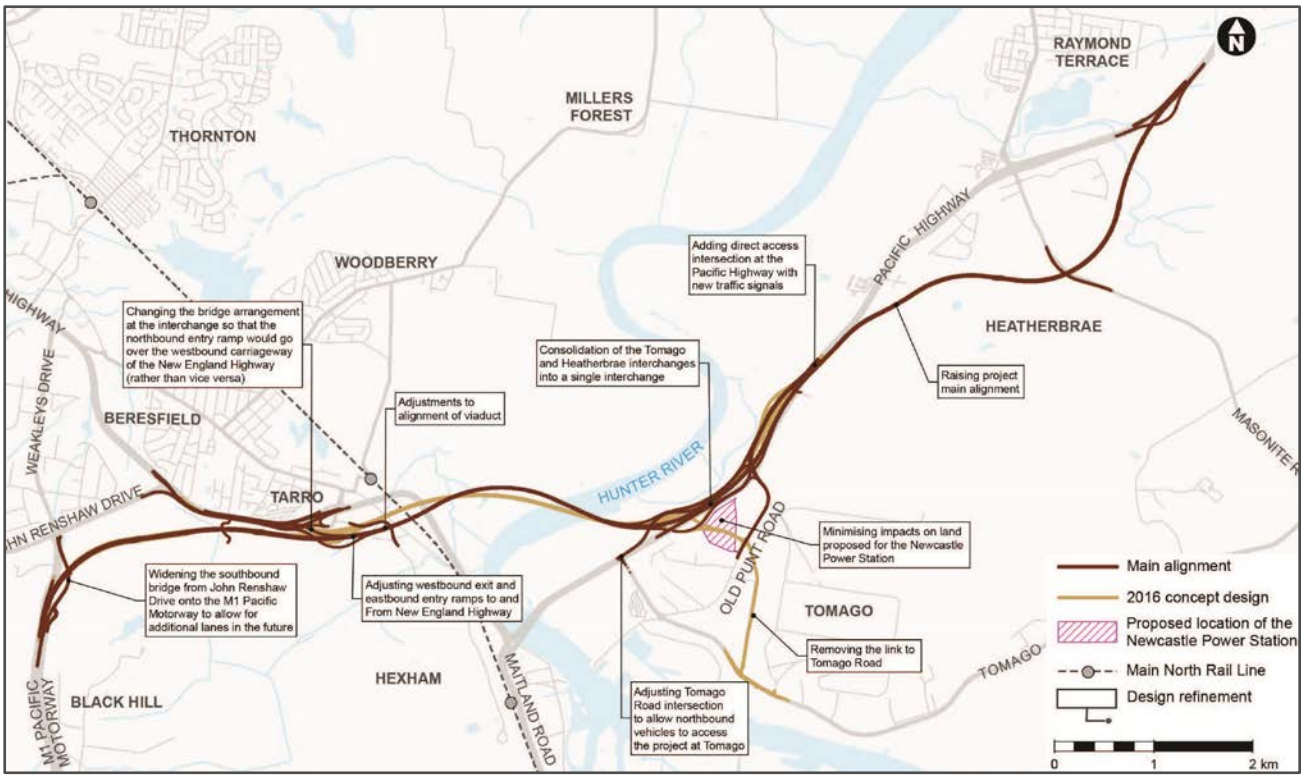


Figure 17 | Preferred option and design refinements (Source: EIS)

- Hydrology and flooding: minimising substantial upstream flooding impacts by replacing the proposed embankment with a 2.6 kilometre-long viaduct across the Hunter River floodplain and providing multiple bridges across waterways. This would minimise impact to upstream drainage capacity, flood storage and conveyance and local afflux
- Water quality: minimising surface water quality impacts by realigning the project with less impacts across the floodplain, and minimising groundwater impacts by reducing soft soil consolidation activities
- Non-Aboriginal heritage: minimising impacts to Glenrowan Homestead complex, and avoiding impacts to Hexham Bridge, Hexham Shipbuilding Yards, and Hannell Family Vault structure
- Land use and property: refined alignment is more closely aligned to existing infrastructure, reducing land severance and impacts to existing properties and land use
- Social impacts: design changes providing improved interchange arrangements at Black Hill and Tarro, and at Tomago and Raymond Terrace, that improve accessibility and minimise impacts to existing businesses at Beresfield and Heatherbrae.

4 Statutory context

4.1 Critical State significance

The project is critical State significant infrastructure (CSSI) pursuant to section 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Minister for Planning is the approval authority.

4.2 State and Commonwealth approvals and legislation

State approvals and legislation

The project is for the purpose of a road or road infrastructure facilities and is characterised as development permitted without consent, in accordance with clause 2.109 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (the Transport and Infrastructure SEPP). In accordance with section 5.22(2) of the EP&A Act, the only environmental planning instruments that apply to the project are the Infrastructure SEPP insofar as it relates to the declaration of development that does not require consent and *State Environmental Planning Policy (Planning Systems) 2021* as it pertains to the declaration of infrastructure as State significant infrastructure. No other environmental planning instruments govern the carrying out of the project.

The construction of the project is likely to require an environment protection licence issued under the *Protection of the Environment Operations Act 1997*.

Other legislation that applies to the project includes *Land Acquisition (Just Terms Compensation) Act 1991* and the *Contaminated Land Management Act 1997*.

Commonwealth approvals and legislation

On 14 January 2019, the former Commonwealth Department of the Environment and Energy (now the Commonwealth Department of Climate Change, Energy, the Environment and Water - DCCEEW) determined the project to be a 'controlled action' under sections 18 and 18A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), as it was considered likely that the project could have a significant impact on listed threatened species and communities.

Following notification from the Commonwealth of the decision that the project was a controlled action, the Department confirmed that the project would be assessed under the then NSW Bilateral Agreement with the Commonwealth (now the Amending Agreement No. 1). Under this agreement, the Commonwealth accredited the assessment process under the EP&A Act for the purposes of the EPBC Act, enabling a single assessment of the project. This includes endorsement of the *Framework for Biodiversity Assessment* (FBA) and *NSW Biodiversity Offsets Policy for Major Projects* as providing a basis for the assessment of biodiversity values under the EPBC Act. Accordingly, NSW has assessed the potential impacts on the relevant Matters of National Environmental Significance (MNES) in accordance with the requirements of the bilateral agreement.

The relevant controlling provision of the EPBC Act is threatened species and ecological communities. The assessment of MNES is provided in **Section 6.3** of this report and includes sufficient detail such that the Commonwealth decision-maker may consider those impacts when determining whether to

approve the project. Additionally, this Assessment Report makes a recommendation and proposes conditions to the Commonwealth Minister for the Environment and Water in relation to an approval decision.

4.3 Mandatory matters for consideration

Objects of the *EP&A Act*

The determination must have regard to the objects of the EP&A Act. The Department has considered the objects of the EP&A Act including:

- ecologically sustainable development (ESD) (**Section 4.3** and **6**)
- social and economic welfare (**Section 6**)
- justification of the project, in terms of the orderly and economic use and development of land and how it would affect travel and access (**Section 6**)
- protection of the environment, in relation to biodiversity, traffic, noise and vibration, air quality, surface and groundwater hydrology, urban design, amenity, and social and economic issues (**Section 6**)
- sustainable management of built and cultural heritage, including Aboriginal cultural heritage (**Section 6**)
- good design and amenity of the built environment (**Section 6**)
- promoting shared responsibility for environmental planning and assessment between the different levels of government (**Section 5**)
- community participation in the assessment of the project (**Section 5**)

Ecologically sustainable development

The EP&A Act adopts the definition of ESD in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in the decision-making process and that ESD be achieved through the implementation of:

- the precautionary principle
- inter-generational equity
- conservation of biological diversity and ecological integrity
- improved valuation, pricing and incentive mechanisms.

Project objectives which guide the delivery and operation of the project would contribute to the sustainability of the project and the meeting of ESD principles. In addition to the objectives, the Proponent has addressed the above principles directly in both the Environmental Impact Statement (EIS) and Submissions Report (RtS) and identified a range of mitigation measures to manage impacts associated with these issues. These include sustainable procurement practices, minimising water use during construction, considering opportunities for water reuse, using endemic species in landscaping, and offsetting of biodiversity impacts.

The Department has recommended conditions of approval requiring:

- preparation of a Sustainability Strategy, that will be implemented throughout construction and operation of the project
- achievement of a minimum "Excellent" 'Design' and 'As built' rating under the Infrastructure Sustainability Council infrastructure rating tool (Version 1.2).

The precautionary principle is applied throughout the EIS, and the Department considers the assessment and range of mitigation measures adequately adopt the principle. The Department is satisfied that the valuation and pricing of the environmental resources associated with the project have been adequately undertaken and internalised through the project design and mitigation measures.

4.4 Framework for Biodiversity Assessment

The project is a pending planning application under the Biodiversity Conservation (Savings and Transitional) Regulation 2017. Clause 28 of this Regulation states that the former planning provisions under the *Threatened Species Conservation Act 1995* (TSC Act) continue to apply (and Part 7 of the *Biodiversity Conservation Act 2016* (BC Act) does not apply) to the determination of a pending or interim planning application.

In accordance with the Regulation, since substantial environmental assessment was undertaken prior to the commencement of the BC Act, the project has been assessed under the repealed TSC Act and in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* which is underpinned by the *Framework for Biodiversity Assessment* (OEH, 2014). As all threatened species, ecological communities and their habitats are now listed under the BC Act, the biodiversity assessment and report for the project refers to these listings.

In accordance with the TSC Act, the biodiversity values of the study area have been assessed under the *Framework for Biodiversity Assessment* (OEH, 2014). The study area comprises a 15-kilometre-long construction footprint and a landscape buffer of 550 metres extending from the construction footprint. The Proponent has prepared a Biodiversity Assessment Report (BAR). Impacts to the biodiversity values from the project area have been detailed in the updated BAR in the RtS.

5 Engagement

5.1 Department's engagement

The Planning Secretary is required to make the EIS publicly available in accordance with section 5.28(1)(c) of the EP&A Act. The Department placed the EIS and accompanying documents on exhibition from 28 July to 24 August 2021 (28 days) on the Department's Major Projects website.

Notification of the exhibition of the EIS was advertised in The Australian, Newcastle Herald, and Port Stephens Examiner newspapers on 28 and 29 July 2021. The Department notified relevant State and local government authorities of the exhibition.

Due to the timing of the exhibition period and assessment during the COVID-19 pandemic, standard exhibition procedures such as displaying physical copies of the EIS for public exhibition at local libraries and council offices, and community information sessions, were unable to proceed in compliance with NSW Government Public Health Orders.

The Proponent held three online forums in August 2021 during the exhibition period where Departmental staff were observers.

The Department undertook a site visit as part of the Planning Focus Meeting held in late 2015 and again before the EIS exhibition, to obtain a comprehensive understanding of the surrounding environment and its sensitivities.

The Department held a range of discussions with relevant State agencies during its assessment of the project. The Secretary's Environmental Assessment Requirements (SEARs) were prepared in consultation with regulatory agencies and councils. The Department hosted a Planning Focus Meeting in October 2015 which was attended by the Proponent, relevant Government agencies and City of Newcastle and Port Stephens Councils.

5.2 Summary of advice received from Government agencies

During the exhibition period, the Department received advice from seven Government agencies. Further advice was then sought on the Submissions Report received on 27 June 2022. A summary of the advice from agencies is in **Table 6**. A link to the full copy of the advice is in **Appendix C**.

Table 6 | Summary of agency advice

Biodiversity and Conservation Division - NSW Environment and Heritage Group (BCD)	
EIS	NSW Environment and Heritage Group - Biodiversity and Conservation Division (BCD) provided comments on biodiversity, including clarifications on aspects of the survey effort and biodiversity assessment. EHG (BCD) raised concerns regarding the flooding assessment methodology and requested further information from the Proponent.
Submissions Report	EHG (BCD) is satisfied that recommendations of EHG's (BCD) biodiversity comments on the EIS were satisfactorily addressed in the Submissions Report. Further details are to be provided on the survey effort for *Acacia bynoeana*, *Corybas dowlingii*, *Cryptostylis hunteriana* and *Diuris praecox*. If targeted survey requirements cannot be met, further surveys should be undertaken, or an expert report should be prepared, or the species should be assumed to be present.
Department of Primary Industries (DPI Fisheries)	
EIS	DPI Fisheries made comments regarding offsetting of saltmarsh communities and marine vegetation, and requiring the preparation of an offset and restoration strategy for tidal flows to rehabilitate remaining salt marsh, and encourage the restoration of a gradational wetland. DPI Fisheries requested conditions relating to an offset management plan, design of creek crossings, wastewater/stormwater management, and sediment and erosion control.
Submissions Report	DPI Fisheries recommends changing mitigation measure B07 “Management measures will be developed in consultation with DPI Fisheries” to “The footprint of mangrove clearing will be refined in consultation with DPI Fisheries to ensure harm is minimised as far as possible.”
Environment Protection Authority (EPA)	
EIS	EPA raised significant concerns in relation to noise, including noise monitoring, extended construction hours, out-of-hours work, management and mitigation of construction noise and the maximum noise levels for operational noise. EPA also raised concerns relating to water quality, including the interception of the groundwater table by sediment basins, water pollution, hydrogeology, and the protection of the drinking water catchment. Significant concerns were also raised regarding the assessment of contamination.
Submissions Report	EPA reviewed the Submissions Report and noted the supplementary reports for noise and vibration, surface water and groundwater, and soils and contamination satisfactorily addressed its EIS comments. The only remaining concern was to have a more absolute commitment for a Contaminated Lands Management Plan to be prepared and finalised prior to construction commencing (including early works).
Heritage NSW (Aboriginal Cultural Heritage Regulation Branch) - Environment and Heritage Group	
EIS	Heritage NSW – Aboriginal Cultural Heritage Regulation Branch supported the proposed mitigation measures outlined in the EIS and recommended preparation of an Unexpected

	Finds Procedure for Aboriginal objects. It also recommended Aboriginal cultural heritage awareness training induction for contractors, developed in conjunction with Registered Aboriginal Parties (RAPs) and an appropriately qualified archaeologist.
Submissions Report	Heritage NSW – Aboriginal Cultural Heritage Regulation Branch indicated that the revised environmental management measures predominately addressed the recommendations provided on the EIS. However, there has been no provision in the mitigation measures for the RAPs and an appropriately qualified archaeologist to develop the induction program. It is suggested that this is explicitly stated to ensure that appropriate information is shared with construction personnel and a real culture of awareness of Aboriginal heritage values and management is present for the project.
Heritage NSW – Heritage Council of NSW	
EIS	Heritage NSW – Heritage Council of NSW indicated support for the assessment approach and proposed mitigation measures. Heritage NSW suggested potential conditions of approval including the preparation of a site-specific Archaeological Research Design Excavation Methodology and an Unexpected Finds Procedure.
Submissions Report	Previous comments about non-Aboriginal heritage provided on the EIS have been adequately responded to in the Submissions Report. No further comments on non-Aboriginal heritage were provided.
Water Group - Department of Planning and Environment (DPE Water)	
EIS	DPE Water recommended the realignment of Purgatory Creek mimics natural stream design, and that the final project design aligns with the Hunter Valley Flood Mitigation Scheme. DPE Water expressed the need for the Proponent to commit to remediate any disturbance to the banks and adjacent floodplain of the Hunter River, outlined requirements for the Water Management Plan for the project, and recommended the continuation of groundwater monitoring program prior to construction.
Submissions Report	DPE Water repeated advice provided during EIS exhibition and recommended final construction plans include: • location of piers relative to the Hunter Valley Flood Mitigation Scheme assets, ideally the bridge piers should not be located on any levees • scour protection must be provided around piers in close proximity to the levee to minimise erosion during flood events • a revised flood model of the final design is to be provided identifying the hydraulic impacts for the design events exceeding the 10% AEP. DPE Water requested the Proponent refer to *Guidelines for Controlled Activities on Waterfront Land* (NRAR, 2019) for works on waterfront land and within watercourses. Proposed revegetation within riparian zones should consider the guidelines for Vegetation Management Plans, accommodate a fully structured vegetated riparian zone using indigenous species, and revegetation should also include a maintenance component post-revegetation.
Hunter Local Land Services (Hunter LLS)	
EIS	Hunter LLS expressed their preference for prioritising remediation works over monetary compensation when offsetting aquatic habitat impacts. In particular, Hunter LLS

	expressed their interest in discussing the ecological restoration of properties adjacent to the Hunter River which were purchased by the Proponent for the project.
Submissions Report	Hunter LLS did not comment on the Submissions Report.

5.3 Summary of submissions

During the exhibition period, the Department received a total of 49 unique submissions on the project. Of the submissions received, one was from a State-owned corporation, three were from local councils, 10 were from special interest groups and 35 were from community members. Two form letters (duplicate submissions) were received from one individual community member. Seventeen submissions were in support of the project, seven submissions objected to the project, and 25 submissions provided comments. The majority of community submissions were received from individuals located within the Hunter Region. Three individual submissions were received outside of the Hunter Region, two located within the Sydney Metropolitan area, and one located interstate. A summary of the submissions is provided in **Table 7** to **Table 9**, and a link to the full copy of submissions is in **Appendix C**.

Table 7 | Summary of State-owned Corporation submissions

Hunter Water Corporation (HWC)	
EIS	Hunter Water Corporation (HWC) discussed the need for ongoing discussions with the Proponent for the management of its assets impacted by the project and identified potential impacts on the Tomago Sandbeds aquifer. HWC also suggested consideration of Biodiversity Stewardship Agreements for its landholdings and recommended alternative biodiversity offset options to offset the projects biodiversity impacts.
Submissions Report	HWC provided the following comments: • request that the Proponent continue to liaise with HWC regarding the management of surface water and groundwater quality impacts on the Tomago Sandbeds drinking water catchment and ensure compliance of sediment basin water quality discharge during operation of the project • supportive of groundwater reuse in principle and will continue to liaise with the Proponent about options for re-infiltration of groundwater within the Tomago Sandbeds catchment area where considered appropriate • not supportive of re-injecting intercepted groundwater within the Tomago Sandbeds aquifer for risk management reasons • the Proponent continue to liaise with HWC on surface water and groundwater monitoring requirements (including the development of a Trigger Action Response Plan) in the Tomago Sandbeds catchment area during the construction and operational stages of the project, taking into consideration that all basins are proposed to be lined to prevent pollution of the aquifer • management controls to be implemented at proposed ancillary facility sites within the Tomago Sandbeds catchment area need to consider the sensitivity of the underlying aquifer given the highly permeable nature of the soils. This is particularly the case for site Ancillary Site 17 (AS 17), which is located entirely within the draw zone of Tomago Borefields Station 2.

Table 8 | Summary of Council submissions

City of Newcastle	
EIS	City of Newcastle provided the following comments: • raised concerns regarding the traffic impacts and modelling associated with the Emerging Black Hill Precinct and future south connections to the M1 • suggested consultation in planning for a cycleway connection between Hexham and Tarro and the desire to maintain separation of the cycleway from Aurizon access road • recommended conditions relating to stormwater discharge, impacts to culverts and the pipe network • raised concerns regarding the hydrological design targets for Coastal SEPP wetlands • additional clarifications for flooding impacts were requested • recommended conditions for biodiversity protection • raised concerns regarding impacts to the broader landscape setting of heritage items • recommended reducing adverse impacts to areas of known Aboriginal cultural heritage sensitivity • comments relating to location of ancillary facilities, conditions for cranes and tall structures in relation to potential impacts to aircraft from the RAAF Base at Williamtown, property ownership and leading agreements, access trails, and bushfire risk relating to co-location of any required fire trails within existing easements.
Submissions Report	City of Newcastle acknowledged the Submissions Report addressed the majority of their EIS comments. However, generic responses were provided on Council's concerns over traffic generation from the Black Hill precinct. Council acknowledged the Proponent's assurances that the potential traffic and transport impacts of the project to the Emerging Black Hill Precinct have been thoroughly assessed and traffic modelling carried out for the project has subsequently been used for further assessments such as the SMEC (2020) report prepared for TfNSW, with the background growth rates and future traffic from the Black Hill Emerging Precinct being applied consistently in the various assessments carried out. Council expressed disappointment that the design allowance for a future southern connection is outside the scope of the current project. Council noted that pollution reductions targets for water quality as nominated in *Newcastle Development Control Plan 2012* are required for stormwater drainage systems within the Newcastle Local Government Area. While it is acknowledged that the requirements of the plan do not apply to State significant infrastructure, the designs of the nominated basins and other stormwater quality improvement devices should aim to meet these targets, where possible.
Port Stephens Council	
EIS	Port Stephens Council provided the following comments: • recommendations regarding biodiversity protection and offsetting, including for koalas, endangered ecological communities (EEC), *Diuris arenaria* and Eastern Grass Owl • provision of adequate signage, public open space and community facilities to offset impacts to established businesses that cater for motorists in Heatherbrae and Raymond Terrace • TfNSW should reclassify Old Punt Road and Masonite Road as State roads to enable local infrastructure contributions to be reallocated to local roads.
Submissions Report	Council provided the following comments on flooding and drainage: • clarification should be provided on how climate change impacts were taken into account and that the project has been future-proofed • works will result in an increase in flood levels across the floodplain and that this will have a cumulative impact on the potential for development in impacted areas

	• flood modelling data and construction and operation flood mapping layers should be provided to relevant council's whose local government area are impacted by the proposed project to enable each council to update their flood mapping at an appropriate time • the process of updating council flood mapping data is time consuming and flood data related to this proposed project should ideally be provided to councils well in advance of any potential impacts being realised.
Maitland City Council	
EIS	Maitland City Council indicated support for the project and provided the following comments: • the project would provide benefits for traffic flows and local industrial areas • haulage along local roads in the Maitland local government area are queried given impacts to residential areas and the local road network • concerns regarding whether the flood study considers potential impacts of sea level rise, particularly upstream of the viaduct • further consideration of impacts on coastal zone management and estuary management is required.
Submissions Report	Maitland City Council did not comment.

Table 9 | Summary of submissions

Submitter	Number	Position
Special Interest Groups		
Newcastle Airport Pty Limited	1	Comment
Correct Planning and Consultation for Mayfield	1	Comment
Newcastle Greens Local Government Reference Group	1	Comment
Richmond Vale Rail Trail Supporter's Group (RVRT)	1	Support
Black Hill Environment Protection Group and Buttai Community Development Group	1	Support
Koala Koalition EcoNetwork Port Stephens	1	Comment
AGL Energy Limited	1	Comment
Aurizon	1	Object
Muree Golf Club	1	Comment
7-Eleven Stores Pty Ltd	1	Object

Submitter	Number	Position
Unique submissions as form letters or petitions	1	
Individual community member	2 (3 total form letters)	Support
Unique submissions from community members		
Unknown location	1	Comment
< 5 km	2	Object
	4	Support
	6	Comment
5–100 km	2	Object
	8	Support
	9	Comment
> 100 km	1	Object
	1	Support
	1	Comment
TOTAL	**35**	

5.4 Key issues raised

The Department received submissions from 35 community members and ten from special interest groups/organisations.

The key issues related to the proposal are summarised below.

Project justification

- project size and cost
- suggest other proposed upgrades could deliver traffic benefits and cost savings.

Project design

- suggest design changes to integrate with other projects such as the Lower Hunter Freight Corridor and Inland Rail network
- engineering of the road corridor to consider future technologies such as electric vehicles, hydrogen power and driverless technologies
- suggest design changes to provide travel time savings for Port Stephens residents
- opposition to Black Hill industrial estate interchange due to the access route compromising the amenity of a semi-rural community.

Traffic, transport and access

- benefits of the project for reducing congestion and road accidents and providing travel time savings
- clarifications for impacts on continued property access during construction and operation
- suggest changes to construction material haulage routes to reduce congestion on local roads
- traffic generated from the Black Hill Industrial Precinct
- encouragement of car use resulting in new traffic bottlenecks and exhaust pollution.

Noise and vibration

- noise impacts on residents during construction and operation
- suggests extending acoustic barriers and reinforcing existing barriers.

Social, economic, land use, and property

- exacerbation of health and social impacts for communities
- clarification of the construction footprint and its impact on Muree Golf Club
- bypass impacts on business profitability in the industrial area and the subsequent need to encourage road users to stop over in Heatherbrae/Raymond Terrace
- compensation for land use and consultation regarding asset relocation/reinstatement
- use of existing concrete pre-cast yards to reduce economic impacts.

Biodiversity

- impacts to flora and fauna
- suggests measures to protect habitat for native wildlife (particularly koalas) including preservation of habitat corridors, fauna fencing and fauna crossings
- lack of offset credits in proximity of the project and request that offsets result in environmental benefits locally, particularly for local koala habitat.

Urban design

- visual impacts from the project and its associated structures and lighting
- vegetation barriers to soften the appearance of concrete noise walls
- suggestion for the road corridor underneath the viaduct to be opened to provide public access to the Hunter River
- design improvements for active transport connectivity especially to the proposed Richmond Vale Railway Trail.

Flooding, hydrology and water quality

- flooding impacts to property as a result of run off during construction/operation and slower drainage after flood events, particularly due to climate change
- access to flood modelling data to assess project impacts.

Other comments

- air quality impacts during operation
- impacts to sites of Aboriginal significance
- bank stabilisation is required near viaduct due to erosion vulnerability
- project should identify a carbon budget and offset omissions to ensure the project is carbon neutral
- recommendations for further consultation and the establishment of a Community Consultation Panel.

5.5 Response to submissions (RtS)

The Department provided the Proponent with all submissions following exhibition of the EIS and requested the Proponent prepare a response to submissions. The Proponent's RtS (Appendix D) was made publicly available on the Department's Major Projects website on 27 June 2022 and forwarded to the relevant agencies and councils for comment.

During the exhibition of the EIS, the Proponent made five design refinements to the project which were addressed in the Submissions Report and are set out in **Table 10**. Government agencies and councils did not comment on design refinements presented in the Submissions Report.

Table 10 | Design and construction refinements presented in the Submissions Report

Change	Justification
Design refinements	
Extension of the southbound M1 Pacific Motorway merge lane by approximately 200 metres for traffic from the John Renshaw Drive/Weakleys Drive intersection.	To improve safety for southbound merging traffic flows in accordance with NSW road design guidelines.
Utilities strategy refinements including: • grouping of utilities at Tarro and Tomago into 12 metre wide utility corridors • extension of utility adjustments on the northern side of John Renshaw Drive between Weakleys Drive and New England Highway at Black Hill • extension of utility adjustments south of Tomago Road at Tomago and the New England Highway at Hexham.	Discussions with utility providers have identified refinements to utility management to meet the project and utility providers' needs.
Refinements to the cycleway strategy, including a new road culvert adjacent to the realigned Aurizon access road, additional cyclist provisions at the Tomago interchange, and removal of the shared user path on the new Masonite Road bridge.	Recommendations from consultation with City of Newcastle Council were incorporated into the design to improve safety and connectivity for cyclists.
Relocation of a permanent basin and extension of drainage works on the western side of the realigned Pacific Highway, and provision of tail	Consultation with a property owner has revealed that the water quality basin and drainage work refinements on the western side of the realigned Pacific Highway would

out drainage lines to Windeyers Creek at Heatherbrae.	minimise impacts to the property owner. The provision of tail out drainage lines ensures the eastern side of the main alignment is effectively connected to Windeyers Creek.
Temporary sediment basins and permanent water quality control basis that intercept groundwater would be lined with impermeable material.	Consultation with the EPA identified that lining the basins would prevent mixing of surface water and groundwater, and therefore minimise groundwater quality impacts.
Construction refinements	
Ancillary facilities and site access – minor changes to the size, location and access arrangements of some ancillary facilities.	To reduce flooding and biodiversity impacts associated with ancillary facilities and access tracks.
Earthworks management – identification of a borrow pit and sites for beneficial reuse of materials within the construction footprint.	To allow more efficient materials handling and further opportunities for beneficial reuse of materials on site during construction.
Project boundary refinements	
Consultation with landowners and the design and construction refinements to reduce property and biodiversity impacts have resulted in minor changes to the construction and operational project footprint.	Project boundary refinements have been made to both the construction and operational footprints to reduce property and biodiversity impacts as well as to incorporate design changes, utility adjustments and refinements to ancillary facilities
Construction staging	
Staged project opening - the project would be delivered via two packages of work, the Southern (Black Hill to Tomago) and Northern (Heatherbrae bypass) works, with the Northern section likely having a shorter construction duration.	Early completion of the Northern section may allow this stage to open to traffic before the Southern section.

6 Assessment

The Department, in its assessment of the project including submissions received and agency advice, identified and considered in this report include flooding and hydrology, traffic and transport, noise and vibration, social and economic issues, land and property use, and biodiversity (**Sections 6.1** to **6.5** respectively). Other issues considered are discussed in **Section 6.6**.

6.1 Traffic and Transport

The project would provide a new motorway corridor between the M1 at Black Hill and the Pacific Highway at Raymond Terrace and would provide benefits across the traffic network. The project would reduce pinch points in the regional road network by bypassing five sets of traffic lights between the existing M1 Pacific Motorway / Weakleys Drive / John Renshaw Drive intersection at Black Hill, the intersection at Pacific Highway / Hank Street at Heatherbrae and the existing Hunter River bridge, and provide increased reliability and network safety.

The project has been designed to not preclude the future development of the Lower Hunter Freight Corridor proposal and design features have been included where the project interacts to allow for the future freight proposal.

The project has been designed in consideration of surrounding residents and the local environment, and will provide a safer local road network through the transfer of traffic onto the new motorway and off State roads used by locals to traverse the local suburbs of Beresfield, Black Hill, Tomago, Tarro, Hexham, Heatherbrae, and Raymond Terrace.

Construction traffic impacts are considered acceptable as the majority of construction traffic movements would be along the existing arterial road network. However, there will be use of local roads and traffic impacts will be higher on these. In particular Anderson Drive, Tarro (which is a residential area) and Woodbury Road and Adelaide Road which pass through the residential suburbs of Woodbury and Raymond Terrace, will be used as a haulage route for quarry materials, and plant and equipment coming from the north west. Although some heavy vehicle movements need to traverse residential areas, there are no alternatives to these routes which pass through the residential suburbs, and would need to be managed through proactive traffic management measures.

The delivery of this project is proposed to be undertaken in a two-stage process, to provide initial traffic benefits while the Hunter River crossing is constructed.

Issue

Construction traffic impacts are expected, and a limited number of local roads would need to be used by heavy vehicles

Impacts on traffic flows during construction would be limited, as most construction work would occur outside of the existing motorway and highway alignments, however reduced speeds may be imposed throughout the duration of construction around construction sites. At locations where the project interacts with the existing M1 Motorway and New England and Pacific Highways, lane closures are proposed outside of peak hours (7:00 – 9:00 am and 4:00 - 6:00 pm, Mondays to Fridays) and at night (10:00 pm to 7:00 am) to reduce impacts to traffic flows on the wider network.

Construction vehicles will access construction sites and ancillary facilities using both the State and local road network. Total daily heavy vehicles entering and leaving each construction ancillary facility along the alignment is estimated to be between 44 and 364, with vehicle movements during peak hours varying between 5 – 36 in/out movements.

The EIS and RtS undertook an assessment of the performance of key intersections during the AM and PM peaks predicted that there would be no significant decrease in the level of service at key intersections.

Four local roads which pass through residential areas have been identified for use during construction. Woodbury Road and Adelaide Road have been identified as possible haulage routes for quarry materials and plant and equipment coming from the north west during construction, which would increase heavy vehicle movements along these roads. There is no alternative to these routes which pass through the residential suburbs of Woodbury and Raymond Terrace.

Anderson Road would provide direct access to the proposed Tarro interchange works, and construction vehicles from the north west needing to access construction ancillary site AS5 at Tarro (**Figure 18**). Anderson Road passes through the residential areas of Tarro and Beresfield. The Proponent has committed to providing traffic signals at the off-ramp from the New England Highway at the Tarro interchange (linked to Anderson Drive) to improve traffic flows and safety.

Quarter Sessions Road would be used to access AS4 at Tarro. However, the short section of road to be used does not pass through residential areas.

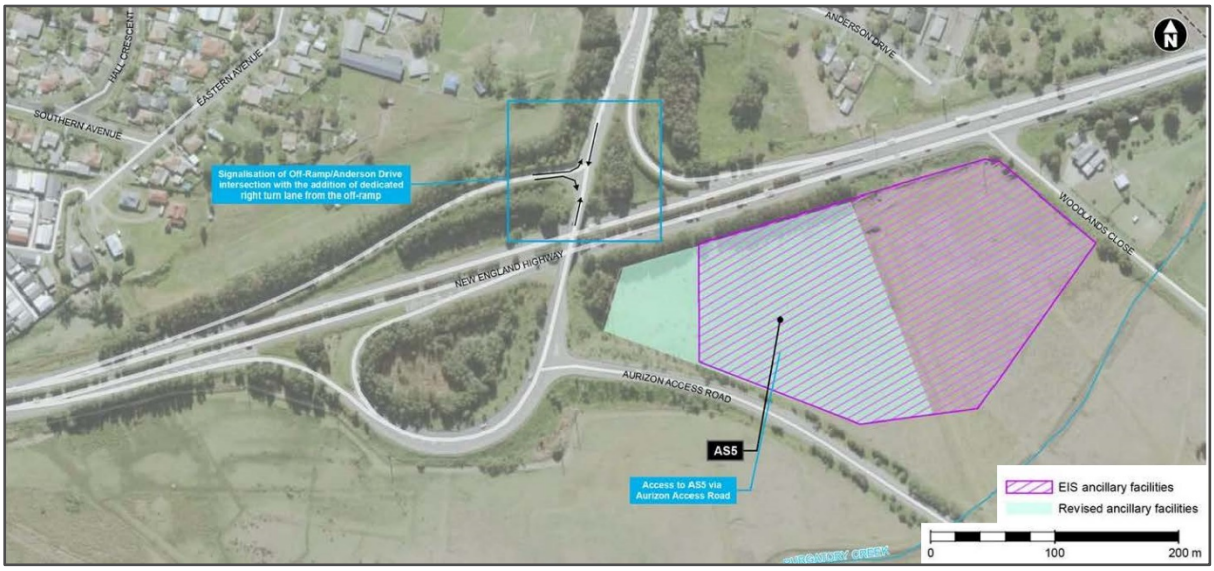


Figure 18 | Revised intersection arrangement at Tarro Interchange (Source: RtS)

There would be a number of lane closures, detours, and temporary traffic management controls implemented during construction, to allow safe construction adjacent to or over live traffic, including lane closures on the New England and Pacific Highways. Road and lane closures would generally occur outside of peak periods or at night when traffic volumes are lower.

The project would provide benefits to the local and regional road network by reducing chokepoints and enabling larger heavy vehicles to cross the Hunter River

The project would provide a motorway connection between Black Hill and Raymond Terrace and bypass the traffic pinch-points at the Hexham Bridge and roundabouts and traffic lights along the

Pacific Highway at Heatherbrae. It will enhance the National Land Transport Network (NLTN) as it is located at a key interchange for traffic travelling north-south between the NSW North Coast and Sydney, and east-west movements between Newcastle and the Hunter and New England regions.

Currently, access to the Pacific Highway southbound is via the heritage listed Hexham Bridge over the Hunter River. The Hexham Bridge is height limited (with a maximum clearance of 5.2 metres), limited in capacity to two undersized lanes, widening at the immediate approach to the Pacific Highway/Maitland Road intersection, and weight limited to 68 tonnes. As a result, the southbound Hexham Bridge cannot be used by heavy vehicles that exceed these weight and height limits. For heavy vehicles to travel south, the northbound bridge is closed to north-flowing traffic and large heavy vehicles travel along the northbound bridge under traffic controlled conditions. The project would alleviate this problem, as the proposed viaduct across the Hunter River will support larger vehicle weights and heights such as PBS Class 2B heavy vehicles.

Further, the project would support the growth and development of employment precincts at Beresfield, Black Hill, Thornton, and Tomago. The Beresfield and Black Hill Precincts are proposed to be freight and logistics hubs, with complementary manufacturing and light industrial activity. All four precincts have the potential to generate significant volumes of heavy vehicle traffic, and construction of the project will facilitate accessibility for freight to these future employment areas.

Significant time savings would be realised for regional traffic, however future development at Black Hill would worsen the intersection performance of Weakleys Drive / the M1 / John Renshaw Drive

The Proponent undertook operational traffic modelling with and without the project for the years 2028, 2038 and 2048, to estimate the current and future levels of travel demand and the impact of the project on the wider road network, including traffic data inputs for the Beresfield and Black Hill Precincts.

The project would benefit traffic flows across the road network, with notable time benefits realised at Hexham and Heatherbrae as through traffic would be separated from local traffic. Significant time saving benefits of up to 38 minutes are predicted in 2048, as shown in **Table 11**.

However, the intersection at Weakleys Drive/M1 Motorway/John Renshaw Drive is expected to continue to have delays due to future industrial development at Black Hill. These delays are expected to be lower in the AM peak (180 seconds versus 124 seconds) and greater in the PM peak (120 seconds versus 151 seconds) in 2038 with the project compared to without the project scenario.

Queuing at the intersection for traffic heading north would extend to the diverge point at the Black Hill interchange, expected to require traffic to slow down before entering the motorway. These impacts to the road network are expected to be generated from future traffic growth and development of the Beresfield and Black Hill Precincts, not attributable to the project. Therefore, management of these impacts is not considered in this assessment report as these matters would be assessed under any future development application(s) associated with the Beresfield and Black Hill Precincts.

Table 11 | Predicted travel time savings in 2028 and 2048

Origin	Destination		2028			2048		
			Base Case (without project)	Project Case (with project)	Travel time savings	Base Case (without project)	Project Case (with project)	Travel time savings
M1 Pacific Motorway (north bound)	Pacific Highway (travelling towards Raymond Terrace)	**AM**	20:35	11:32	***9:03***	55:53	17:41	***38:12***
		PM	21:17	11:32	***9:45***	37:53	19:50	***18:03***
	Maitland Road (travelling towards Newcastle)	**AM**	21:11	16:34	***4:37***	59:07	33:24	***25:43***
		PM	20:26	16:49	***3:37***	44:23	29:22	***15:01***
Pacific Highway (south bound)	M1 Pacific Motorway (travelling towards Sydney)	**AM**	19:05	11:34	***7:31***	31:13	11:40	***19:33***
		PM	21:04	11:29	***9:35***	1:08:50	30:21	***38:29***
	New England Highway (travelling towards Maitland)	**AM**	15:52	10:10	***5:42***	24:03	10:20	***13:43***
		PM	17:58	10:16	***7:42***	1:06:21	30:11	***36:10***
	Maitland Road (travelling towards Newcastle)	**AM**	17:24	14:00	***3:24***	24:35	19:55	***4:40***
		PM	16:07	13:37	***2:30***	1:06:21	30:11	***36:10***
Maitland Road (north bound)	Pacific Highway (travelling towards Raymond Terrace)	**AM**	16:37	13:55	***2:42***	18:03	15:00	***3:03***
		PM	16:21	14:27	***1:54***	47:20	26:43	***29:37***

Submissions

Community and special interest group submissions

Approximately 40 per cent of the community submissions indicated support for the project. Key issues raised in submissions from the community who objected to or provided comments include:

- investigation of the potential to integrate the project with elements of the future Rail Freight Bypass to allow efficiencies in the delivery of construction materials, hence reducing truck congestion on the local road network
- access to properties
- lack of consideration and integration of active transport, including a separated shard pathway along the proposed viaduct

- induced demand from the project would result in new bottlenecks and rat runs through local roads.

In addition, the community requested additional interchanges and on/off ramps including:

- a full interchange at Masonite Road to accommodate traffic to/from Port Stephens, as the proposed design requires exiting on the Tomago Interchange through slow corridors
- connections for traffic to be able to access Heatherbrae from the new alignment, to reduce impacts on business in Heatherbrae
- removal of the proposed on-ramp from the New England Highway to the new alignment at Tarro and the provision of a new on-ramp at Black Hill from Weakleys Drive.

Councils

Port Stephens Council identified an opportunity to classify the local roads Old Punt Road and Masonite Road as State roads, as they would become major access points to the highway. Reclassification would enable the redirection of funds from Council's Infrastructure Contributions Plan used for upkeep of these roads to other works in the area.

City of Newcastle raised concerns that the modelling did not adequately capture traffic generation associated with the emerging Black Hill Precinct, and that the project should provide direct connections into the Black Hill Precinct.

Maitland City Council noted its support for the regional traffic network benefits, but raised concerns over heavy vehicles using local roads to haul materials from quarries in its local government area.

Consideration

Construction traffic impacts are expected but can be managed through standard best practice management and mitigation measures

Most construction vehicles would use existing State roads (including the New England and Pacific Highways) and the M1 Motorway to access construction sites, and therefore not have a significant impact on local roads and traffic. Most access points to and from construction ancillary facilities would be a left in/left out configuration along the main arterial road network, avoiding the need for trucks to cross traffic and cause delays.

AS4 would be accessed via a local road - Quarter Sessions Road, Tarro - and have a direct interface with the adjacent residential area. Access to AS12, AS13, AS17, AS18, AS19 would also be via local roads (Old Punt Road and Masonite Road), however, there are no residences along the sections of road that would be used. The use of Anderson Drive to access AS5 and the Tarro interchange works would impact on local traffic through Tarro. The Proponent has indicated that it would discourage the use of Anderson Drive to access AS5, but it would be needed for deliveries on rare occasions.

To ensure that other local roads are not used by construction heavy vehicles, the Department has included a condition that requires the Department's approval to use any local roads not identified in the EIS or RtS. In addition, the Department has recommended that road dilapidation surveys are undertaken of the local roads that will be used by construction heavy vehicles. If damage to roads occurs as a result of construction heavy vehicle movements, it must be rectified and the road restored

to at least the condition it was in pre-construction. This will ensure that any damage to local roads is repaired by the Proponent and not left for council to repair.

To address any residual issues with construction traffic movements, the Proponent has committed to implementing a Construction Traffic and Transport Management Plan to manage impacts to traffic and transport. The Plan will detail measures undertaken to maintain access, safety and manage construction traffic interfaces. The Department has reinforced this commitment as a recommended condition of approval.

Although existing access to some properties and utilities would be affected during construction, the Proponent will either maintain or provide alternative access to impacted properties and utilities

Issues regarding property access were raised by the community during EIS exhibition. During the construction stage, access to 23 properties would be affected. The Proponent has indicated that access to these properties would be maintained during construction, with some properties requiring an alternate route to be provided, and has committed to developing an alternate access strategy and continuing to engage with landowners to ensure suitable access arrangements are provided, limiting changes property owner access for everyday activities. To reinforce this commitment, a condition has been recommended requiring access to be maintained to properties during construction, unless alternative access is agreed with the affected landowner. In addition, where construction activities restrict property access to the road, temporary alternate access to another road must be provided or as agreed with the landowner. The Department has recommended any property access physically affected by construction of the project must be reinstated to at least an equivalent standard.

Operational benefits would be realised throughout the wider road network

The introduction of the project to the network would significantly improve intersection performance, with delays at major intersections expected to be reduced by up to 195 seconds during peak hours in 2038. As detailed in **Table 11**, there would also be significant travel time improvements for journeys both along the main alignment and journeys across the alignment, due to the movement of traffic off the existing Pacific Highway, New England Highway and John Renshaw Drive.

The Proponent has identified that the project may increase traffic demand by reducing congestion and increasing road capacity to cater future growth in the area. However, it is not possible to quantify this as potential users of the proposed new motorway could come from a broad area. As the motorway will not be tolled and will provide faster, more reliable travel than the alternate local and State road network, the potential for drivers to use residential side streets as a short cut (rat running) will be low.

The project will not fix future traffic impacts associated with the emerging Black Hill Precinct and these issues will require assessment as part of future development applications

City of Newcastle raised concern over the predicted traffic volumes for the Black Hill Precinct used in the traffic modelling, indicating they were low, and requested the project be amended to include alternative access to the future industrial estate at Black Hill Precinct. The Proponent has advised that the latest traffic data and forecasts available for the Precinct were included as part of the projects traffic modelling. In addition, the traffic assessment included sensitivity testing scenarios of the traffic impacts predicted from the Black Hill Precinct. One of the scenarios tested was the performance of the road network if an alternate southern access was provided into the Black Hill Precinct from the project. The results of this testing scenario indicated that the inclusion of on/off ramps from the M1 Motorway into the Black Hill Precinct would reduce queuing and delays around the John Renshaw

Drive/Weakleys Drive intersection. However, the forecast intersection performance would worsen as a result of future development at Black Hill.

The initial 2010 project design included a full interchange at Black Hill. Further options analysis and community engagement was undertaken between 2010 to 2016 resulting in a revised design (current project) comprising a half interchange at Back Hill and a new interchange at Tarro. The rational to having two interchanges is to alleviate traffic congestion at John Renshaw Drive/Weakleys Drive, as this area already experiences high volumes of traffic which will increase as the precinct develops. Rationalisation of the Black Hill interchange would also reduce clearing of high-quality vegetation.

The Department considers future provision of a southern access point to the Black Hill Precinct is outside of the scope of this project, and is a matter for the Proponent, councils (City of Newcastle and Cessnock) and other stakeholders to resolve, as the demand will be driven by precinct development. As noted in **Section 3.4,** the Proponent has undertaken various options analysis and traffic modelling to determine the current project route and preferred interchanges. The Department is satisfied that the proposed interchanges would operate efficiently in the future once the Black Hill Precinct is developed.

Provision of active transport infrastructure along the alignment is limited, however design refinements safeguard future active transport corridors

Currently, there are no dedicated cycle paths within the project corridor, with cyclists using the shoulders of the existing road network, including the Pacific Highway. Several submissions raised concern over the lack of consideration of active transport in the design of the project. The Department notes that the project does not include dedicated cycle paths, but cyclists can continue to use the road shoulders along the proposed motorway. As the project will remove through traffic on the existing Pacific Highway between Tarro and Heatherbrae (onto the new motorway), this provides safer passage for cyclists compared to the current situation, due to the reduction in through traffic volumes in the future.

In the absence of providing dedicated cycling infrastructure, the Proponent proposed several positive changes to the existing cycle network including:

- upgrade of the cyclist crossing at the Weakleys Drive/John Renshaw Drive intersection with connectivity to the motorway shoulders
- upgrade of the existing signalised M1 Pacific Motorway and John Renshaw Drive intersection, to provide a signalised pedestrian crossing across the southern approach to the intersection to facilitate safe crossing for cyclists
- relocating the existing cyclist crossing on the New England Highway, just east of John Renshaw Drive, further west before the northbound entry ramp at the Tarro interchange
- provision of a westbound cyclist crossing on the New England Highway across John Renshaw Drive
- provision for northbound cyclists on the Pacific Highway to access the Hunter Region Botanic Gardens.

The Proponent has identified opportunities to safeguard the route for the future Shortland to Tarro Cycleway, which will form part of the Richmond Vale Trail, by providing an extended and widened

road culvert under the ramp leading to the viaduct at Black Hill/Hexham, and provision for cyclists at traffic signals at the Tomago interchange.

Requests for additional interchanges and on ramps were considered as part of the initial project design prior to the preparation of the EIS, but were discounted due to engineering and trafficability constraints

Community submissions and City of Newcastle requested that additional interchanges and/or on- and off-ramps be provided as part of the project. As noted above, investigations by the Proponent indicated that including an on-ramp to the new motorway to create a full interchange at Black Hill would result in significant congestion and delays, and therefore has not been included.

An interchange at Masonite Road to provide additional access to Port Stephens was not considered feasible, as it would require clearing of sensitive ecological areas including Koala habitat, and impact on the Tomago Sands drinking water catchment and future development planned next to Masonite Road. In addition, suitable access to Port Stephens is already available via Tomago Road / Cabbage Tree Road (south of Masonite Road) and Richardson Road (north of Masonite Road).

Although Heatherbrae will be bypassed by the project, an interchange or on/off-ramps are not essential at Heatherbrae as the town centre is accessed via the Tomago interchange, with the reduction in traffic on the local road network improving access to local and regional customers. Advisory signage will be provided on the approach to the interchange to inform the travelling public about services in Heatherbrae.

Re-classification of Old Punt Road and Masonite Road is a matter for Port Stephens Council and the Proponent

The Proponent has indicated it will consult with Port Stephens Council about the appropriate road classification of Old Punt Road, as the project will result in in an increase in traffic along the road. The Department is satisfied with this commitment. The project will not change the traffic profile or function of Masonite Road, and the Department accepts the Proponent's position that no change to its classification is therefore necessary.

6.2 Noise and Vibration

The project will exceed noise management levels (NML) set out in the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) during construction. Night-time construction noise impacts are unavoidable due to constraints associated with construction activities in active road corridors which require partial or full road closures and that can only be undertaken at night to avoid significant traffic disruptions. These construction activities include interfaces with the existing M1 Pacific Motorway, New England Highway upgrade and the construction of the Tarro interchange, bridge construction work over the Main North Rail Line and existing roads, and Pacific Highway tie-in works (at Tomago, Heatherbrae and Raymond Terrace). To support these activities some construction compounds (including concrete and asphalt batching plants) would need to operate during the night. The Department has recommended conditions to manage impacts associated with out-of-hours works, including coordination of utility management works, active community engagement, provision of respite periods and implementation of at-property architectural noise treatments.

Operation of the project will result in exceedances of operational noise criteria (set out in the *Road Noise Policy* (DECCW, 2011) and *Noise Criteria Guideline* (RMS, 2015)) at 200 residences and 21 other sensitive receivers. Operational noise impacts that exceed the relevant road traffic noise criteria are predicted in areas where the new alignment is closer to residents and other sensitive receivers, and around the new interchange at Tarro.

To reduce operational traffic noise impacts, the Proponent has proposed to install new, and upgrade existing, noise barriers along the New England Highway at Tarro, install a new noise barrier at Tomago, and relocate the existing noise barrier at Black Hill so that it is adjacent to residential areas hence improving its effectiveness in reducing traffic noise at nearby residences. The New England Highway at Tarro will be upgraded with low noise pavement to reduce operational noise impacts to affected residents. At-property architectural noise treatments will be provided at residences and other sensitive receivers where NMLs are exceeded following the implementation of at source (low noise pavement) and barrier treatments. The Department has recommended a review of the effectiveness of the proposed mitigation measures during detailed design and operational noise validations be undertaken within twelve months and at five years after opening.

Issue

Additional construction hours have been sought due to constrained work environments within existing road corridors

The Proponent has sought approval to extend the standard construction hours (7.00 am to 6.00 pm Monday to Friday and 8.00 am to 1.00 pm on Saturdays) to include an additional hour at the start of each Monday to Friday and to work from 7:00 am through to 5:00 pm on a Saturday as shown in **Table 12**. The extended construction hours would apply across the project.

Table 12 | Proponent proposed construction hours (Source: RtS)

Construction hours	Activities
Monday to Friday 6.00 am to 6.00 pm	6.00 am to 7.00 am: construction activities (e.g. toolbox meetings, preparation of equipment, light vehicle movements) that do not result in noise levels above the relevant construction noise management level at the nearest affected residential receiver
	7.00 am to 6.00 pm: general construction activities
Saturdays 7.00 am to 5.00 pm	General construction activities
Sundays and public holidays – N/A	Nil

In addition, some construction activities would need to be carried out during evening (6:00 pm – 10:00 pm, Monday to Sunday) and night time periods (10:00 pm – 7:00 am Monday to Saturday and 10:00 pm – 8:00 am Sundays). These works are referred to as 'out-of-hours works' and would occur where the activities are near or tie into operational roads (such as the New England Highway at Tarro) and the Main Northern Railway Line. This is necessary as any construction during daytime hours would constrain the wider transport network and may be hazardous for construction crews working amidst trains and large traffic volumes. Activities likely to be undertaken of a night time include:

- bridge works, including piling
- utility works including modifications, relocations or protection measures work
- traffic controls and traffic diversions within the existing road corridor(s)
- operation of concrete and asphalt batching plants within ancillary facilities
- resurfacing of pavements, removal of existing lane marking and application of new lane marking
- removal of existing static signage and installation of new signs
- removal of existing traffic barriers and installation of temporary and permanent traffic barriers
- road tie-ins.

By using the extended construction hours and undertaking out-of-hours works, the Proponent considers the project would reduce impacts on residents due to shorter construction timeframes, and reduce impacts to the traffic network during peak hours. However, extended hours would increase the proportion of the day that receivers are affected by construction.

Construction noise and vibration impacts are unavoidable

Noise impacts are expected during construction, particularly from clearing, bridge works, earthworks, activities at construction ancillary facilities and out-of-hours works around existing road and rail corridors, in particular utility, cross-drainage and roadside furniture and finishing works. The highest impacts are generally where residences are located close to the construction footprint.

The highest noise impacts to residents will occur at Tarro (noise catchment are (NCA) 04A – see **Figure 19**) near the proposed Tarro interchange and at Beresfield and Tarro adjacent to the New England Highway. Construction noise impacts greater than 25 dB above the NML (i.e. 'highly intrusive' noise levels) would be experienced at residences during:

- standard construction hours, daytime out-of-hours periods (7:00 am – 8:00 am and 1:00 pm – 5:00 pm on a Saturday) and of an evening (6:00 pm – 10:00 pm) when clearing, grubbing, demolition, utility works and bridge piling are undertaken
- the night-time (10:00 pm to 7:00 am) when utility work, site establishment, non-piling bridge work, roadside furniture and finishing work and cross drainage work are undertaken.

Other residential areas that will experience construction noise impacts (up to 20 dB above NML) from similar construction activities and work schedules include the areas of Tomago (Sweetwater Grove estate), Black Hill and Heatherbrae. However, the assessment indicates the degree of noise impacts aren't as significant compared residents around the Tarro interchange and works along the New England highway, because these areas do not directly adjoin areas of construction.

In addition, asphalt batch plant operations may be required during some night-time periods to provide materials to night-time construction activities. Although the Proponent has identified various potential construction sites to operate asphalt batch plants, some residents in Tarro and Black Hill may be able to hear these operations during the night-time period.

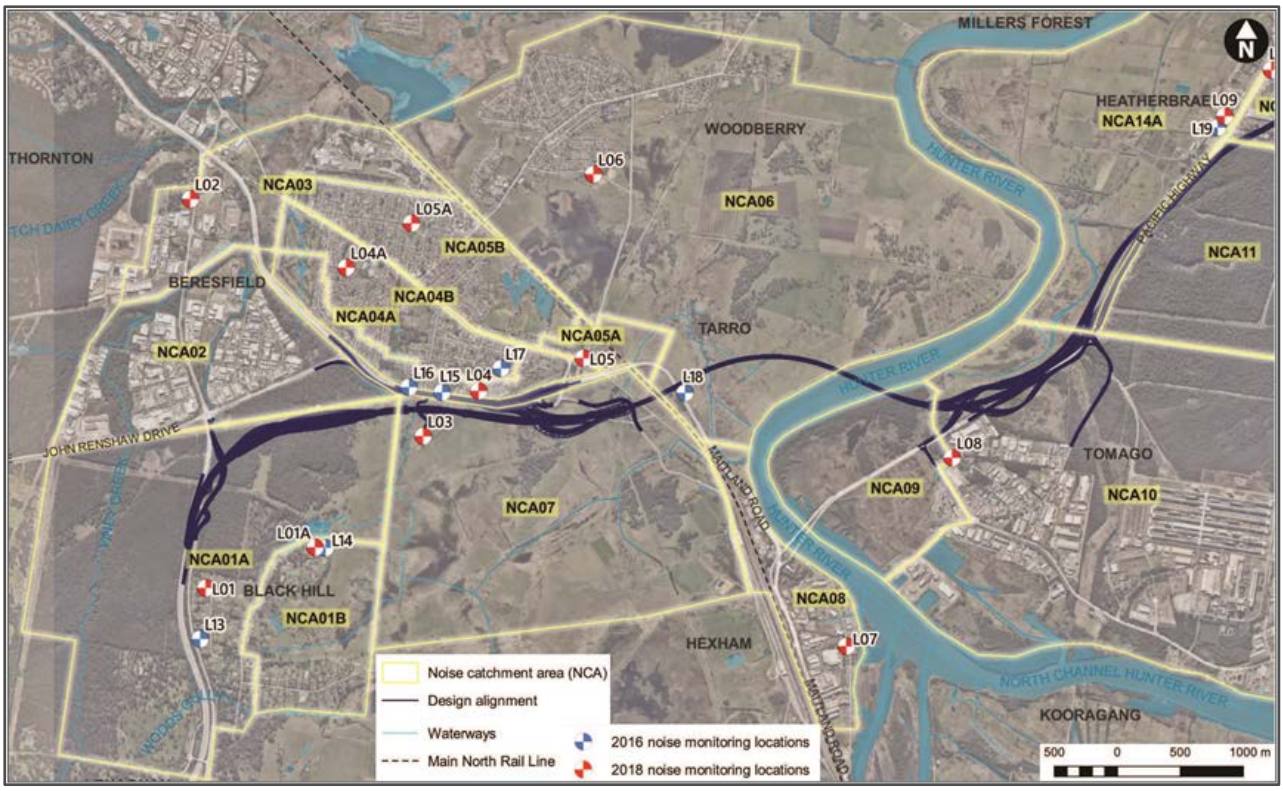


Figure 19 | Noise catchment locations and noise logger monitoring locations (Source: EIS)

Night-time works have the potential to result in sleep disturbance impacts. The Tarro area has the highest number of residences at which the sleep disturbance screening would be exceeded as lane closures of the New England Highway would occur during the night period when there is the least traffic, and utility and interchange works would take place.

Construction traffic is not expected to increase traffic noise levels by more than 2 dB(A) on most routes and is considered barely perceptible. However, increases of up to 5.9 dB(A) during the night-time period were predicted along Masonite Road, Heatherbrae, which supports commercial and industrial premises and therefore no impacts to residents is expected.

Both structural damage and human disturbance vibration may be experienced by residences and residents at Tarro, Hexham, Black Hill and Tomago where vibration generating activities will occur within 90 metres of residences. There is also a low risk of structural damage to industrial, commercial and recreational structures at Tomago and Heatherbrae where construction vibration generating activities occur within 100 metres.

Pile boring to construct bridges and vibratory rollers to lay pavement, may generate vibration at the following heritage items: Glenrowan Homestead (residence) at Black Hill; a residence on Eastern Avenue at Tarro; and the Tarro Substation.

Blasting could generate vibration. If required, blasting would be undertaken in the Black Hill area south of John Renshaw Drive. The need for blasting would be determined during pre-construction and detailed design.

Operation of the project will increase traffic noise levels at Tarro, Beresfield, Tomago and Heatherbrae and require mitigation

Some residents and other sensitive receivers may benefit from reduced traffic noise as the project will bypass these areas. However, operational traffic noise would increase in some locations. Two hundred residences and 21 other sensitive receiver buildings (four places of worship and two schools – Tarro Public School and Our Lady of Lourdes Primary School at Tarro) are expected to experience noise levels above the noise criteria if not mitigated. These are concentrated at Tarro, Beresfield, Tomago (Sweetwater Grove development), Black Hill and Heatherbrae, where traffic will be closer to residences compared to the current situation.

Proposed mitigation to reduce noise include low noise pavement, noise barriers and at-property architectural noise treatments. The implementation of noise barriers and low noise pavement would reduce the number of noise-affected residences from 200 to 171 but would not provide relief for other sensitive receivers. This means that a total of 192 sensitive receivers (including the places of worship and schools) are considered eligible for at-property architectural noise treatment.

Submissions

Community and special interest group submissions

Issues raised include:

- benefits of the project for receivers near the highway as traffic would be further away from receivers
- the EIS did not consider heavy vehicle noise
- impacts to receivers at Black Hill as motorway corridor is brought closer to receivers
- requested the replacement of wooden noise barriers with concrete barriers along the eastern boundary of the motorway between Lenaghans Drive turnoff to the Black Hill overpass to reduce impacts to receivers at Black Hill
- adequacy of existing noise barriers in reducing traffic noise levels at residences
- traffic noise to and from the Black Hill Industrial Precinct.

Councils

City of Newcastle raised the following issues:

- noise and vibration impacts on heritage listed items and the eligibility of heritage items for at-property architectural noise treatment.

Agency advice

The **EPA** raised the following matters:

- noise monitoring: requested further information and justification over location, method and amount of valid data collected to determine background noise monitoring to be used to determine construction noise management levels and operational traffic noise criteria
- extended construction working hours: a lack of justification for the requested extended construction hours and out-of-hours work

- management and mitigation: limited detail on the proposed construction mitigation measures, including community engagement on the measures
- management and mitigation: a need to clarify the location, type and effectiveness of mitigation measures in reducing maximum operational noise levels

Consideration

Standard construction hours have been adjusted to include Saturday afternoons to provide flexibility to work scheduling

The Proponent has sought approval to extend the standard construction hours on a Saturday of 8.00 am to 1.00 pm up until 5:00 pm. The additional four hours would provide flexibility in moving forward some construction activities which otherwise would be undertaken of an evening or night time on weekdays. The extended hours would benefit the community by reducing the need for out-of-hours works. The Department considers that construction on Saturday afternoons is acceptable and reflective of changing work/business behaviours and has recommended the extension in hours and that the Proponent has provided sufficient justification for the extended hours.

Approval has also been sought for construction hours to be extended and commence at 6.00 am on weekdays (rather than 7:00 am) and at 7.00 am Saturdays (rather than 8:00 am). Construction activities that would occur include toolbox meetings and preparation of equipment. The Department does not consider it reasonable to further extend construction hours where construction activities would be close to residences and where out-of-hours works programs are already proposed such as Black Hill, Tarro and Raymond Terrace. In addition, the ICNG (DECC, 2009) allows for extended construction hours subject to activities not generating noise more than 5 dB(A) above the rating background level. The EPA's licencing also allows for construction to be undertaken outside of standard construction hours where there is a low to negligible impact to receivers. If construction hours were to be extended to 6:00 am on a week day and 7:00am on a Saturday, the construction contractor could elect to undertake high noise impact activities during those times, which would impact the community's amenity. Taking into consideration all of these issues, the Department has not recommended that construction be allowed to commence an hour earlier than the standard construction hours.

Noise from out-of-hours construction would be managed by active community engagement, respite periods and at-property noise mitigation

Most construction activities are expected to be undertaken during daytime hours however, out-of-hours work would be required. The noise generated by out-of-hours work could impact on the health and wellbeing of receivers and cause sleep disturbance. For example, noise levels of greater than 25 dB above NMLs are predicted to occur at residences in NCA 04A (Tarro and Beresfield) of a night time during utility works, bridge works (non-piling) and roadside furniture and finishing work.

Impacts of night-time work would be greatest at residential locations around Tarro, then at Black Hill, Tomago (Sweetwater Grove estate), and Heatherbrae. Some work needs to be completed outside of standard hours due to operational and safety constraints associated with working on main roads amidst live traffic and live rail operations. To manage noise impacts associated with out-of-hours work, the Proponent has committed to scheduling (where possible) high noise impact work to evening periods (finishing by 10:00 pm), using alternative plant and equipment that are less noisy, notifying the community of the works, erecting temporary noise barriers, and providing respite. In addition,

regular community information sessions will be held for affected residents around the Tarro interchange where night-time noise impacts would be highest.

Much out-of-hours work would be regulated through an EPL. However, for work which is not, a proactive approach to the management and mitigation of noise impacts is required. As such, the Department has recommended the preparation and implementation of an Out-Of-Hours Work Protocol which sets out the process for the approval and management of out-of-hours work, regular consultation with affected residents, respite periods and provision for temporary accommodation (where applicable) for activities that are not covered by an EPL.

As some residents would be exposed to prolonged NML exceedances during the day, evening and night-time periods the Proponent has committed to installing operational noise treatments such as noise barriers and at-property architectural noise treatments (where they are eligible for operational noise treatment). as early as possible to provide noise mitigation benefits to these residences during construction. The Department supports this approach and has reinforced this commitment in the recommended conditions by requiring installation of at-property architectural noise treatments at eligible residences within 12 months of the commencement of construction. Where this is not possible, temporary acoustic treatments must be installed within six months of commencing construction.

Batching plants cannot be established at construction ancillary facility AS4 in Tarro due to night-time noise impacts to residents

Asphalt and concrete required for construction would be sourced from local suppliers. However, the Proponent recognises existing suppliers may be unable to meet the high production rates required. For contingency, one or more on-site asphalt and concrete batching plants would be required. These would be located at seven construction ancillary facilities as identified in **Table 3**.

The concrete and asphalt batching operations at construction ancillary facility AS7 and asphalt batch operations at AS3 would be ‘clearly audible’ (5-15 dB above NML) of a night time in NCA 05 (Tarro). and NCA 07 (Black Hill). Unlike AS3 and AS7, construction ancillary facility AS4 will be located directly adjacent to a large number of residents at Tarro and any batching activities would have significant noise impacts, especially of a night. To safeguard residents from additional construction noise, the Department has recommended a condition that prevents the establishment and operation of batching plants at AS4.

Construction vibration impacts on heritage listed items can be minimised and managed

Three non-Aboriginal heritage items are located within 100 metres of the construction footprint and their archaeological significance is detailed in **Table 13**. Vibration could result in structural damage to the fabric of the items. To minimise potential damage from vibration generating activities during construction, the Proponent has committed to undertaking further investigations during detailed design to confirm their structural integrity (i.e. structurally sound or unsound). In addition, the Department has recommended vibration testing before undertaking vibration-generating activities that have the potential to impact the items, and use this information to identify minimum working distances and the types of vibration generating equipment that can be used so that cosmetic damage does not occur. Vibration monitoring must also be undertaken and where this shows exceedances of vibration criteria, the Proponent must review the construction methodology and implement additional mitigation measures if required.

Table 13 | Heritage items potentially impacted by vibration intensive work (Source: EIS)

Heritage Item	Archaeological Significance	Location	Approximate distance to vibration intensive work*
Glenrowan Homestead (residence)	Potential	51 New England Highway, Black Hill	85 metres
Residence (I548)	Local	29 Eastern Avenue, Tarro	75 metres
Tarro Substation (I546)	Local	6A Anderson Drive, Tarro	100 metres

***Note**: *distances presented represent distance to construction work areas where vibration intensive plant and equipment would be operating*

Blasting hours will be restricted and blasting managed through implementation of a Blast Management Strategy

Controlled rock blasting may be used at the large cutting at Black Hill. If required, blasting would likely impact receivers within Black Hill (NCA 01A and NCA 01B), Beresfield (NCA 02) and Tarro (NCA 04A and NCA 07).

Blasting locations would be identified and trials would be carried out to determine site specific blast response characteristics and define allowable blast sizes. Safety measures identifying safe blast distances and exclusion zones for the travelling and general public would be developed. The Proponent has committed to preparing a Blast Management Strategy before blasting commences to document the approach to managing blasting which would include the identified safety measures. This commitment has been reinforced in the recommended conditions of approval which also restrict blasting to 9:00 am to 5:00 pm Monday to Friday and 9:00 am to 1:00 pm on Saturdays to avoid potential noise and vibration impacts of an evening and night-time.

Operational noise impacts would be mitigated with a combination of noise walls, low noise pavement and at-property architectural noise treatments

During operation, some residents and other sensitive receivers will benefit from the project as the alignment moves the main traffic flow further away. However, traffic noise impacts are expected to increase where the road corridor is moved closer to residences, where on/off-ramps are introduced and where heavy vehicles accelerate or decelerate (particularly around Tarro interchange). It is predicted that operational traffic noise would exceed the applicable traffic noise criteria set out in the *Road Noise Policy* (DECCW, 2011) and *Noise Criteria Guideline* (RMS, 2015) at 200 residences and 21 other sensitive receivers mainly at Tarro, Black Hill, Heatherbrae, Tomago and Beresfield. To manage the impact, a combination of noise barriers, low noise pavement and at-property architectural noise treatments are proposed. These measures are standard practice measures to aid in mitigation for traffic noise.

The existing noise wall on the southbound carriageway at Black Hill, will be relocated and extended to about 490 metres long due to extension of the southbound entry ramp merge lane (refer **Figure 20**). However, eight residences will still experience traffic noise at levels that exceed the operational noise criteria and will be eligible for at-property architectural noise treatments (refer **Figure 20**).

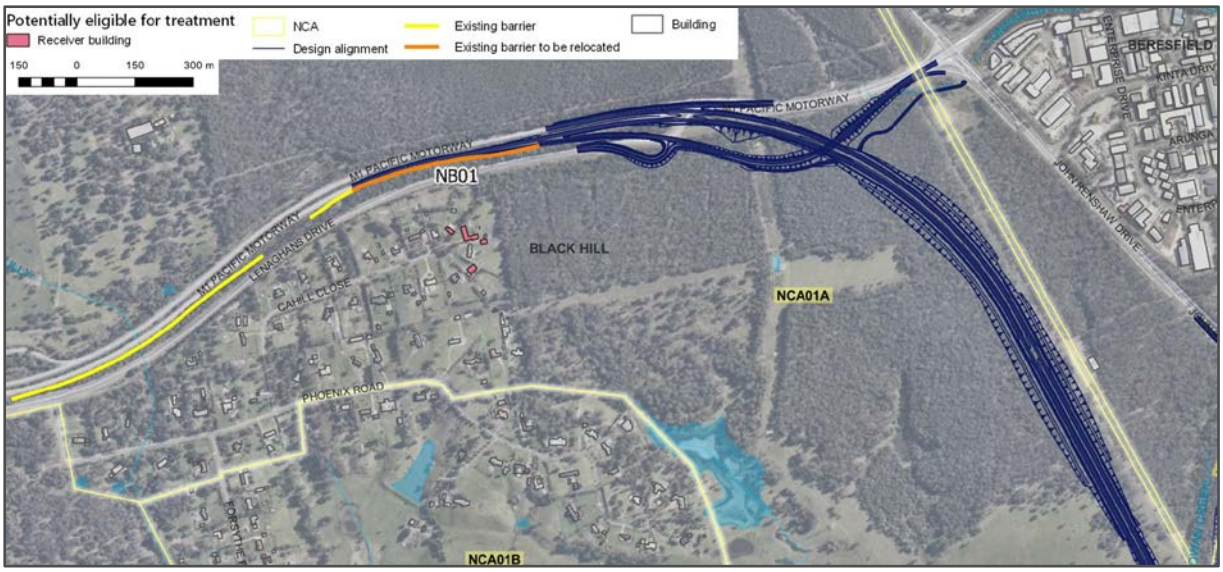


Figure 20 | Proposed relocated noise barrier in Black Hill for southbound entry ramp extension (Source: RtS)

New and upgraded noise barriers would be installed along the New England Highway, including an extension of the existing noise barrier (NB02) to between Pasadena Crescent and the Pasadena Soccer Fields at Beresfield and construction of a new barrier (NB03) from Aldwick Close to the Anderson Drive entry ramp at Tarro (refer **Figure 21**).

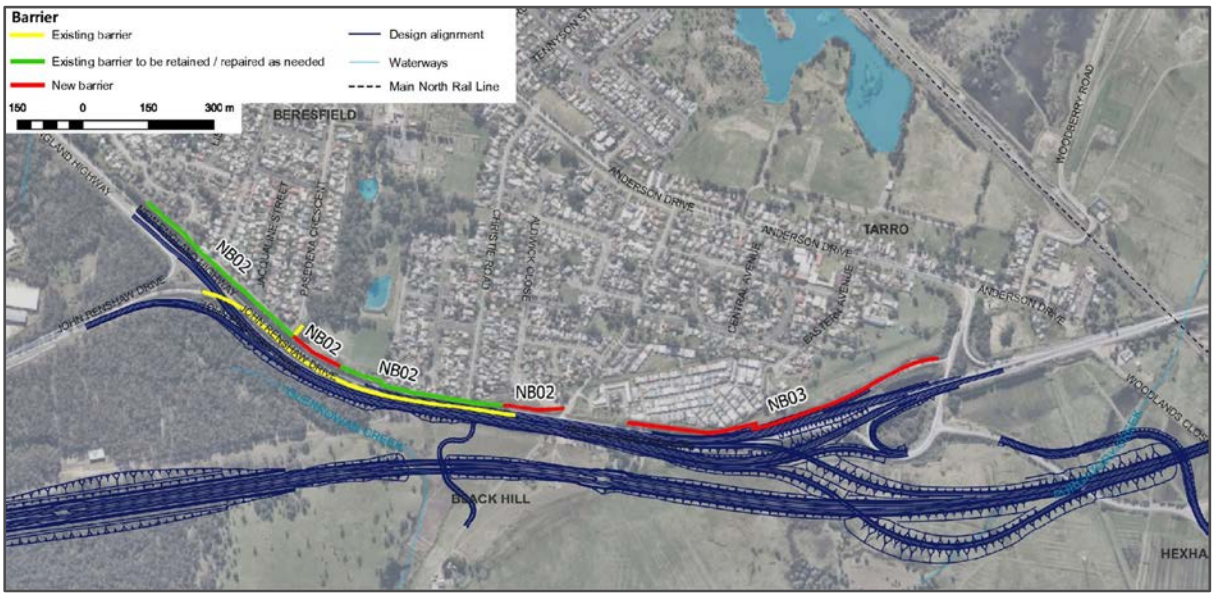


Figure 21 | Existing and proposed noise barriers in Tarro (Source: RtS)

Operational traffic will result in noise impacts above the recommended noise criteria at 24 residences in the Sweetwater Grove development in Tomago following the provision of low noise concrete pavement. A noise barrier analysis indicated that a noise barrier would not be a reasonable mitigation option as it would not provide acoustic benefits to impacted residents.

Although low noise pavement and noise barriers will be provided along certain sections of the project, approximately 171 residences and 21 other sensitive receivers would still exceed operational traffic noise trigger values and would be offered at-property architectural noise treatments.

Additional monitoring locations are required to refine background noise levels and facilitate operational noise review and operational noise mitigation

The monitoring locations and data collected for the noise assessment were not optimal for determining background noise levels in some locations or predicting future noise impacts, especially noise generated by the acceleration and deceleration of heavy vehicles at interchanges. As shown in **Figure 19**, noise loggers NL4, NL15 and NL16 cover NCA 04A (Tarro). The noise data from NL4, NL15 and NL16 is representative of traffic noise from the New England Highway at residents located behind existing noise barriers and therefore can be used for predicting noise at residences which will be located behind new and upgraded barriers along the New England Highway. However, other residents, such as those at Eastern Ave, Tarro are not and will not be behind barriers and will be directly exposed to traffic noise from the new Tarro interchange (see **Figure 22** and **Figure 23**). Further the residents at Eastern Ave, Tarro may also experience different noise impacts than other residents that are shielded or do not have a direct line of sight to on and off ramps.

Figure 22 | Pre-construction - Eastern Ave view towards the Tarro Interchange (Source: EIS)

Figure 23 | Post-construction- Eastern Ave view towards the Tarro Interchange (Source: EIS)

Therefore, the monitoring data from NL4, NL15 and NL16 is not considered to be representative of the existing background noise levels at this location and cannot be used to predict future noise impacts. Additional monitoring is required in the vicinity of Eastern Ave as well as Southern Ave, Northern Crescent and Anderson Ave, Tarro to confirm background noise levels as these areas are not located behind noise barriers nor will they be once the project is operational. As such, a condition has been recommended requiring additional traffic noise monitoring before construction commences. Additional monitoring locations must be located to cover the range of traffic noise conditions along the length of the project corridor. This will enable a better understanding of the existing background levels and the change in noise levels once the project is operational.

The development of a carefully designed monitoring program is an important step in confirming existing noise levels, which in turn is used to assess future operational noise and those residents and other sensitive receivers that qualify for noise mitigation. The predicted noise levels will determine the type of at-property architectural noise treatment which will be implemented.

Once the project is open to traffic, noise monitoring would need to occur within 12 months and at five years to validate operational noise performance and whether additional noise mitigation measures are required.

6.3 Flooding

Flooding

The project is located in the lower portion of the Hunter River catchment. The catchment area is comprised of a range of land uses including agricultural, industrial, commercial, residential and environmental conservation (wetlands and national parks). The Hunter River Floodplain is a sensitive catchment and any new development, structures or landforms will impact on hydrology and flooding. The proposed viaduct and bridge over the Hunter River will have an influence on existing flooding within the Hunter River floodplain. The viaduct piers on the floodplain will hinder flood flows and reduce flood plain storage, and increasing existing flood levels upstream of the project for all flood events up to and including the 1% annual exceedance probability by between 0.01 to 0.02 metres in (1% AEP - i.e. a flood of a size that has a 1 in 100 chance of occurring in any one year).

The Department engaged Bewsher Consulting to undertake an independent and expert peer review of the flooding assessment (**Appendix H**).

Based on the Department's review, and advice from the independent flood expert, quantitative design limits (QDLs) aimed at minimising flood impacts have been developed. The Proponent has committed to undertake further flood modelling during detailed design to refine and verify the extent of flood impacts; and ensure that the project meets the recommended QDLs. Where QDLs cannot be met, mitigation measures will need to be implemented with the agreement of the impacted landowner.

Issue

The RtS included updated flood modelling against more stringent quantitative design limits to determine the Projects flood impacts

The Proponent developed QDLs to guide the design of the project as described in the EIS. The QDLs set out increases in flood levels, velocities and durations for residential, commercial, recreational and

agricultural areas that the project would be designed to. Impacted buildings were identified based on afflux at a building exceeding 50 mm in any flood events up to and including the 1% AEP flood event. The 50 mm afflux threshold related to buildings with above habitable floor flooding i.e. where floors are currently inundated or where the 50 mm afflux would result in habitable floors that were not previously inundated being flooded.

Neither the Department nor its independent flood expert supported the QDLs as set out in the EIS as it is unreasonable to allow inundation of habitable floor levels which are currently not inundated or allow an increase of up to 50 mm afflux to residential and commercial areas where there is above floor flooding. Based on the QDLs in the EIS, there would only be 17 lots newly affected in the 1% AEP flood event, with only 10 lots and one habitable building identified as experiencing afflux levels exceeding the adopted criteria.

The QDLs are also inconsistent with recent linear infrastructure approvals (such as the M12 Motorway and Inland Rail - Narrabri to North Star Phase 1) which allow only a 10 mm afflux for habitable floors for all events up to and including the 1%AEP. This allowance is to provide for modelling margins of error. The expectation is that there is no new or additional flooding above habitable floor levels. Further, the proposed QDLs for increased flooding on urban and residential properties were double the afflux levels approved for recent linear infrastructure approvals.

Consequently, the Department required the project to be modelled against more stringent afflux design limits for above floor flooding and flooding of urban and residential property, consistent with other infrastructure approvals. This was reported in the RtS. **Table 14** shows the differences in the flooding afflux criteria between the EIS and RtS.

Table 14 | Comparison of flood afflux criteria applied – EIS and RtS (source: RtS)

Parameter	Location or land use	EIS	RtS
Afflux i.e. increase in flood level resulting from implementation of the project	Above floor flooding of habitable floors	50 mm	10 mm
	Other urban and residential property	100 mm	50 mm

Remodelling using the revised limits was supplemented with additional building floor level data from City of Newcastle and Port Stephens Council to more accurately determine flooding impacts to residences in those local government areas. Additional building floor surveys were also undertaken or otherwise estimated by the Proponent, mainly in the Maitland City Council LGA.

The project will result in increased flood levels across the Hunter River floodplain

The Hunter River Floodplain is a sensitive catchment and any new development, structures or landforms will impact flooding. The project area and surrounding region has a history of periodic and significant flooding. The existing 1% AEP flood extent is wide and is shown in **Figure 24**.

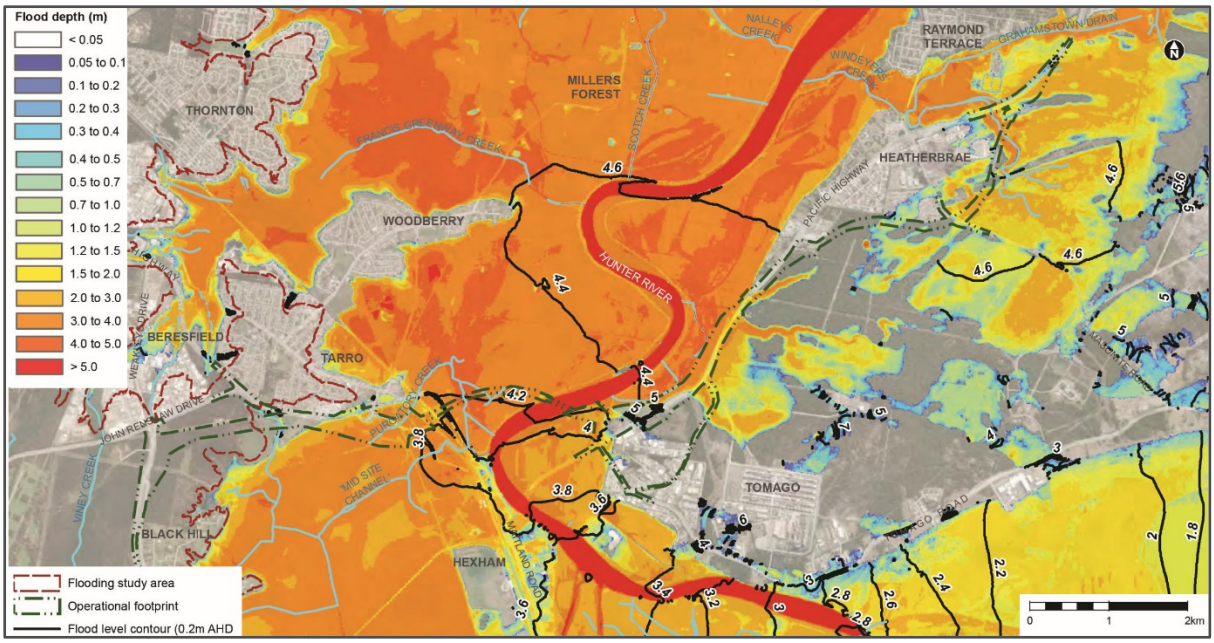


Figure 24 | Flood level and depth - Existing - 1% AEP (Source: EIS)

Table 15 presents the existing flood depths experienced within the floodplain including the probable maximum flood (PMF).

Table 15 | Existing peak flood depths (Source: EIS)

Key part of study area	Sub-sections of the study area	Peak flood depths (metres)			
		20% AEP	5% AEP	1% AEP	PMF
Hexham Swamp	Hexham Swamp	0.5-1.0	1.0-3.0	3.0-4.0	>7.0
	Urban areas	1.5	1.5	1.8	Not known
Hunter River floodplain upstream of the project	Rural and environmental conservation areas	0.3-0.5	2.0-2.5	3.0-4.5	7.0-8.0
	Urban areas – Raymond Terrace	0.5	1.0-1.5	2.0-3.0	Not known
	Minor waterways	0.5-2.0	1.5-2.5	2.0-4.0	
Hunter River floodplain downstream of the project	Hunter River floodplain	0.5-1.0	1.0-1.5	1.5-3.0	5.0-7.0
	Commercial and industrial – Tomago	0.2-0.4	0.2-0.4	0.2-0.4	Not known
	Commercial and industrial – Hexham and Sandgate	Not known	Not known	0.5-2.0	Not known

The updated flooding assessment indicates that flood impacts during construction and operation of the project would be minor with afflux levels increasing up to 0.03 metres during construction and up to 0.02 metres during operation across most of the study area. Identified impacts to residential buildings during construction include:

- 62 residential buildings with existing above floor flooding and afflux exceeding 0.01 metres
- three individual residential buildings with new above floor flooding
- 25 individual residential buildings with existing above floor flooding with a change in duration of inundation of above floor flooding greater than one hour.

Identified impacts to residential buildings during operation include:

- 134 residential buildings with existing above floor flooding and afflux exceeding 0.01 metres in the 1% AEP event
- one residential building with new above floor flooding in the 1% AEP event
- six residential buildings with existing above floor flooding with a change in duration of above floor flooding greater than one hour in the 1%, 5% and 10% AEP flood events.

The number of impacted residential buildings is significantly higher than was identified in the EIS due to the less stringent QDLs that were applied.

Both the EIS and RtS identified, there would be impacts to a 900 metre section of the Main North Rail Line during construction due to the establishment of construction ancillary facility AS6 requiring filling of the site which would reduce floodplain storage.

The project will impact on the levees of the Hunter Valley Flood Mitigation Scheme

The Hunter Valley Flood Mitigation Scheme was established by the NSW Government following the 1955 flood event in the valley. The scheme includes approximately 160 kilometres of levees, 3.8 kilometres of spillways, 40 kilometres of control banks, 245 floodgates and 120 kilometres of drainage canals. It provides flood protection to people, property and infrastructure across the Hunter floodplain. While the scheme does not provide complete flood protection, it is designed to mitigate or reduce flood damage and provide minor flood protection for rural land and moderate flood protection for the Maitland, Lorn, Raymond Terrace, Singleton and Aberdeen areas. Components of the scheme in the vicinity of the project are shown in **Figure 25**.

The project would impact on the Hunter Valley Flood Mitigation Scheme through the construction of access roads immediately adjacent to the existing flood levees on the western Hunter River floodplain or by the location of bridge piers on or near the levees. While these roads may modify the structure and maintenance of the levees, they are not expected to impact operation, function or structural integrity of the scheme (including the floodgates). However, they will take up floodplain storage and result in increases in flood levels. Also, some of the viaduct piers may be placed directly on the levee. The piers may cause scouring doing flooding events.

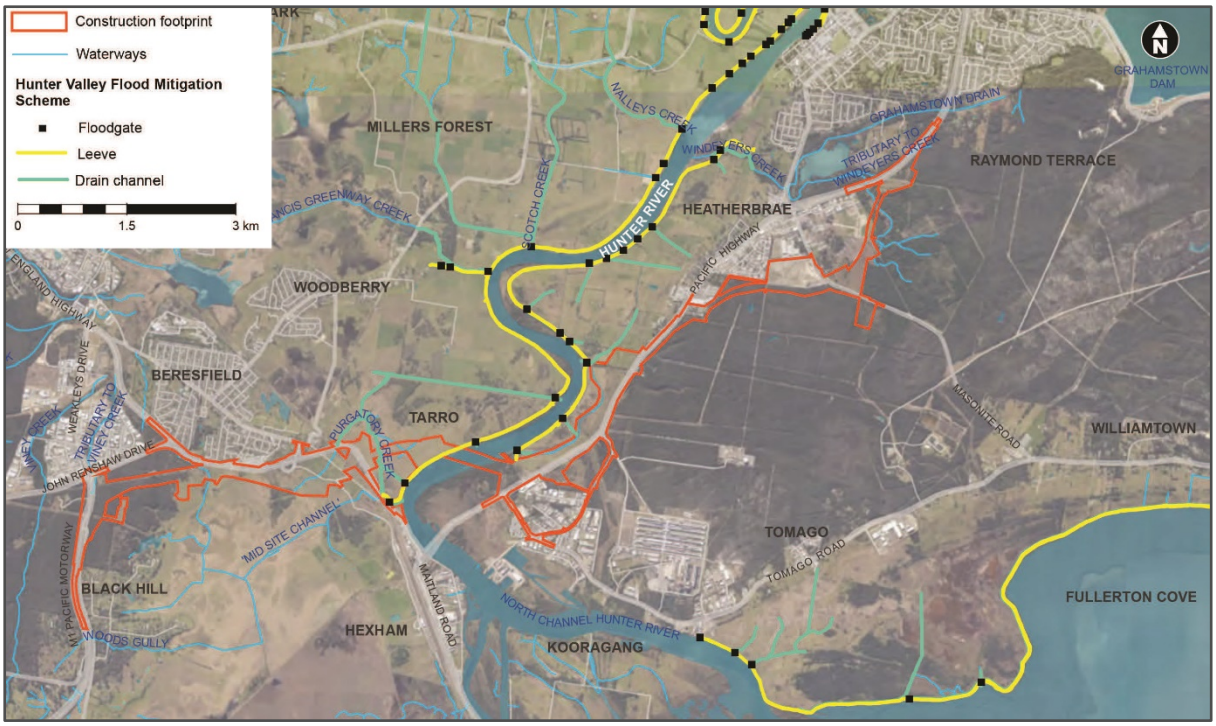


Figure 25 | Hunter Valley Flood Mitigation Scheme (Source: EIS)

Submissions and advice

Community and special interest groups

Issues raised in community submissions included:

- concern that the project will increase flooding impacts (afflux) on adjoining properties and increase the duration of flood events
- increased inundation on Aurizon's landholdings and a request to review the flooding modelling and data to better understand impacts
- the need to design the project to provide flood free access, noting that some parts of the carriageway and connecting ramps may be inundated in a 1% AEP flood event.

Council

Maitland City Council noted that the flood study does not consider the potential impacts of sea level rise, particularly upstream of the new Hunter River bridge.

City of Newcastle provided the following comments / requests:

- further information on flooding impacts on residential and commercial properties and clarification on how the afflux parameters were determined
- whether flood mitigation measures can be effectively implemented at properties impacted by an increased flooding risk and what these management measures would be.

Government agencies advice

EHG (BCD) raised the following matters:

- estimates of climate change impacts may be overly conservative and adopting a reduced rainfall intensity may be more appropriate
- insufficient information has been provided to assess the flood impact methodology and a detailed description is required of the impacts and how these impacts will be mitigated
- the hydraulic model grid is too coarse to assess flood impacts in urbanised areas.

EHG (BCD) also provided recommendations and additional requirements that would address its concerns.

Consideration

The project has been designed and refined to reduce overall flooding impacts during construction and operation

Design of the project commenced in 2004 and since that time has undergone various redesigns and refinements to reduce potential environmental and social impacts, including flood impacts. This has included investigations of alternative alignments. Most significantly, it has involved the replacement of a proposed embankment across the Hunter River floodplain with a 2.6 kilometre long viaduct.

Although the viaduct will significantly reduce flood impacts compared to the embankment design, it will still result in changes to flooding behaviour (i.e. afflux, increased duration of inundation and flood risk). Factors that contribute to these changes include:

- the location of the viaduct abutments
- bridge design alignment, span and pier shape
- operational maintenance facilities such as access tracks to maintain the viaduct
- temporary construction access roads, ancillary facilities and wharfs.

The Department acknowledges that any further refinements to the viaduct design are not likely to provide significant benefit in terms of further decreasing flood impacts, but would incur a significant cost or have other environmental impacts. For example extending the length of the viaduct would require additional land clearing with consequent biodiversity impacts and also require additional land acquisition.

In order to reduce flood impacts and meet the revised QLDs, the Proponent has modified elements of the project design following the EIS exhibition, including reductions in the construction footprint of ancillary facilities in Tarro and reducing the height of construction access tracks, some of which would be retained and used for operational maintenance.

The operational maintenance access tracks between the New England Highway on the western side of the Hunter River and the proposed Tomago Interchange on the eastern side of the Hunter River have been lowered by 0.3 to 0.9 metres. In addition, an access track which was up to one metre above existing ground levels and situated on the eastern bank of the Hunter River at the viaduct construction site was removed. These changes have resulted in minor reductions of afflux levels which is supported by the Department.

In regards to potential impacts on Aurizon's landholdings, refinements to the project design have resulted in flood impacts being below the recommended QDLs for the project. In addition, the Proponent has committed to consult with Aurizon on potential flood impacts.

Flooding impacts during construction can be managed through ancillary facility site placement

Seven of the 22 proposed ancillary facilities sites are located within potential flood hazard areas (i.e. within the 5% AEP flood extent). Due to the scale of existing flooding around the construction footprint, all ancillary sites have been placed in areas where only parts of the ancillary facilities are predicted to be impacted by flooding. To manage residual flooding impacts, stockpiling and plant machinery would be placed outside the flood hazard area.

The rate at which water levels rise and overtop the banks and levees of the Hunter River is such that sufficient warning of a potential flood event can be given to persons and businesses within the floodplain (the Bureau of Meteorology has a target warning lead time of 18 hours for a major flood (over 3.5 metres) and six hours for minor floods (2.5 metres). As such, the Proponent will have adequate time to move plant and equipment and secure construction sites and ancillary facility sites and make sure that plant and equipment do not become flood debris and pose a hazard.

Redesign of construction ancillary facility AS6 is required to reduce construction-related flooding impacts to the Main North Rail Line

There is a 900 metre section of the Main North Rail Line in Tarro which would be subject to up to a 0.14 m increase in flood level in the 5% AEP event during construction. This is attributed to the configuration of ancillary site AS6 located between the Highway and the Main North Rail Line. This section of the line is currently subject to flood depths of over one metre in the existing 5% AEP, hence the increase in flood level will have no material impact to trafficability of the railway at this location. However, there will be a minor incremental extension of the length of railway already affected under existing floods. As such, the Proponent is required to redesign the location, size and height of AS6 to minimise potential short-term impacts to the Main North Rail Line during the construction period. The RtS assessment hasn't identified any additional flooding impacts to the Main North Rail Line during operation. Although ARTC provided input into the SEARs and revised SEARS, no comments were provided during the EIS exhibition process.

Quantitative design limits have been recommended to guide the detailed design of the project and ensure appropriate mitigation is provided

The Department has recommended QDLs to minimise impacts on flooding in areas outside of the project boundary during flood events. The QDLs include maximum increases in flood levels in above-floor inundation and within various land use zones including residential, industrial, commercial and rural lands. Although the Proponent has refined the design to limit flood impacts to the greatest extent practicable, increases in flood afflux cannot be avoided due to the hydrodynamics of the floodplain. Consequently, the Department has recommended a condition which provides for the Proponent to consult and agree with affected landholders on mitigation measures where the QDLs cannot be achieved.

In many instances, the increase in the level of flood inundation would be small compared to the existing flood levels that would be experienced without the project. As such, the increased flood levels would not have a significant material impact beyond that which is already experienced during periods of flood.

An Independent Flood Impact Advisory Panel has been recommended to aid in dispute resolution on the type of mitigation measures provided to offset flood impacts on individuals

The Department recognises that a landowner affected by flooding at levels that exceed the QDLs may not be able to reach agreement with the Proponent on the measures to be implemented to mitigate the flood impacts. To facilitate resolution, the Department has recommended the establishment of an Independent Flood Impact Advisory Panel comprising independent mediation, hydrology, engineering and agriculture experts. The Panel's responsibilities will include:

- investigating landowner concerns
- considering whether reasonable and practical steps have been taken to mitigate flood impacts
- preparing a report which contains reasonable recommendations about practicable design changes and/or mitigation and management measures to resolve material flooding impacts to both the landowner and Proponent.

Where the Proponent does not implement a particular recommendation(s) the Proponent must justify why the recommendation(s) is not being implemented and this justification must be made publicly available.

The Department considers that the Panel process will be an effective means of handling any disputes relating to flooding impacts as the Panel will provide its own professional opinion on the final measures that need to be implemented, and whether what is being proposed by the Proponent is feasible and reasonable.

Further modelling and property surveys will be required to confirm the properties that will experience increased above floor level flooding as a result of the project

Although additional survey and modelling was undertaken post exhibition of the EIS, the Department's independent flood expert recommended additional modelling post approval as flood levels at the upstream boundaries of the hydraulic model were predicted to be between 15 mm - 20 mm. This is above the Department's recommended 10 mm afflux level for above-floor inundation of habitable rooms where floor levels are currently inundated. The Department accepts and concurs with the concerns raised in the peer reviewing that there could be properties outside the current model boundary that may be impacted and as such, the model needs to be extended until there's an afflux of 0 mm – 10 mm at the boundary. This will ensure that all potentially impacted properties are identified.

Flood floor surveys will be required of all properties where the QDLs are exceeded and where survey data cannot be sourced from councils. This would ground truth the modelling and confirm whether the QDLs will be exceeded. The Department considers this verification process is a key element in understanding the extent of impacts as there may be properties that have been identified as being impacted by the project but are actually built above the 1% AEP flood event level.

The Proponent has agreed to extend the model boundary upstream along the Paterson and Williams rivers. This approach is supported by both the Department and its independent flood expert. The Department has recommended that the Proponent's flood model be updated to include the Paterson and Williams Rivers and the results from the additional modelling be reviewed and endorsed by an independent and suitably qualified and experienced hydrologist.

Once all the data collection and remodelling are completed, the flood information must be made available to councils, if requested. This will ensure that they have the most up-to-date data for assessing future developments within the floodplain.

In regard to EHG's (BCD) concerns on the hydraulic model grid mesh, a finer grid scale will be applied during more detailed assessments and modelling around Tarro during the post approval remodelling process. The finer mesh scale will allow smaller scale features to be represented at a finer resolution giving improved predictions of flood propagation. The Department is satisfied with the Proponent's response regarding ocean tide effect on flood levels and how it has been built into the modelling process.

The main carriageway has been designed to provide a flood immunity of 5 % AEP and therefore will not provide flood-free access during all flood events

The design objective for the project is a 5 % AEP flood immunity from Hunter River flooding for the main carriageway of the motorway, with the underside of all bridges above the 1 % AEP flood plus a 0.5 metre freeboard. The Proponent has indicated that it is not an objective of the project to make the proposed motorway flood-free for all flood events up to the Probable Maximum Flood, including increases in flooding under future climate change scenarios, as this would require significant raising of the design road levels which would result in increased flood levels in the surrounding catchment.

The project will have negligible change on the overtopping of existing levees of the Hunter Valley Flood Mitigation Scheme during flood events

There would be a negligible change in the overtopping of the existing levees of the Hunter Valley Flood Mitigation Scheme as a result of the project. The project would be designed and constructed to ensure there are no changes to flow capacity, and as such are not expected to impact operation, function or structural integrity of the scheme (including the floodgates).

However, the project will have a direct impact on the flood levee system where bridge piers are erected on or in close proximity to the levee. Any impact to the scheme will need approval from DPE Water (Hunter Valley Flood Mitigation team) who is responsible for the scheme's assets. DPE Water may require the Proponent to rebuild elements of the levees or provide extra stability or protection around the levees where piers intersect the levee.

In regards to potential localised scouring around viaduct piers, scour protection is required to be provide around piers in close proximity to the levees to minimise erosion during flood events.

6.4 Biodiversity

Note: *References to sections of the EIS and Submissions Report have been included in this section to satisfy the Commonwealth's assessment requirements.*

The project will have direct and indirect impacts to threatened ecological communities (TECs) and threatened species listed under the *Threatened Species Conservation Act 1995* (TSC Act) (see **Sections 4.2** and **4.4** regarding the application of TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). However, there is the potential for these impacts to be reduced during the detailed design of the project. The Proponent has committed to implementing a range of mitigation measures, including habitat connectivity structures such as fauna crossings and exclusion fencing, protecting aquatic habitat during construction, managing the

vegetation clearing process, revegetation upon the completion of construction, weed management, and directing lighting away from vegetated areas where possible to reduce potential impacts on flora and fauna.

The project has avoided impacts to biodiversity where possible. Where impacts to biodiversity values cannot be avoided and all practicable measures have been proposed to minimise impacts, the residual impacts on biodiversity values will be offset under the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014), including the acquisition and retirement of ecosystem and species credits. Impacts to key fish habitat will be offset in accordance with the *NSW Policy and Guidelines for Fish Habitat Conservation and Management Update 2013* (DPI, 2013).

The Department has recommended conditions of approval which specify the ecosystem and species credits required for the project, offsetting of impacts to key fish habitat, measures to protect the Estuary Cod, requirements for tree replacement and a Flora and Fauna Management Sub-plan to manage impacts on biodiversity during the construction of the project.

Issue

The project is located within the Hunter Sub-region of the Northern Sydney Basin Interim Biogeographic Regionalisation for Australia Bioregion and the NSW North Coast Bioregion. The Hunter Sub-region occurs about 150 kilometres north of Sydney, extending from Gosford-Wyong on the central coast to north of Newcastle and inland to Maitland, Singleton and Muswellbrook. It features rolling hills, wide valleys, and a meandering river system (Hunter River) on a wide floodplain. Remnant or regenerating eucalypt woodland and forest occurs more extensively in the upper reaches and foothills with large areas cleared for grazing and urban development in the lower areas. Patches of remnant eucalypt forest and woodland occur in the western (Black Hill) and eastern (Tomago to Heatherbrae) parts of the study area. Mangrove forest, saltmarsh and freshwater reed swamps occur near Hunter River estuary.

Bilateral Agreement

The Proponent has addressed the Commonwealth requirements and assessed the impacts on Matters of National Environmental Significance (MNES). Sections of the EIS relevant to MNES include:

- Chapter 4 – Proposed development and alternatives
- Chapter 6 – Consultation
- Chapter 9 – Biodiversity
- Chapter 23 – Cumulative impacts
- Chapter 24 – Environmental management measures
- Chapter 26 – Proposal justification and conclusion
- Appendix C – Schedule 4 of the Environment Protection and Biodiversity Conservation Regulations 2000 (Commonwealth) checklist
- Appendix I – Biodiversity Assessment Report.

The section of the RtS relevant to MNES is Appendix E - Revised Biodiversity Assessment Report.

Species and communities listed under the EPBC Act would be impacted

The former Commonwealth Department of the Environment and Energy (now Department of Climate Change, Energy, the Environment and Water - DCCEEW) deemed the project a controlled action on 14 January 2019 as the proposed action is likely to have a significant impact on the following controlling provisions of the EPBC Act:

- listed threatened species and communities (section 18 and section 18A).

DCCEEW considered the proposed action is likely to have a significant impact on the following MNES:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South-East Queensland ecological community – endangered under the EPBC Act
- Koala (*Phascolarctos cinereus*) (combined populations of Queensland, NSW, and the ACT) – vulnerable under the EPBC Act
- Swift Parrot (*Lathamus discolor*) – critically endangered under the EPBC Act
- Regent Honeyeater (*Anthochaera phrygia*) – critically endangered under the EPBC Act
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable under the EPBC Act.

Based on the referral information, DCCEEW determined that significant impacts are unlikely for Drooping Red Gum *(Eucalyptus parramattensis* subsp*. Decadens),* Small-flower Grevillea (*Grevillea parviflora* subsp. *Parviflora),* Tall Knotweed (*Persicaria elatior),* Australasian Bittern (*Botaurus poiciloptilus*), Australian Painted Snipe (*Rostratula australis*) and Green and Golden Bell Frog (*Litoria aurea*).

The Proponent indicated that the project would potentially impact on habitat of the New Holland mouse (*Pseudomys novaehollandiae*) which is listed as vulnerable under the EPBC Act and the Spotted-tail quoll (*Dasyurus maculatus*) which is listed as endangered under the EPBC Act. DCCEEW made no mention of the significance of these impacts.

Since the referral of the project to the Commonwealth, the Proponent has refined the construction footprint. This has resulted in increased impacts to:

- Drooping Red Gum *(Eucalyptus parramattensis* subsp*. Decadens)* (vulnerable species) – increase from 16 impacted individuals to 34 individuals
- Spotted-tailed Quoll – area impacted has increased from 45 hectares to up to about 50 hectares of associated Plant Community Types (PCTs) that may provide suitable habitat
- New Holland Mouse – area impacted has increased from 20.4 hectares to 28.6 hectares of associated PCTs that may provide suitable habitat
- Australian Painted Snipe – area impacted has increased from 33 hectares to up to 43.7 hectares of associated PCTs that may provide suitable habitat.

In addition, the Proponent has identified other mapped PCTs within the construction footprint that would provide suitable habitat for the Australasian Bittern and revised the impacted habitat as follows:

- Australasian Bittern habitat – area impacted has increased from around five hectares to up to approximately 43.7 hectares of associated PCTs that may provide suitable habitat.

The Department has undertaken a detailed consideration of Commonwealth matters in consultation with DCCEEW, including consideration of the Proponent's assessments of significance and the relevant approved conservation advice, recovery plans and threat abatement plans (TAPs). A summary of this assessment is provided in **Appendix G.**

Clearing of native vegetation will impact threatened ecological communities

The project would directly impact approximately 173.8 hectares of native vegetation, across 14 PCTs and 21 vegetation zones. This represents about 13.6 per cent of native vegetation within the assessed landscape (1,277 hectares). **Table 16** provides details of all impacted vegetation zones and PCTs, their general condition, conservation status, and area impacted.

Table 16 | Direct impacts to native vegetation (Source: RtS)

Plant Community Type (PCT)	Condition	TEC under the TSC Act	TEC under the EPBC Act	Area (ha)
Spotted Gum – Broadleaved Mahogany – Red Ironbark shrubby open forest (1590) (HU804)	1. Good 2. Moderate 3. Regenerating	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions (Endangered)	-	24.68 8.04 8.21
Grey Ironbark – Broadleaved Mahogany – Forest Red Gum shrubby open forest on Coastal Lowlands of the Central Coast (1588) (HU802)	4. Moderate 5. Regenerating	-	-	6.92 0.82
Smooth-barked Apple - Blackbutt - Old Man Banksia woodland on coastal sands of the Central and Lower North Coast (1646) HU860)	6. Good 7. Poor	-	-	20.80 6.93
Smooth-barked Apple - Red Mahogany – Swamp Mahogany – *Melaleuca sieberi* heathy swamp woodland of coastal lowlands (1649) (HU863)	8. Good	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Endangered)	-	1.33
Forest Red Gum grassy open forest on floodplains of the lower Hunter (1598) (HU812)	9. Moderate	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions (Endangered)	-	0.51
Prickly-leaved Paperbark forest on coastal lowlands of the Central Coast and Lower North Coast (1716) (HU930)	10. Good	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Endangered)	-	1.88
Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast (1717) (HU931)	11. Good 12. Poor	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Endangered)	-	3.90 6.66
Broad-leaved Paperbark - Swamp Oak - Saw Sedge swamp forest on coastal lowlands of the Central Coast and Lower North Coast (1724) (HU938)	13. Good	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Endangered)	-	1.64

Swamp Oak - Sea Rush - *Baumea juncea* swamp forest on coastal lowlands of the Central Coast and Lower North Coast (1727) (HU941)	14. Moderate	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Endangered)	Does not meet size or condition criteria for Coastal Swamp Oak Forest under EPBC Act	8.84
Water Couch - Tall Spike Rush freshwater wetland of the Central Coast and lower Hunter (1736) (HU950)	15. Good 16. Moderate	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	-	33.29 25.92
Jointed Twig-rush sedgeland (1742) (HU956)	17. Good	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	-	1.79
Phragmites australis and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion (1071) (HU673)	18. Good	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Endangered – in part 8.03 ha)	-	8.05
Saltmarsh Estuarine Complex (1746) (HU960)*****	19. Good	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregion (Endangered)	Subtropical and Temperate Coastal Saltmarsh (vulnerable – in part 0.63 ha meets condition criteria)	1.33
Grey Mangrove low closed forest (1747) (HU961)*****	20. Good 21.Moderate	-	-	2.05 0.23
Total area of clearing		**136.07 ha**	**0.63 ha**	**173.82**

Note*: *According to the FBA, PCTs that are classified as being in the saline wetlands vegetation formation must be assessed according to the Fisheries NSW policy and guidelines. There are two PCTs impacted by this project that are saline wetland formations.*

The Proponent has committed to provide ecosystem credits for direct impacts to 173.82 hectares of native vegetation in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014).

The project would also impact about 16.1 hectares of mapped wetlands in *State Environmental Planning Policy (Resilience and Hazards) 2021*, which includes approximately 3.6 hectares of saltmarsh and mangrove communities. Offsets for these saline vegetation communities will be provided in accordance with the *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI, 2013).

Threatened flora species would be impacted by construction

Construction of the project would directly impact four threatened flora species:

- Drooping Red Gum – 34 individuals would be cleared (Vulnerable under the TSC Act and EPBC Act)
- Tomaree Donkey Orchid or Sand Doubletail (*Diuris arenaria)* – 206 individuals would be cleared (Endangered under TSC Act)
- Netted Bottle Brush (*Callistemon linearifolius)* – 159 individuals would be cleared in the southern end of the construction footprint which is a large portion of the local population of this species (Vulnerable under TSC Act). The remaining plants would be located on the edge of the new road and therefore subject to indirect impacts through edge effects

- Tall Knotweed – three individuals would be cleared. This is an isolated population that may have dispersed from swamp forest and wetlands to the east of the study area (Vulnerable under TSC Act and EPBC Act).

A further two threatened flora species - *Maundia triglochinoides* (Vulnerable under TSC Act) and Small-flower Grevillea (*Grevillea parviflora* subsp. *Parviflora)* (Vulnerable under TSC Act and EPBC Act) - were recorded near but not within the construction footprint. Neither species would be impacted, with the Proponent having removed a proposed new link road at Tomago during the concept design development (and prior to referral to the Commonwealth) to specifically avoid a population of about 200 Small-flower Grevillea.

Vegetation clearing will impact threatened fauna species

Targeted field surveys recorded ten of the 34 threatened fauna species considered to have a moderate to high likelihood of occurrence in the study area:

- Varied Sittella (Vulnerable, TSC Act)
- Grey-crowned Babbler (Vulnerable, TSC Act)
- Masked Owl (Vulnerable, TSC Act)
- White-bellied Sea-Eagle (Vulnerable, TSC Act)
- Wallum Froglet (Vulnerable, TSC Act)
- Squirrel Glider (Vulnerable, TSC Act)
- Grey-headed Flying-fox (Vulnerable, TSC Act and EPBC Act)
- Little Bent-winged Bat (Vulnerable, TSC Act)
- Eastern False Pipistrelle (Vulnerable, TSC Act)
- Eastern Coastal Free-tailed Bat (Vulnerable, TSC Act).

Nine threatened fauna species listed under the EPBC Act were assessed as having a moderate to high likelihood of occurrence within the construction footprint:

- Regent Honeyeater (Critically Endangered and Migratory, EPBC Act) – 1 record
- Swift Parrot (Endangered and Migratory, EPBC Act) – 9 records
- Australasian Bittern (Endangered and Migratory, EPBC Act) – 25 records; 43.74 hectares of wetland PCTs of suitable habitat to be impacted
- Australian Painted Snipe (Endangered and Migratory, EPBC Act) – 11 records; 43.74 hectares of suitable wetland habitat to be impacted
- Spotted-tailed Quoll (Endangered, EPBC Act) – 14 records; about 50 hectares of suitable habitat to be impacted
- Koala (Endangered[1], EPBC Act) – 2,231 records; 89.1 hectares of suitable habitat to be impacted
- New Holland Mouse (Vulnerable, EPBC Act) – 42 records; 28.6 hectares of suitable habitat to be impacted
- Grey-headed Flying-fox (Vulnerable, EPBC Act) – 402 records; foraging only in the locality

[1] At the time of EPBC Act controlled action referral, the Koala was listed as vulnerable.

- Green and Golden Bell Frog (Vulnerable, EPBC Act) – 8,650 records (based on NSW Wildlife Atlas records for the locality).

These species were targeted during field surveys and only one species – Grey-headed Flying-fox – was recorded in the construction footprint. The species was recorded flying overhead and foraging in the construction footprint. An assessment of riparian communities as potential breeding habitat for the species was undertaken, which concluded that no camps are present and that the construction footprint did not support suitable roosting or breeding habitat. The nearest roost camps are at Carrington Mangroves and Blackbutt Reserve, ten and 12 kilometres from the construction footprint respectively.

No Koalas were detected during targeted surveys of known habitat within the construction footprint. The Proponent's Biodiversity Assessment Report (BAR) notes that there are records of the species to the north of the construction footprint (Tomago to Heatherbrae) and the presence of suitable dry sclerophyll habitat containing primary Koala food tree species (e. g. Forest Red Gum) in PCTs 1588 and 1590. As such, the area is likely to be important for this species' movement, dispersal, and refuge. There is a low probability that Koalas occur in the western part of the construction footprint at Black Hill, due to the lack of historic and recent survey records. A total of 89.1 hectares of Koala habitat containing primary Koala food tree species would be cleared by the project as shown in **Figure 26** and **Figure 27**. The BAR considered this loss of habitat would have a low impact on the broader Port Stephens Koala population.

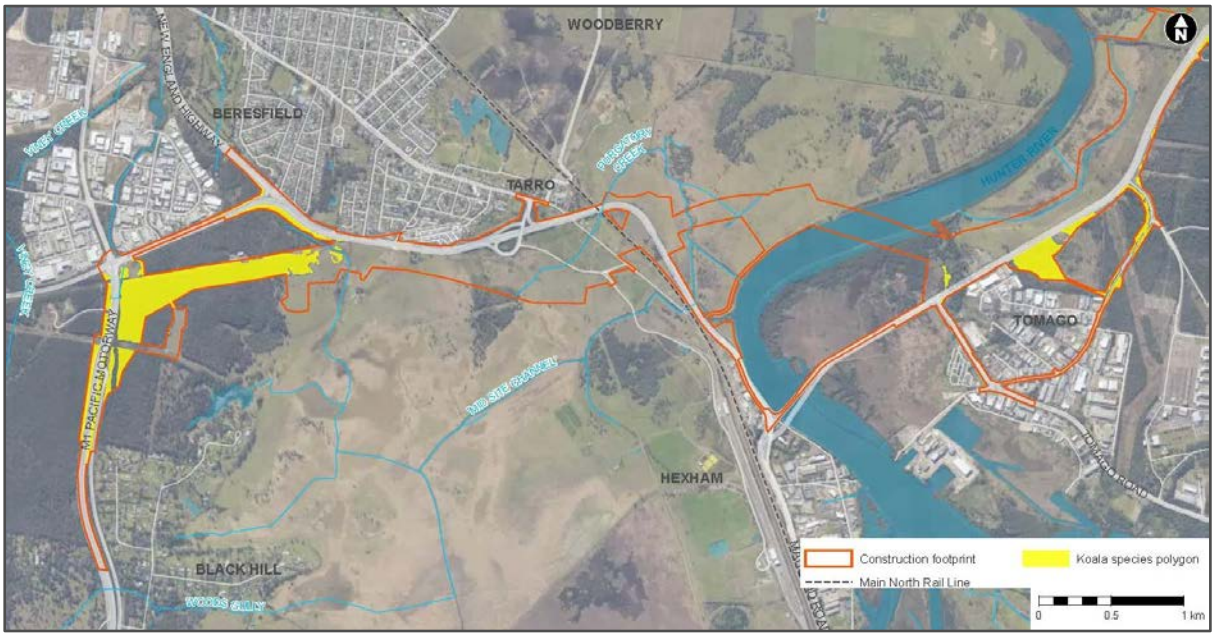


Figure 26 | Location of koala habitat within the project footprint (Source: RtS)

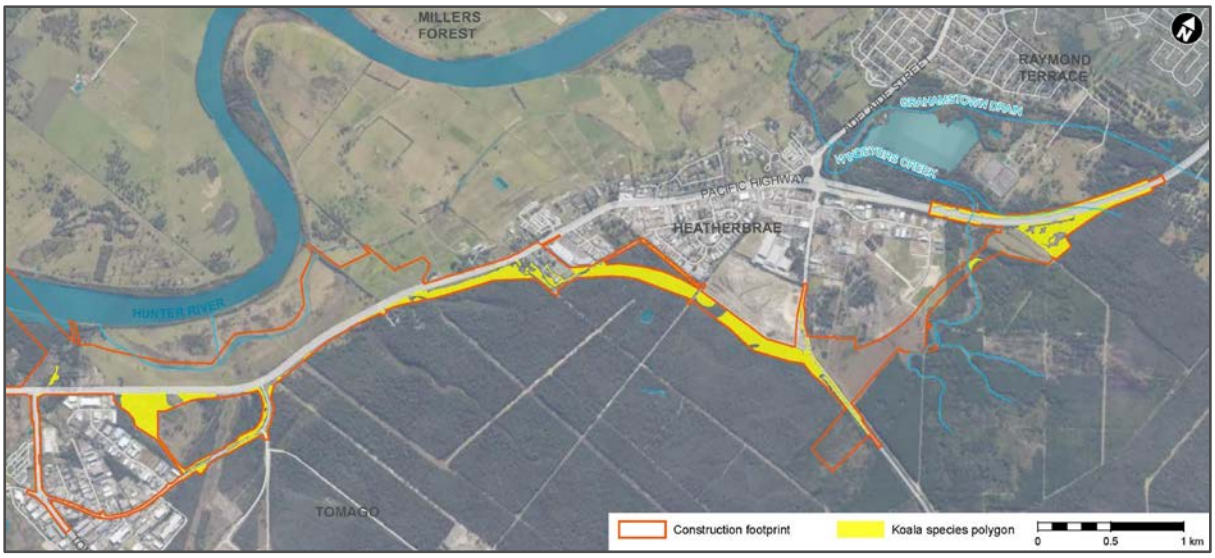


Figure 27 | Location of koala habitat within the project footprint (Source: RtS)

The project would clear approximately 49 hectares of grassy meadows with shallow seasonally inundated wetlands and 7.7 hectares of Typha rushland which is considered to be Green and Golden Bell Frog (GGBF) potential wetland habitat. The project is not considered to have a significant impact on the species, because no individuals were detected during survey periods and suitable wetland habitat occurs 2-3 kilometres to the south at Hunter Wetlands National Park where most of the records of this species exist, especially on Kooragang Island.

The loss of hollow-bearing trees is likely to be highest in dry sclerophyll forest with shrubby understorey in the northern part of the construction footprint, from Hunter Region Botanic Gardens to Masonite Road at Heatherbrae. Nine threatened species that have been recorded or are likely to occur in the construction footprint would be impacted by the removal of hollow-bearing trees. These include the Glossy Black-Cockatoo, Little Lorikeet, Powerful Owl, Masked Owl, Eastern False Pipistrelle, Eastern Coastal Free-tailed Bat, Yellow-bellied Sheathtail-Bat, Greater Broad-nosed Bat and Squirrel Glider.

Vegetation clearing for the project would reduce the amount of foraging resources - foliage, nectar, and sap exudates - available to threatened forest-dependent fauna such as Squirrel Glider, Eastern Pygmy Possum, Koala and microbats. Six of the 14 PCTs impacted by the project contain winter flowering tree species such as Spotted Gum, Swamp Mahogany, Forest Red Gum and Grey Ironbark. These supply nectar and pollen to the threatened Squirrel Glider, Regent Honeyeater, Grey-headed Flying-fox and Little Lorikeet. The loss of these resources would account for 37 per cent (about 63.9 hectares) of the total amount of native vegetation to be cleared within the construction footprint. The residual impacts to some of these species is considered to be significant and will require offsetting (refer to 'Consideration' in this section).

Construction will have minor impacts on threatened aquatic fauna species and their habitat

An aquatic habitat assessment was undertaken at 22 waterway locations within and near the construction footprint. Six of these sites are mapped as key fish habitat by DPI Fisheries and meet the definition of key fish habitat under the *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI, 2013) - Purgatory Creek downstream of its junction with Hunter River, Hunter River at the proposed bridge crossing, Hunter River midstream and downstream, an inside bend of Hunter River within an unnamed coastal wetland, and at Viney Creek. Construction of the main bridge

over the Hunter River would result in the loss of key fish habitat and the removal of about 1.3 hectares of Saltmarsh Estuarine Complex and 2.3 hectares of Grey Mangrove Low Closed Forest.

The BAR identified five threatened and protected fish species with potential to occur in the area. Only the Estuary Cod was considered to potentially occur within the construction footprint. This species is protected under the *Fisheries Management Act 1994*.

Impacts to groundwater dependent ecosystems would be short-term, minimal and localised

Five aquatic groundwater dependent ecosystems (GDEs) were identified within the construction footprint:

- PCT 1071 – *Phragmites australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion (8.05 hectares located)
- PCT 1736 – Water Couch - Tall Spike Rush freshwater wetland of the Central Coast and Lower Hunter (59.21 hectares)
- PCT 1742 – Jointed Twig-rush sedgeland (1.79 hectares)
- PCT 1746 – Saltmarsh Estuarine Complex (1.33 hectares)
- PCT 1747 – Grey Mangrove low closed forest (2.28 hectares).

One potential terrestrial GDEs - Coastal Dune Dry Sclerophyll Forests on the Tomago Sandbeds (Tomago and Heatherbrae) with eight member PCTs was also identified in the construction footprint.

Groundwater levels within the Tomago Sandbeds (which are protected for drinking water supply under *Hunter Water Act 1991*) are typically 1.6-2.7 metres below ground level. This means that there is the potential for groundwater to be encountered during cutting and filling activities. However, the Proponent has indicated that the extent and duration of these activities in any one area would be short term and the works would be progressive across the construction footprint. As a result, any dewatering during excavation activities in a set location would only be for a short period of time meaning that drawdown propagation would also be limited and short term. As such, impacts on GDEs in the construction footprint would not be significant, however minor, short-term adverse impacts on their condition could occur.

Construction has the potential to increase the spread of weeds, pests, and pathogens

A total of 32 high-threat weed species occur within the construction footprint, of which eight are declared as Priority Weeds for the Hunter Region under the *Biosecurity Act 2015*. Of these species, five are listed as Weeds of National Significance - Alligator Weed, Asparagus Fern, Lantana, Blackberry, and Fireweed. The level of infestation of high threat weeds in the construction footprint varies from low to high.

Vegetation clearing and fragmentation of small patches of native vegetation are unlikely to result in the establishment of predator pest species such as the European Red Fox and Cat. However, increased vegetation fragmentation could increase the abundance of the Noisy Miner and Bell Miner and exacerbate the key threatening process of aggressive exclusion of birds from potential woodland and forest habitat. This could result in an increase in the abundance and severity of Bell Miner Associated Dieback.

The BAR identified three pathogens listed as key threatening processes under the EPBC Act and/or TSC Act that could potentially occur in the project area during construction. These are dieback

caused by Phytophthora, infection of frogs by chytrid fungus causing the disease chytridiomycosis, and introduction and establishment of exotic Rust Fungi on the plant family Myrtaceae. While these pathogens were not observed or tested for in the construction footprint, the potential for pathogens to occur should be treated as a risk during construction as these diseases can be transported by foot, vehicles, and machinery.

Submissions

Community and interest groups

Submissions from the community:

- supported the maintenance of existing fauna connectivity and protection of wildlife habitat
- recommended that the Proponent purchase more land to offset impacts on koala habitat, install fauna fencing from Masonite Road bridge south to Tomago, and provide a fauna underpass at Masonite Road, to reduce vehicle strike and facilitate fauna movement along an existing corridor
- suggested that any biodiversity offsets generated by the project should be used to improve local conservation areas such as Hunter Wetlands National Park.

Councils

Port Stephens Council recommended the Proponent undertake preferred Koala feed tree replacement planting to offset their removal or prioritise biodiversity offsets for koalas within the Port Stephens LGA. The Council was concerned that the BAR may have incorrectly identified an EEC (River-flat Eucalypt Forest on Coastal Floodplains) as a swamp forest community (PCT 1724), located in the south-east corner of the intersection between Pacific Highway and Old Punt Road at Tomago. The council recommended that impacts to this EEC should be avoided or minimised. Council also requested the inclusion of the Eastern Grass Owl as an ecosystem credit species.

City of Newcastle commented on stormwater discharge impacts on wetland systems, sought clarification of flooding impacts, and raised concerns about hydrological design targets for coastal SEPP wetlands. City of Newcastle recommended that expert ecological advice be obtained to clarify the impact on Hunter River wetlands of raising the height of culverts under the upgraded highway and how these impacts will be mitigated.

Agency advice

EHG (BCD) advised that the revised BAR assessed the project in accordance with State and Commonwealth legislation/requirements and that biodiversity credits have been calculated in accordance with the BBAM.

DPI Fisheries requested conditions relating to offset management, design of creek crossings, restoration of tidal flows, and wastewater/stormwater management.

DPE Water and Natural Resources Access Regulator (NRAR) advised that proposed construction works in riparian areas and within watercourses must follow *NRAR Guidelines for Controlled Activities on Waterfront Land*. NRAR guidelines for vegetation management plans were recommended to be used in the revegetation of riparian areas impacted by construction.

Hunter LLS identified options for offsetting impacts of the project on aquatic habitats. These included remediation works comprising ecological restoration, improving tidal flows, floodplain management, and creating a climate change adaptation corridor on key floodplain properties purchased as part of the project.

Hunter Water Corporation (HWC) requested clarification on why the construction footprint could not avoid a small BioBanking site beside Hunter Region Botanic Gardens and how this impact would be offset in the Biodiversity Offset Strategy. HWC also suggested that some of its landholdings near the project area could be considered as potential biodiversity stewardship sites to assist the Proponent meet its biodiversity credit obligation. HWC identified other offset options such as the protection and rehabilitation of important wetland habitat on Hunter River floodplain and restoration of Koala habitat in the derelict pine plantation at Heatherbrae.

Consideration

The assessment adequately considers Matters of National Environmental Significance (MNES)

The BAR considered MNES under sections 18 and 18A of the EPBC Act that are known to occur or potentially occur in the project area. The Department's assessment of MNES is contained in **Appendix G**. Construction of the project would impact on *Persicaria elatior* (Tall Knotweed) and *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum) which are MNES threatened flora species under the EPBC Act. Although 34 individuals of Drooping Red Gum would be removed, their localised occurrence on atypical clay soils suggests the trees may have been planted. Their removal would not have a significant impact on the viability of this species, due mostly to the retention of the larger core population outside the construction footprint. However, any loss of these individuals is considered as a significant impact under the EPBC Act and will require offsetting in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* and the FBA.

The removal of three individual Tall Knotweed plants will not significantly impact the viability of the species in the local region, as the quality of the habitat for this species in this location is poor, mainly due to grazing by cattle. The habitat does not perfectly match habitat characteristics documented for this species (apart from the disturbed areas), and therefore it is likely that these individuals have dispersed from nearby swamp forest and wetlands to the east. However, under the FBA, the removal of the Tall Knotweed and Drooping Gum plants generates species credits which will need to be retired as part of the offsetting process.

The project is unlikely to have a significant impact on the MNES threatened fauna species the Regent Honeyeater, Swift Parrot, Spotted-tailed Quoll, Grey-headed Flying-fox, New Holland Mouse, and GGBF identified as likely to occur in the construction footprint given the availability of suitable foraging and breeding habitat nearby. As there are no residual impacts to these species, species offsets are not required under the *NSW Biodiversity Offsets Policy for Major Projects* and the FBA. However, it should be noted that PCTs that could be used for foraging by Regent Honeyeater, Swift Parrot, Grey-headed Flying-fox are being offset due to significant residual impacts to those PCTs from clearing. Further detailed consideration of these MNES threatened fauna species can be found in **Appendix G**.

Construction would require clearing of potential habitat of the Australian Painted Snipe, the Australasian Bittern, and the Koala. The BAR indicated that significant impacts to the Australian Painted Snipe would be unlikely and so species and ecosystem credits are not required. The Proponent's proposal to secure ecosystem credits for impacts to PCTs would address minor residual impacts to known and potential foraging habitats for this species.

The project has been designed to avoid the core habitat forest of the Port Stephens Koala population to the east and north of the construction footprint. However, the project would result in the direct loss of habitat resulting in a significant impact for the Koala. The Proponent has committed to secure offsets to address this residual impact.

The BAR recognises that there will be significant residual impacts on the Australasian Bittern from clearing of potential foraging and breeding habitat. These impacts will require the generation of species offsets.

Mahony's Toadlet[2] was not recorded during any of the surveys undertaken for the project. However, the Mahony's Toadlet is known to use the same habitat as the Wallum Froglet, and on this basis the Proponent has used the impacts on the suitable habitat on the froglet to assess the potential impact to the toadlet and expected credit requirements.

The Department is satisfied with the revised BAR's conclusions (Appendix E of the RtS) on impacts to MNES and recommends that the Commonwealth Minister for the Environment and Water:

- notes the Department's assessment of MNES in this report
- considers the Bilateral assessment in **Appendix F**
- considers the additional EPBC Act considerations, including the Australian Government's international obligations and the consideration of relevant approved conservation advice, recovery plans, and threat abatement plans in **Appendix G**
- adopts conditions C5(c), C12(d), E2 to E11 in **Appendix I** recommended instrument of approval.

Impacts to threatened species and ecological communities are unavoidable and measures would be implemented to reduce impacts

Construction of the project will require the clearing of native vegetation and there will be loss of some aquatic habitat and removal of hollow bearing trees, dead wood, dead trees, and bush rock. There will also be unavoidable indirect impacts to biodiversity outside the construction footprint. Through detailed planning and design, the Proponent has sought to avoid and/or minimise impacts on threatened species and ecological communities where possible. The Proponent has committed to reduce potential construction impacts on threatened species and ecological communities through a range of mitigation measures which include undertaking pre-clearing surveys, reducing impacts to riparian and aquatic vegetation, implementing unexpected species finds procedures and delineation of sensitive areas and retained vegetation. The Proponent also proposes to install fauna crossings to facilitate fauna connectivity across the project corridor at five the following locations:

- east-west rope crossing across the M1 Pacific Motorway (chainage 280)
- north-south rope crossing linked to existing trees, to include strategic planting of eucalypts to improve link to existing vegetation (Chainage 2330)
- north-south rope crossing to link isolated patch of remnant Smooth-barked Apple –Blackbutt open forest (Chainage 11100)

[2] Mahony's Toadlet was listed under the EPBC Act in March 2021. In accordance with section 158A of the EPBC Act, approval process decisions are not affected by listings and uplistings after a controlled action decision is made (for this project that was 14 January 2019). Therefore, impacts to Mahony's Toadlet will not be considered as part of the EPBC Act approval decision for the proposed action.

- two Glider poles linking east to west on Old Punt Road (Chainages 850 and 1110).

Fauna fencing will be provided in targeted areas along the project to deter Koalas from getting on to the new motorway, including at Black Hill, Heatherbrae, and along Masonite Road, to mitigate risk of collision for transient and dispersing koalas. The provision of connectivity structures and fauna exclusion measures are supported by the Department.

The Department has reinforced the Proponent's commitment to manage construction impacts on threatened ecological communities and species by requiring, as conditions of approval:

- development and implementation of a Flora and Fauna Construction Sub-management Plan, to manage construction impacts on the biodiversity values of the project area. This Plan should be consistent with the goals, objectives, mitigation measures and monitoring requirements of Commonwealth approved conservation advice and any Recovery Plans for MNES threatened species and communities
- pre-clearing measures for the potential habitat of threatened flora and fauna species
- development and implementation of an unexpected finds protocol
- re-use of salvaged hollows, and replacement of woody debris and bush rock.

Residual impacts on threatened flora, plant communities and fauna species are considered significant and would be offset in accordance with the NSW Biodiversity Offsets Policy for Major Projects

Any residual impacts to threatened species and ecological communities following the application of avoidance and management measures is considered significant and requires offsetting in accordance with the *NSW Biodiversity Offsets Policy for Major Projects.* The Biodiversity Offset Strategy for the project (Appendix K of the revised BAR in the RtS) details which residual impacts will require offsetting, through obtaining ecosystem and species credits. The biodiversity credits required to offset impacts to plant communities and threatened species are shown in **Table 17** and **Table 18**, respectively. **Table 19** provides details on the PCTs that provide potential foraging habitat for MNES species and that are being offset due to the impact of clearing on those PCTs.

Table 17 | Ecosystem credits required for direct impacts to PCTs (Source: RtS)

Plant Community Type	Direct impacts (ha)	Number of credits
Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast (1717) (HU931)	10.56	473
Broad-leaved Paperbark - Swamp Oak - Saw Sedge swamp forest on coastal lowlands of the Central Coast and Lower North Coast (1724) (HU938)	1.64	77
Grey Ironbark - Broad-leaved Mahogany - Forest Red Gum shrubby open forest on Coastal Lowlands of the Central Coast (1588) (HU802)	7.74	497
Forest Red Gum grassy open forest on floodplains of the lower Hunter (1598) (HU812)	0.51	31
Jointed Twig-rush sedgeland (1742) (HU956)	1.79	122

Phragmites australis and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion (1071) (HU673)	8.05	340
Prickly-leaved Paperbark forest on coastal lowlands of the Central Coast and Lower North Coast (1716) (HU930)	1.88	107
Smooth-barked Apple - Blackbutt - Old Man Banksia woodland on coastal sands of the Central and Lower North Coast (1646) (HU860)	27.73	1,383
Smooth-barked Apple - Red Mahogany - Swamp Mahogany - *Melaleuca sieberi* heathy swamp woodland of coastal lowlands (1649) (HU863)	1.33	70
Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest (PCT 1590) (HU082)	40.93	2,274
Swamp Oak - Sea Rush - *Baumea juncea* swamp forest on coastal lowlands of the Central Coast and Lower North Coast (1727) (HU941)	8.84	427
Water Couch - Tall Spike Rush freshwater wetland of the Central Coast and lower Hunter (1736) (HU950)	59.21	2,310
Total ecosystem credits	170.21	**8,111***

***Note:** * This total is different to what is listed in the BBAM credit report as it does not include the saline communities Grey Mangrove low closed forest (HU961) or Saltmarsh Estuarine Complex (HU960) because these impacts will be offset under Fisheries NSW policy and guidelines.*

Table 18 | Species credits required for direct impacts to threatened species (Source: RtS)

Threatened species	Habitat impacted	Direct impacts (ha or plants)	Threatened species status under the EPBC Act or TSC Act	Number of credits
Eucalyptus parramattensis subsp. *decadens*	-	34 plants	Vulnerable under both EPBC Act and TSC Act	476
Diuris arenaria	-	206 plants	Endangered under TSC Act	15,862
Persicaria elatior	-	3 plants	Vulnerable under both EPBC Act and TSC Act	39
Callistemon linearifolius	-	159 plants	Vulnerable under TSC Act	2,226
Australasian Bittern	Potential foraging / breeding	43.74 ha	Endangered under bot EPBC Act and TSC Act	569
Black Bittern	Potential foraging / breeding	51.74 ha	Vulnerable under TSC Act	673
Koala	Potential foraging / dispersal	89.1 ha	Endangered under both EPBC Act and TSC Act	2,317
Wallum Froglet	Potential foraging / breeding	3.1 ha	Vulnerable under TSC Act	40
Mahony's Toadlet	Potential foraging / breeding	3.1 ha	Endangered under the EPBC Act and BC Act*	40
Total species credits				**22,242**

***Note:** * Newly listed species - not listed under the TSC Act however is listed under the BC Act 2016*

Table 19 | Habitat features and PCTs associated with impacted MNES (ecosystem credit species) (Source: RtS)

Species[1]	Habitat feature / component	Impact (ha)	Number of potential credits
Regent Honeyeater	No mapped important areas within the construction footprint. Site is considered low quality habitat. Impact has been calculated by the area of associated PCTs within the construction footprint, including PCT ID: 1590, 1646, 1649, 1717, 1724	82.1 ha of potential habitat	4,277
Swift Parrot	Impact has been calculated by the area of associated PCTs within the construction footprint, including PCT ID: 1590, 1646, 1716 and 1717	81.1 ha of potential habitat	4,237
Grey-headed Flying-fox	Land within 40 metres of rainforest, coastal scrub, riparian or estuarine communities. Impact has been calculated by the area of associated PCTs within the construction footprint, including PCT ID: 1747, 1716, 1590, 1646, 1717.	83.43 ha of potential foraging habitat	4,237

Notes:

1. *The Regent Honeyeater is a species credit species. However, the species was not recorded during targeted surveys, nor considered to be significantly impacted, therefore a credit obligation was not determined. However, impacts to the potential habitat of this species and two ecosystem credit species (Swift Parrot and Grey-headed Flying-fox) were quantified in the BAR, and PCTs associated with this habitat would be offset by like-for-like PCTs in accordance with the FBA.*
2. *Grey Mangrove low closed forest (1747) (HU961) is classified as saline marine environment and is not assessed as ecosystem credits under the FBA.*
3. *2.28 hectares is Grey Mangrove low closed forest (1747) (HU961) which is classified as saline marine environment and is not assessed as ecosystem credits under the FBA.*

The biodiversity values of the project area will be reviewed during detailed design and construction of the project, with the aim of reducing impacts where practicable. This process is common to the design and construction of large infrastructure projects. The Department supports this approach and has recommended a condition which enables the Proponent to review and update the ecosystem and species credit requirements.

The Department's recommended conditions require the Proponent to meet the biodiversity and offset obligations for ecosystem and species credits within 12 months of construction commencing. The retirement of the biodiversity credits must be carried out in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014) and can include:

- retiring credits under the TSC Act, and/or
- securing land with the National Parks & Wildlife Service, and/or
- making payments into the Biodiversity Conservation Fund, and/or
- providing supplementary measures or applying the variation criteria where like-for-like credits cannot be sourced in a Biodiversity Offset Strategy.

The Department notes that the project would impact on 0.6 hectares of a biodiversity stewardship site adjacent to the Hunter Region Botanic Gardens and that this cannot be avoided. The Proponent has confirmed that the site is not part of an EPBC Act approval offset. The Proponent has committed to offsetting this impact on accordance with the *NSW Biodiversity Offsets Policy for Major Projects* and NSW *Land Acquisition (Just Terms Compensation) Act 1991.*

Regarding Port Stephens Council's request to consider undertaking preferred Koala feed tree replacement planting to offset the removal of such trees, the Proponent advised it would only retain land that is within the operational road corridor. No additional Koala habitat plantings would be

provided in the road corridor, as it would put Koalas at risk from vehicle strike. The Department is satisfied that project has been designed to reduce impacts to Koala habitat, but recognises there will be residual impacts. Residual impacts to feed trees are considered significant and will require offsetting accordance with the *NSW Biodiversity Offsets Policy for Major Projects*.

Impacts on aquatic species and their habitats can be managed and would be offset

The Proponent proposes to implement the relevant practices in *Guide 10 - Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA, 2011) to protect and/or reduce the impact of construction activities on aquatic habitats. To ensure that construction impacts to aquatic communities are effectively managed, the Department has recommended the development and implementation of a Flora and Fauna Construction Sub-Management Plan, which sets out the management measures that would be adopted. In addition, the Department has recommended the installation of a floating boom and silt curtain system around dredging activities and any nearby sensitive aquatic environments, and its retention after completion of dredging until the turbidity within the system returns to background levels, to protect aquatic habitats and species.

The Department has also recommended impacts on key fish habitat be offset at a 2:1 ratio in accordance with the *Policy and Guidelines for Fish Habitat Conservation and Management Update 2013.* Although the Proponent can choose to apply a monetary offset (i.e. contribution to the Biodiversity Offset Fund for fish habitat), the Department considers the monetary offset should be the last alternative and only implemented if all on-ground offset opportunities have been thoroughly investigated and determined to be unachievable. This is noted in the recommended instrument of approval.

In addition, the Department has recommended that measures must be implemented to protect the Estuary Cod, if detected, consistent with the measures listed in the BAR of the RtS.

Impacts on groundwater dependent ecosystems (GDEs) are minimal and can be managed

The Department acknowledges that to avoid impacts to GDEs, the Proponent has located the 2.6 kilometre-long viaduct to avoid a significant freshwater wetland. As the drawdown effect on groundwater would be short-term and localised, the Proponent has not proposed any measures to minimise construction dewatering of excavations. The project would not result in the ongoing lowering of the water table once operational, and as such there would be no long-term, permanent impacts on GDEs.

To ensure that the quality of groundwater resources that GDEs rely on is protected, the Department has recommended that the drainage design for the section of project that traverses the Tomago Sandbeds Catchment Area comply with the neutral or beneficial effect principles for construction and operation, i.e. there is no identifiable impact on water quality. The Department has also recommended that all sediment basins that intercept groundwater be lined to prevent contaminants in the basins from seeping into the groundwater. This is consistent with advice provided by the EPA.

Regarding City of Newcastle Council's concerns over the potential impact of stormwater discharges on wetlands and GDEs, the Department accepts the Proponent's response that potential changes to water levels due to operational drainage upgrades would generally reflect the existing variations in the hydrological regime and is therefore unlikely to impact on wetland communities.

Biosecurity risks can be managed

The Proponent has identified risks to biodiversity from diseases, pathogens, and weeds during the construction of the project, and has committed to develop protocols and implement measures to manage the risks in accordance with *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA, 2011). In addition, the Proponent is required to manage weeds in accordance with the *Biosecurity Act 2015* during construction and operation.

To minimise risks of transmitting weeds, disease and pathogens during construction, the Department has recommended that the Flora and Fauna Management Construction Sub-management Plan include weed management measures and hygiene protocols to address the requirements of the *Biosecurity Act 2015*. This would ensure that the transfer of weeds and its seeds, disease and pathogens, in particular *Phytophthora cinnamomi,* is minimised through the movement of construction personnel, machinery and vehicles.

Potential to restore tidal flows and a gradational wetland and rehabilitate the remaining salt marsh area along the Hunter River should not be discounted

DPI Fisheries, Local Land Services and DPE Water (Hunter Valley Flood Mitigation Scheme) expressed an interest in restoring tidal flows and rehabilitating floodplain land either side of the Hunter River. The agencies considered the potential for undertaking these rehabilitation activities is enhanced by the Proponent's ownership of land located on each side of Hunter River in this area. The Department is supportive of this approach because of potential positive ecological outcomes for the region; however, these works are considered to be outside the scope of the project. The total area identified and owned by the Proponent is approximately 340 ha (shown in **Figure 28**), as compared to the direct impact of the project of 3.61 ha of saltmarsh and mangrove PCTs. Under the current policy framework, a 2:1 offset ratio is general practice for impacts to key fish habitat (in this instance, mangroves and saltmarsh) required under the *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI, 2013 update). Even with the 2:1 offset ratio, the Project does not have the direct impact to mangroves and saltmarsh to quantify offsetting the approximate 340 ha land for the gradational wetland restoration.

Although this land has been identified as surplus to the project's operational requirements, the Proponent has committed to liaise with DPI Fisheries and Local Land Services and DPE Water (Hunter Valley Flood Mitigation) on potential transfer of this land to the appropriate agency. The Department considers this an appropriate response and has recommended a condition that requires the Proponent to liaise with DPI Fisheries, Local Land Services and DPE Water (Hunter Valley Flood Mitigation) six months prior to disposal of the surplus land, to ascertain if the agencies have an interest in acquiring the land.

Figure 28 | Approximate of Proponent owned land adjacent to the Hunter River, identified by agencies as suitable land for tidal flow rehabilitation (Source: TfNSW 2022).

6.5 Social and economic

The project will provide local and regional economic benefits through improved amenity in town centres and local access, due to traffic being removed from State and regional roads. It would also improve access to key employment areas such as Beresfield, Black Hill, Tomago, and Port of Newcastle for residents and workers in the region. However, it will remove through traffic from the New England Highway and Pacific Highway, resulting in less passing trade for local businesses. To address this loss, the Proponent will implement a signage plan that highlights the local centres and departure points to these from the motorway.

As with all major road projects, there will be direct impacts on some individuals, particularly those who will be affected by land acquisition. Approximately 43 per cent of properties directly located within the construction footprint are currently owned by the Proponent, with the remaining property acquisitions / property adjustments to be carried out in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991.* This is consistent with property acquirement and adjustment mechanisms used for other linear infrastructure projects in NSW.

Issue

Changes to the socio-demographic profile of the area due to construction is unlikely

The project is expected to create direct employment for approximately 1,050 workers per year (at its peak) and approximately 1,650 indirect jobs per year from businesses that supply goods and services that support construction activities. The Proponent has anticipated that workers would generally be sourced from areas within commuting distance of the project, resulting in relatively minor changes to population and demographics.

There would be minor impacts on community cohesion during construction, due to temporary disruptions to the use of some social infrastructure and meeting places, particularly the Hunter Region

Botanic Gardens. Although the construction and operational boundaries on the eastern side of the main alignment at the entrance of the botanic gardens has been reduced, visitors to the gardens would experience construction noise and temporary traffic disruptions throughout construction.

The project would impact local businesses through reducing passing trade

The EIS identified several businesses have some dependence on passing trade from the existing New England Highway and Pacific Highway. These businesses may experience a reduction in trade from the project due to changes in traffic arrangements (temporary detours and reduced parking) during construction. Conversely, accommodation and food and beverage businesses may experience increased trade from the construction workforce.

Once the project is operational, the traffic volumes along the bypassed sections of the New England Highway and Pacific Highway are expected to decrease. This may reduce the number of prospective customers for businesses heavily reliant on passing motorists, as drivers would need to make a conscious decision to exit the highway and travel into bypassed areas for fuel, food, lodging, or tourist attractions.

The project would involve property acquisition and leasing and access to infrastructure on private and public land

The Proponent has progressively purchased 43 lots for the project. An additional 36 lots held by 18 property owners would need to be acquired for the project. The project would also require temporary lease agreements with landowners of an additional seven properties (comprising nine lots) to accommodate construction work.

Partial acquisition of land may result in the severance or fragmentation of some rural properties, particularly larger land holdings comprising multiple lots. The project alignment has been designed to minimise the potential for partial acquisition of land which could result in the severance or fragmentation of rural properties. The viaduct across the Hunter River floodplain at Tarro and Woodberry would also allow access to be maintained within and between properties located either side of the project.

The construction phase of the project would also involve the adjustment and relocation of utilities, including electrical, sewer, water, and telecommunications. Operation of the project is not expected to impact on infrastructure or utilities.

Submissions

Community and special interest groups

Key issues raised in submissions include:

- exacerbation of health and social impacts
- bypass impacts on business profitability and the subsequent need for interventions to encourage tourists to stop over in Heatherbrae/Raymond Terrace
- concerns regarding the extent of the construction footprint into Muree Golf Club

Council

Maitland City Council noted that the proposal would provide additional opportunities for employment and housing within the Maitland LGA.

Port Stephens Council outlined the opportunity for the Proponent to provide public open space and facilities in Heatherbrae and signage to clearly identify Raymond Terrace and Heatherbrae as service centres to reduce the loss of potential trade and consequent economic impacts to businesses.

Consideration

Land acquisitions would be managed through established legislative processes

The Department notes that the Proponent has commenced consultation with potentially affected property owners whose property is yet to be acquired for the purposes of the project. The Proponent is required to carry out acquisitions / property adjustments in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991*, including provision of monetary compensation determined in accordance with the provisions of that Act.

The Department acknowledges the Proponent has also committed to working with property owners on their adjustment plans and access arrangements. Further, land subject to temporary use will be rehabilitated in consultation with landowners, taking into consideration the location, land use characteristics, size, and adjacent land uses. The Department is satisfied with these measures as they are consistent with property acquisition mechanisms used in other linear infrastructure projects in NSW.

The project would deliver broad economic benefits

During construction, there would be economic benefits arising from the purchase of local goods and services required for construction and to maintain the workforce's requirements.

Once operational, the project will provide local and regional economic benefits through improved amenity and local access. Business owners identified the social and economic benefits of the project include improved road safety and an increased local catchment of customers. The project would support the growth and development of employment precincts at Tomago and Thornton, Beresfield, Black Hill, and Port of Newcastle, through improved access for residents and workers in the region, supporting improved social and economic outcomes.

Impacts to local businesses are considered manageable and are expected to reduce over time through improved amenity and land use change

The Department acknowledges the potential for adverse impacts on local businesses during both the construction and operation of the project. During construction, the Proponent has committed to managing temporary access disruptions to businesses through providing temporary alternative access arrangements, in consultation with affected property and business owners. The Department considers this approach to be appropriate and has reinforced this commitment through a recommended condition of approval.

Although the project will remove through traffic from the New England and Pacific Highways, potentially impacting some passing trade reliant businesses, future strategic planning for Heatherbrae has identified this area for transition to provide more local services to accommodate a growing local population and become less reliant on passing trade. The project, through improvements to local amenity such as improved safety, reduced traffic congestion, and better local access, would also support a change in strategic direction for other centres in the area, supporting residential and commercial growth which is likely to result in businesses becoming less reliant on passing trade and becoming destination locations themselves.

The Proponent has also committed to develop a Directional Signage Plan in accordance with TfNSW signage policy. This Plan would be developed in consultation with stakeholders (typically businesses that associate with passing trade customers) to ensure effective and appropriate signposting for key locations along the project. The signage would inform the travelling public about services in Beresfield and Heatherbrae, to promote departure from the highway and continued patronage of local business by Pacific Highway motorists. This approach is consistent with other road projects that bypass towns and centres.

Construction of the project will encroach onto the Evergreen Stud Farm (at 2163 Pacific Highway, Heatherbrae) and bring traffic close to the racetrack. Traffic movements and traffic noise can spook and create anxiety in horses. The Proponent has been in discussions with the owner of the stud farm on the provision of measures to screen the property from traffic and has committed to continue working with the landowner to on such measures. The Department has recommended that the project must be delivered in a matter that minimises intrusion and disruption to the stud farm.

Impacts to bus services must not affect marginalised or vulnerable persons

The social assessment references movement of a bus stop / changes to the bus network. In non-metropolitan areas, the users of buses often include vulnerable and/or marginalised people. There was no evidence in the social assessment that the Proponent had engaged with users of the bus stop(s)/buses that are proposed to be relocated to understand how it may impact them. Consequently, the Department has recommended a condition requiring that bus stops / bus routes that may be altered as a result of the project must not adversely impact marginalised or vulnerable persons.

Employment and training targets for construction will be reported against

The NSW Government is committed to a diverse and inclusive workforce which achieves parity for Aboriginal people and women. To ensure employment and training targets relating to diversity are realised during the construction of the project, the Department has conditioned ongoing reporting by the Proponent against the objectives for economic participation and capacity building of Aboriginal people and diversity and gender equity in the workforce throughout construction.

6.6 Other issues

Issue	Findings	Recommendations
Aboriginal heritage	The project would directly impact 26 Aboriginal archaeological sites within the construction footprint, including artefact scatters, isolated artefacts, potential archaeological deposits (PADs), and potential artefact scatters (PAS). The Proponent's assessment concluded that five sites would be partially harmed and 21 would be totally harmed by the construction of the project. Five were identified as having high significance and four are of moderate to high significance. The sites would be subject to archaeological salvage excavation, surface collection and exclusion fencing. Registered Aboriginal Parties (RAPs) did not raise any objections and supported the	Recommended conditions include: • preparation of an Unexpected Heritage Finds Procedure to ensure impacts to archaeology are minimised • provide RAPs with the opportunity to be consulted about the Aboriginal cultural heritage management requirements of the project • preparation of Aboriginal Cultural Heritage Excavation Report(s) following the completion of Aboriginal archaeological excavations

Issue	Findings	Recommendations
	Proponent's archaeological methodology. In addition, Heritage NSW raised no objections. While the Proponent considered different route alignments as part of the options analysis, all alignments impact on Aboriginal heritage values. The location of ancillary facilities have been selected to avoid impacts to Aboriginal sites where possible. The alignment of the corridor has been located as close as practicable to existing development and infrastructure, to avoid impacts on less disturbed areas. Consultation with RAPs and field surveys identified three locations within the study area as sites of Aboriginal cultural values of local significance. These include cultural pathways/song lines, story places and places of spiritual significance. Whilst the Awabakal and Guringai Traditional Owners have identified the cultural value and significance of the area holistically, the Hexham, Beresfield 4, and Black Hill site areas have been highlighted as particularly significant, as they contain cultural sensitivity for burials, song lines, story places and represent the last remaining landforms of their type in the area. RAPs also identified a large established fig tree on the western bank of the Hunter River as having contemporary cultural values. RAPs requested the tree be protected from impact and workers educated of the tree's significance. The Proponent has committed to the preparation of an Aboriginal Cultural Heritage Management Plan to map areas of Aboriginal heritage value, identify management measures to be applied during construction, and outline opportunities for ongoing Aboriginal community engagement. The Department is satisfied that these measures along with the recommendation to demonstrate the consideration of Designing with Country, are an adequate framework for the management of Aboriginal cultural heritage.	• demonstrated integration of *Designing with Country* (Government Architect NSW, 2020) and the principles and objectives of the draft *Connecting with Country Framework* (Government Architect NSW, 2020) into the detailed design process • all reasonable measures are to be undertaken to avoid impacts to the established fig tree.
Air quality	<u>Construction impacts</u> During construction there will be the potential for localised dust impacts from activities, particularly during vegetation clearing, grubbing and removal, earthworks (stripping and stockpiling and cuttings), the excavation, placement and compaction of road base, rock crushing and screening, concrete and asphalt batching, and the movement of construction vehicles and equipment along the alignment. Dust generation from these activities is common with large linear infrastructure projects, and can be managed through standard management measures such as the use of water carts or soil binders, covering truck loads, and early rehabilitation of disturbed areas.	Recommended conditions include: • requiring all reasonably practicable measures be implemented, to minimise dust nuisance and the emission of other air pollutants during construction.

Issue	Findings	Recommendations
	Operational impacts An increase of vehicle emissions will occur in areas where there are no existing main roads such as east of Tarro, north of the Hunter River. In these locations, there are generally few sensitive receivers and related impacts are not expected. The project would remove a large amount of vehicle emissions along the existing main connection from the M1 Pacific Motorway to Heatherbrae, and most significantly from Tarro to the Hexham Bridge.	
Acid sulfate soils	A desktop assessment indicates that there is a high probability of acid sulfate soils (ASS) being present within the Hunter River sediments, and associated low lying floodplains and swamp areas within the construction footprint. The probability of potential ASS in northern parts of the construction footprint over the Tomago Sandbeds is low. The remaining portions of the construction footprint are considered as having no known occurrence of ASS. Construction activities that have the potential to expose ASS include excavation, bridge piling, dredging within the Hunter River, and general civil works. An estimated 90,000 m^3 of potential ASS will be excavated, with about 50,000 m^3 estimated to be actual ASS after testing. The majority of ASS is proposed to be treated and re-used on site. All excavated materials currently mapped as ASS would be tested and treated before reuse or disposed of in accordance with standard practices. The Proponent has committed to preparing an ASS Management Plan in accordance with the Acid Sulfate Soil Manual (ASSMAC, 1998), lime dosing of soils prior to disturbance, and transfer of soil to designated treatment areas and leaving it until such time as soil testing confirms its acceptable for reuse or removal off site. The Department considers the proposed measures are adequate to manage ASS.	Recommended conditions include: • preparation and implementation of a Soils and Surface Water CEMP Sub-plan that addresses the management of ASS.
Contamination	A desktop review of publicly available information, historical land use information, aerial imagery, government registers, and historical reports was conducted. The review concluded that several locations within the project boundary are considered as Areas of Potential Contamination Risk (AOPCR). These include: • three high risk AOPCR associated with asbestos waste at Tarro and Tomago, while the former mineral sands processing facility at Tomago has been identified as having naturally occurring radioactive materials • five medium AOPCR including the gravity trunk main at Tarro, buried waste along the project alignment, industrial and commercial operations at Tomago and Heatherbrae	Recommended conditions include: • preparation of a Dredging Management Plan • preparation of a Dredging Monitoring Plan to outline the monitoring regime to be followed during all dredging operations • use of silt curtains around dredging operations, until background water quality conditions such as turbidity are re-established • engagement of an EPA accredited site auditor throughout the investigation, remediation and validation stages • preparation of a SAQP

Issue	Findings	Recommendations
	• along the banks of the Hunter River where herbicide has historically been applied, and illegally dumped waste at various locations within the construction footprint • per- and polyfluoroalkyl substances (PFAS) were found in Tarro and Heatherbrae and Hunter River sediment outside the project footprint. Existing contamination within soils and groundwater in the construction footprint has the potential to be exposed or disturbed by construction activities such as: • excavation and earthworks • dewatering activities • dredging and piling activities within Hunter River. The Proponent has committed to engaging a site auditor throughout construction and preparing a Contaminated Land Management Plan. However, the Department and EPA consider further detailed investigations are required to confirm the types and levels of contamination within the project footprint. The EIS and RtS only provided a desk top analysis of potential contamination risk. In addition, a sampling and analysis quality plan (SAQP) needs to be prepared. The SAQP must ensure that field investigations and analyses will be undertaken in a way that enables the collection and reporting of reliable data to meet project objectives, including (where applicable) the relevant site characterisation requirements of the detailed or targeted site investigation.	• undertaking of detailed site contamination investigations • preparation of a Remedial Action Plan and accompanying Section B Site Audit Statement(s) • Site Audit Statement(s) and accompanying Site Audit Report(s) confirming the lands are suitable for the intended land use • preparation of an Unexpected Finds Procedure for Contamination.
Design and visual amenity	The visual impact assessment considered 19 key viewpoints, with nine of these having a high sensitivity to impact. The most significant impact would be to views over the Hunter River Floodplain due to the existing open, expansive views with minimal intrusion of urban elements. During construction, five of the viewpoints scored a high visual impact and ten viewpoints scored a moderate to high visual impact. During operation, two of the viewpoints scored a high visual impact and ten scored a moderate to high visual impact. Whilst a project of this scale will have visual impacts, the Department considers some of these will diminish over time as landscaping matures and more effectively screens infrastructure associated with the project. The proposed bridge and viaduct will be set amid a highly modified environment characterised by agricultural land uses and road and rail infrastructure and will be visually prominent. The Proponent has indicated that bridge design will be guided by the requirements, objectives and design principles set out in the document in *Bridge*	Recommended conditions include: • the preparation of a Design and Landscape Plan • a focus on high quality bridge design as part of the Design and Landscape Plan • demonstration of how the requirements set out in *Bridge Aesthetics: Design Guidelines to improve appearance of bridges in NSW* have been considered in the design and landscaping of the project • review of the viaduct and bridge design by TfNSW's Centre for Urban Design • the incorporation of Aboriginal and non-Aboriginal heritage interpretation into the design of built features (such as noise barriers, viaduct), including having regard to the results of any archaeological investigations • the provision of visual screening to residents along Eastern

Issue	Findings	Recommendations
	Aesthetics: Design Guidelines to improve appearance of bridges in NSW (Transport for NSW, 2019) to produce a bridge of aesthetic value. The project traverses the boundaries of the Awabakal, Worimi, and Wonnarua tribal groups. Proponent consultation with the Awabakal and Guringai Traditional Owners (as part of the EIS development) identified the high cultural value and significance of the area holistically and specifically identified the Hexham, Beresfield 4, and Black Hill site areas as areas of high significance. Whilst the Proponent's urban design assessment considered Aboriginal cultural heritage items and sites, it did not include sufficient detail on how the broader landscape significance of Country to Aboriginal people would be included in the design aspects of the proposal. The Project does not propose any new active transport facilities. During the project's operation, cyclists will use the 2.5 to three-meter-wide shoulders provided on the motorway, and two to 2.5-meter-wide sealed shoulders provided on-ramps. The ability for cyclists to use the road shoulders along the main alignment would provide a continuous cycle route between Black Hill and Raymond Terrace. Although active transport facilities were raised during the EIS exhibition, City of Newcastle indicated ongoing discussions are required to ensure the future Shortland to Tarro cycleway can be provided for.	Avenue that have a direct line of sight to the CSSI • a project design that does not preclude the delivery of the Hexham Junction (intersection of the Minmi to Hexham rail line corridor and the pipeline corridor) to Tarro active transport link.
Groundwater	There is the potential for groundwater to be adversely impacted through: • infiltration of contaminants into the Tomago Sandbeds aquifer catchment area during construction and operation of the motorway • water seeping out from detention basins (both construction sediment basins and permanent water quality basins) and into groundwater in areas where the water table is high, resulting in a potential pathway for contamination • migration of contaminants from the subsoils within the former mineral sands processing facility. The Proponent has committed to lining detention basins within the Tomago Sandbeds aquifer catchment area to avoid contamination of groundwater. This approach is supported by both the Department and EPA. In addition, the Tomago Sandbeds aquifer is a key source of water for the Hunter Water's drinking water supply system. The Hunter Water Corporation requires that developments in drinking water catchments demonstrate that the Neutral or Beneficial Effect principle is adopted in planning for developments to protect water quality. The project	Recommended conditions include: • detention basins that intercept saline or groundwater must be lined • drainage designs for the section of the project that traverses the Tomago Sandbeds aquifer must comply with the Neutral or Beneficial Effect principle.

Issue	Findings	Recommendations
	has been designed to minimise and avoid impacts to the Tomago Sandbeds aquifer, by conveying captured surface water in a sealed pipe network that will drain into lined detention basins, ensuring runoff is treated in basins. Due to the importance of the Tomago Sandbeds aquifer, the project will be required to comply with the Neutral or Beneficial Effect principles.	
Non-Aboriginal heritage	The project does not impact State heritage register listed items. However, it would impact on eight locally listed heritage items, including one item listed under section 170 of the *Heritage Act 1977* (Tarro Pumping Station). Of these, seven would be subject to negligible impacts. The project would have a minor impact on Hexham Shipbuilding Yards, due to the construction of an upgraded access track within the heritage curtilage of the item. However, there is a low potential for archaeological remains to be disturbed or destroyed by the works. The assessment identified one item of potential local heritage significance, Glenrowan Homestead (Site 1 farmhouse, sheds, remnant gardens and driveway; Site 2 weatherboard house; and Site 3 subsurface historical archaeological artefacts, most likely part of a rubbish dump associated with the homestead). This item would experience impacts due to the demolition and destruction of structures at Site 2, destruction of archaeological remains at Site 3, and disruption to the visual amenity of the heritage setting. There will be no direct impacts to the main house at Site 1 which has been considered as eligible for at-property architectural noise treatment. The Proponent has indicated that works in the location of the locally listed Tarro Historic Site should be avoided. However, if works were to take place in the curtilage of the site, the impact would be major due to impacts to subsurface archaeological deposits. The Proponent has clarified that potential works along Anderson Drive would be mainly for temporary traffic management and control measures. To ensure that the site is not impacted, the Department has recommended a condition that no works be undertaken within the heritage curtilage of the site, unless otherwise approved by the Planning Secretary. The Department acknowledges that development of the project alignment has considered the impact on heritage items, and that the proposed alignment has reduced the potential for heritage impacts as compared to earlier options and alignments considered by the Proponent. The Proponent has committed to protective measures including dilapidation surveys, archival	Recommended conditions include: • preparation of an Unexpected Heritage Finds Procedure to ensure impacts to archaeology are minimised • archaeological excavations to be overseen by a suitably qualified Excavation Director • no work is to be undertaken within the heritage curtilage of the Tarro Historic Site (listed as item A18 in the Newcastle LEP), and the site must not be destroyed, modified or otherwise adversely affected.

Issue	Findings	Recommendations
	photographic recording, archaeological salvage, barrier fencing, and architectural noise treatments, to reduce heritage impacts and ensure heritage values are retained and protected. These management measures would be detailed in the Proponent's Non-Aboriginal Heritage Management Plan. The Department is satisfied that the Proponent's mitigation measures, and the Department's recommended conditions, will appropriately mitigate heritage impacts.	
Surface water	The quality in waterways and wetlands upstream and downstream of the project generally do not meet the relevant NSW Water Quality Objectives. Water quality is typically high in nutrients and heavy metal concentrations having been impacted by urbanisation, mining, agricultural, industrial and commercial uses and land clearing. The Hunter Estuary Wetlands Ramsar site at Kooragang Nature Reserve is about 5.1 kilometre downstream of the project. All waterways have the potential to be impacted by increased sedimentation and spills during construction and operation. The Proponent has committed to implementing a range of water quality treatment measures during construction comprising erosion control, sediment control, sediment capture and treatment. A range of operational water treatment measures will be implemented including permanent detention basins and grassed swales, and accidental spill containment at basins in areas of aquatic sensitivity. In addition, basins and swales within the Tomago Sandbeds aquifer catchment area will be lined. The EPA raised concern over the lack of information on the potential discharge of pollutants to waterways and advised that construction water discharges will be regulated through an EPL. The EPA advised that the licence application will need to be accompanied by a water pollution impact assessment. The Department has recommended conditions to address these concerns. Regarding detention basins discharges, the water quality assessment concluded that the Hunter River would provide sufficient dilution of the basin discharges, so that they would meet the applicable water quality objectives and would not contribute to higher turbidity, total nitrogen, or total phosphate levels in the Hunter Estuary Wetlands Ramsar site. Consequently, the project is not expected to result in any significant impacts to water quality within the Ramsar site. To ensure this important wetland is not impacted from project-related discharges, the Department has recommended a condition which requires that the project be constructed and operated to maintain the NSW Water Quality Objectives where they are currently being achieved, or contribute toward their achievement where they are not being achieved.	Recommended conditions include: • the project be constructed and operated to maintain the NSW Water Quality Objectives where they are currently being achieved or contribute toward their achievement where they are not being achieved • erosion and sediment controls to be implemented taking into consideration Managing Urban Stormwater, Soils and Construction (Landcom, 2004) • sediments basins that intercept saline or groundwater must be lined. A note has also been included in the Instrument of Approval advising of EPA's requirement for a water pollution impact assessment.

Issue	Findings	Recommendations
Sustainability and climate change	The Proponent has committed to preparing a Sustainability Plan to ensure sustainability considerations are embedded across the project. The Proponent has made no mention of meeting the Infrastructure Sustainability Council (ISC) Infrastructure Sustainability (IS) Rating of 'Excellent', which is the standard practice for major road infrastructure projects. The Department considers that the proposed Sustainability Plan should set out the initiatives which would be implemented to achieve an 'Excellent' rating and has recommended a condition to this effect.	Recommended conditions include: • the preparation of a Sustainability Strategy to achieve a 'Design' and 'As built' rating of Excellent, under the ISC infrastructure rating tool • provision of evidence that the Proponent has achieved the ratings.
Waste	The design of the project has minimised the disposal of spoil, through pursuing a cut/fill balance and using prefabricated structures over the floodplain. Construction waste would be generated during site establishment, excavating, clearing, stripping, demolition of any existing structures, earthworks and construction of roads, walls, bridges and drains. All waste produced by the project would be managed in accordance with the *Protection of the Environment Operations Act 1997*. The Proponent has committed to preparing a Waste Management Plan and a Spoil Management Plan. The Department considers these plans adequately manage the movement and disposal of waste and spoil. The Department considers that waste can be adequately managed through the Proponent's proposed mitigation measures, including standard waste management practices of reduce, reuse and recycle, and the Department's recommended conditions for handling waste.	Recommended conditions include: • classification of all wastes in accordance with relevant EPA guideline • exportation of waste must be to licensed landfills.

7 Evaluation

The Department considers the project is in the public interest and should be approved, subject to conditions. The Department has reviewed the EIS, Response to Submissions report and assessed the key issues arising from the construction and operation of the project. This included consideration of:

- advice from relevant State government agencies, City of Newcastle, Maitland City Council and Port Stephens Council
- strategic NSW Government policies and plans;
- relevant matters and objects of the Environmental Planning and Assessment Act 1979;
- principles of ecologically sustainable development; and
- Matters of National Environmental Significance under the Environment Protection and Biodiversity Conservation Act 1999.

The project is consistent with NSW strategic planning policies and frameworks including:

- *Future Transport Strategy 2056*
- *NSW State Infrastructure Strategy 2018-2038* (Infrastructure NSW 2018)
- *Making it Happen in the Regions: Regional Development Framework* (DPI 2017)
- *National Road Safety Strategy 2021 – 2030* (Commonwealth of Australia, 2021)
- *Regional NSW Services and Infrastructure Plan*
- *Australian Infrastructure Plan and Priority List* (Infrastructure Australia, 2016)
- *National Freight and Supply Chain Strategy* (Transport and Infrastructure Council, 2019)
- *Lower Hunter Regional Strategy 2006 –2031*
- *Hunter Regional Plan 2036*
- *Hunter Regional Transport Plan*
- *Greater Newcastle Future Transport Plan*
- *City of Newcastle Local Strategic Planning Statement*
- *Raymond Terrace and Heatherbrae Strategy 2015 – 2031*

Key benefits provided by the project include:

- provides a free-flowing dual carriageway conditions between Sydney and the Queensland border
- provides an alternative route to the existing road network, improving freight and commuter connectivity and allowing free movement for freight travelling along this section of the NLTN
- improves accessibility for oversize and overmass freight, and enables end to end access by high productivity vehicles (PBS Class 2B heavy vehicles) along the M1 Pacific Motorway corridor across the Hunter River
- reducing congestion on the New England Highway and the Pacific Highway, which is expected to reduce rear-end and lane-change crashes

- reducing potential points of conflict between road vehicles on the network, minimising the risk of congestion-related incidents
- providing an improved road alignment, including wider lands and shoulders with barriers, minimising the risk and impact of any off-road crashes.

The Department is satisfied that the issues raised in submissions have been appropriately considered and responded to by the Proponent. The Proponent has identified and committed to implementing a range of environmental management measures to address identified environmental impacts. The Department has recommended conditions of approval to reinforce these commitments and address outstanding impacts. The Department considers that impacts can be mitigated, managed or offset through the implementation of the recommended conditions and the Proponent's commitments.

8 Recommendation

It is recommended that the Minister for Planning:

- **considers** the findings and recommendations of this report
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to approve the application
- **agrees** with the key reasons for approval listed in the notice of decision
- **grants approval** for the application in respect of SSI 7319, subject to the conditions in the attached project approval
- **signs** the attached project approval and recommended conditions of approval (see attachment).

Recommended by:

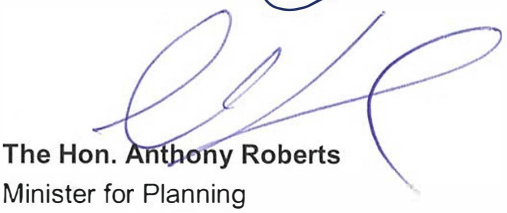
Daniel Gorgioski
Senior Planner
Transport Assessments

Recommended by:

Lisa Mitchell
A/Director
Transport Assessments

9 Determination

The recommendation is **Adopted / Not adopted** by:



The Hon. Anthony Roberts
Minister for Planning

Appendices

Appendix A – List of referenced documents

Future Transport Strategy 2056 (TfNSW, 2018)

NSW State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)

Making it Happen in the Regions: Regional Development Framework (DPI, 2017)

National Road Safety Strategy 2021 – 2030 (Commonwealth of Australia, 2021)

Regional NSW Services and Infrastructure Plan (TfNSW, 2018)

Australian Infrastructure Plan and Priority List (Infrastructure Australia, 2016)

National Freight and Supply Chain Strategy (Transport and Infrastructure Council, 2019)

Lower Hunter Regional Strategy 2006 –2031 (Department of Planning, 2006)

Hunter Regional Plan 2036 (Department of Planning and Environment, 2016)

Hunter Regional Transport Plan (TfNSW, 2014)

Greater Newcastle Future Transport Plan (TfNSW, 2018)

City of Newcastle Local Strategic Planning Statement (City of Newcastle, 2021)

Raymond Terrace and Heatherbrae Strategy 2015 – 2031 (Port Stephens Council, 2015)

M1 Pacific Motorway extension to Raymond Terrace Environmental Impact Statement (Transport for NSW, July 2021)

M1 Pacific Motorway extension to Raymond Terrace Submissions Report (Transport for NSW, June 2022)

Appendix B – Environmental Impact Statement

https://www.planningportal.nsw.gov.au/major-projects/projects/m1-pacific-motorway-extension-raymond-terrace

Appendix C – Submissions

https://www.planningportal.nsw.gov.au/major-projects/projects/m1-pacific-motorway-extension-raymond-terrace

Appendix D – Submissions Report

https://www.planningportal.nsw.gov.au/major-projects/projects/m1-pacific-motorway-extension-raymond-terrace

Appendix E – Community views

Issue	Consideration
Noise and vibration *Construction* • Residents will experience construction noise from high noise-generating activities such as land clearing, piling, utility works, concrete cutting and excavation • Out-of-hours works during the night time (1:00 pm to 7:00 am) have the potential to cause sleep disturbance • Heavy vehicle movements will generate noise. *Operation* • Existing wooden noise barriers should be replaced with new concrete barriers • Increases in operational traffic noise associated with traffic movements moving to and from the Emerging Black Hill Industrial Precinct.	*Assessment* • Consistent with most major civil projects, the project will exceed noise management levels (NML) set out in the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) during construction. Night-time construction noise impacts are unavoidable due to constraints associated with construction activities in active road corridors. • Operation of the project will result in exceedances of operational noise criteria (set out in the *Road Noise Policy* (DECCW, 2011) at 200 residences and 21 other sensitive receivers. Operational noise impacts that exceed the relevant road traffic noise criteria are predicted in areas where the new alignment is closer to residents and other sensitive receivers, and around the new interchange at Tarro. • To reduce operational traffic noise impacts, the Proponent has proposed to install new and upgraded noise barriers. The New England Highway at Tarro will be upgraded with low noise pavement. At-property architectural noise treatments will be provided at residences and other sensitive receivers where NMLs are exceeded following the implementation of the low noise pavement and barrier treatments. *Recommended Conditions/Response* • Active and ongoing consultation, flexibility in construction techniques, at source and at property mitigation, and coordinating and scheduling work to provide respite will be applied to manage noise impacts. • The Proponent is required to install at-property architectural noise treatments at eligible residences within 12 months of the commencement of construction. Where this is not possible, temporary acoustic treatments must be installed within six months of commencing construction. • Out-of-hours works would be approved and regulated through an Environment Protection Licence for work that cannot be performed during standard construction hours. • Batching plants cannot be established at construction ancillary facility AS4 in Tarro to prevent additional construction noise impacts. • To ensure the effectiveness of proposed operational noise mitigation measures, the Department has recommended the Proponent undertake additional background noise monitoring, review the traffic noise model and mitigation measures during detailed design, and undertake operational noise validations within twelve months and at five years after opening of the project to traffic.

Traffic and transport

Construction

- Concern over the access arrangements to construction ancillary facilities
- Concern over potential property access impacts
- Location of material haulage routes and local traffic congestion.

Operation

- Staged opening of the project with the Heatherbrae Bypass opening earlier than the remainder of the project
- Concern that there is no dedicated shared path along the viaduct
- Removal of the proposed on-ramp from the New England Highway to the new alignment at Tarro and the provision of a new on-ramp at Black Hill from Weakleys Drive to accommodate traffic generated from the Black Hill Industrial Precinct
- A full interchange at Masonite Road to be included to accommodate traffic to/from Port Stephens.

Assessment

- The project will provide a new motorway corridor between the M1 at Black Hill and the Pacific Highway at Raymond Terrace and will provide benefits across the traffic network through decreased travel times and increased reliability and network safety. The project would reduce pinch points in the regional road network by bypassing five sets of traffic lights between the intersection of the M1 Pacific Motorway / Weakleys Drive / John Renshaw Drive at Black Hill and the intersection of Pacific Highway / Hank Street at Raymond Terrace.
- The project has been designed in consideration of surrounding residents and the local environment and will provide a safer local road network through the transfer of traffic onto the motorway and off State roads used by locals to traverse the local suburbs of Beresfield, Tarro, Tomago, Hexham, Heatherbrae and Raymond Terrace.
- Construction traffic impacts are considered acceptable as the majority of construction traffic movements would be along the existing arterial road network, except for a few construction traffic movements associated with works at Anderson Drive, Tarro (which is a residential area) and haulage routes for quarry materials and plant and equipment coming from the north west via Woodbury Road and Adelaide Road which pass through the residential suburbs of Woodbury and Raymond Terrace. These heavy vehicle movements would need to transverse the residential areas since there are no alternatives to these routes and impacts would be managed through a suite of proactive traffic management measures.
- There is no provision for dedicated pedestrian or cyclist infrastructure along the viaduct. However, cycling opportunities would be provided along the entire length of the project, including the viaduct, using the road shoulders of the motorway alignment. The proposed motorway will include 2.5-3.0 metre wide sealed shoulders that cyclists can use. In addition, 2.5 metre wide sealed shoulders will be provided on the on/off ramps allowing for cyclists to enter and exit the motorway. A dedicated shared path has not been proposed due to the low pedestrian demand.
- The delivery of the project has been amended to a two-stage process to provide initial traffic benefits – Southern (Black Hill to Tomago) and Northern (Heatherbrae bypass) works. The Northern section would likely have a shorter construction duration and could be opened whilst construction of the crossing across the Hunter River is completed.

Recommended Conditions/Response

- Safe pedestrian and cyclist access must be maintained around construction sites, or an alternative route must be provided.
- Access to all properties must be maintained during construction, unless otherwise agreed with the landowner or occupier.
- The Proponent must seek the Department's approval to use local roads that were not identified in the EIS or Submissions Report.
- The future provision of a southern access point to the Emerging Black Hill Precinct is outside of the scope of this project approval. It is a matter for TfNSW, councils (City of Newcastle and Cessnock City Council) and other relevant stakeholders to resolve as the demand will be driven by precinct development.
- The Department understands that should staged opening of the project occur, elements of the project will be able to operate safely and efficiently ahead of the southern section of the project opening.

Flooding and hydrology • Concern that the project will increase flooding impacts (afflux) on adjoining properties and increase the duration of flood events • The need to design the project to provide flood-free access, noting that some parts of the carriageway and connecting ramps may be inundated in a 1% AEP flood event (i.e. a flood with a one in 100 chance of being exceeded in any one year)	*Assessment* • The project is located in the lower portion of the Hunter River catchment in NSW. The catchment area is comprised of a range of land uses including agricultural, industrial, commercial, residential and environmental conservation (wetlands and national parks). • The project's footprint intercepts waterways within the suburbs of Black Hill, Beresfield, Tarro, Heatherbrae, and Raymond Terrace. • The Hunter River Floodplain is a sensitive catchment, and any new development, structures, or landforms will impact on hydrology and flooding. • The proposed viaduct over the Hunter River will have flooding impacts, with the piers causing hydraulic energy losses to flood flows and reducing floodplain storage due to the number of piers within the floodplain. Modelling indicates that the new Hunter River viaduct will increase existing flood levels upstream of the project for all flood events up to and including the 1% annual exceedance probability (AEP) event by between 0.01 to 0.02 metres. • The Department engaged Bewsher Consulting to undertake an independent and expert peer review of the flooding assessment (Appendix H). *Recommended Conditions/Response* • Quantitative design limits (QDLs) have been recommended aimed at minimising flood impacts beyond those proposed by the Proponent. • Additional flood modelling and property surveys will be required to confirm the properties that will experience increased above floor level flooding as a result of the project. • Where QDLs cannot be met, mitigation measures need to be implemented with the agreement of the impacted landowner. • An Independent Flood Impact Advisory Panel is to be established, to aid in dispute resolution on the type of mitigation measures provided to offset flood impacts on property owners.
Social, economic, land use and property • Concern of exacerbation of health and social impacts for communities • Impacts of the construction footprint on operation of the Muree Golf Club • Bypass impacts on businesses in Heatherbrae and Raymond Terrace.	• The project will provide local and regional economic benefits through improved amenity in town centres and local access due to traffic being removed from State and regional roads. It would also improve access to key employment areas such as Beresfield, Black Hill, Tomago and the Port of Newcastle for residents and workers in the region. However, it will remove through traffic from the New England Highway and Pacific Highway resulting in less passing trade for local businesses. To address this loss, the Proponent will implement a signage plan that highlights the local centres and departure points to these from the new motorway. • As with all major road projects, there will be direct impacts on some individuals, particularly those who will be affected by land acquisition. Approximately 43 per cent of properties directly located within the construction footprint are currently owned by the Proponent, with the remaining property acquisitions / property adjustments to be carried out in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991*. • The Proponent clarified that the construction footprint does not impact any land owned by Muree Golf Club.

	Recommended Conditions/Response • The Proponent has committed to develop a Directional Signage Plan in accordance with Transport for NSW signage policy. This Plan will be developed, in consultation with stakeholders (typically businesses that associate with passing trade customers), to facilitate signposting for key locations along the project. The signage would inform the travelling public about services in Beresfield and Heatherbrae to promote departure from the highway and continued patronage of local business by Pacific Highway motorists. • To ensure employment and training targets relating to diversity are realised during the construction of the project, the Department has conditioned ongoing reporting by the Proponent throughout construction against the objectives for economic participation and capacity building of Aboriginal people and diversity and gender equity in the workforce.
<u>Biodiversity</u> • Concern regarding the project's impact on local wildlife (particularly Koalas), habitats, and fauna movement corridors	*Assessment* • The project will have direct and indirect impacts to threatened ecological communities and threatened species listed under the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In particular, it will impact on potential foraging habitat of the Koala (around 89.1 hectares) which is listed as Vulnerable under the TSC Act and EPBC Act and of the Australasian Bittern (around 43.7 hectares) which is listed as Endangered under the TSC Act and EPBC Act. • The credits required to offset the residual impacts of the project have been calculated using the BioBanking Assessment Methodology and include 8,111 ecosystem credits and 22,242 species credits. • The project would also impact around 16.1 hectares of coastal wetlands mapped under State Environmental Planning Policy (Resilience and Hazards) 2021, including about 3.6 hectares of the saltmarsh and mangrove communities. *Recommended Conditions/Response* • The approval requires the Proponent to retire ecological and species credits to offset residual impacts to biodiversity values once all measures have been implemented to avoid and/or reduce impacts. The offsets must be retired in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*, and may include biodiversity stewardship agreements, management of land added to the National Parks estate and supplementary measures. • Offsets for the 3.6 hectares of saline vegetation communities would be provided in accordance with the *Policy and Guidelines for Fish Habitat Conservation and Management - Update 2013* (DPI Fisheries NSW) as the project has been assessed under the *Framework for Biodiversity Assessment*.

Appendix F – Assessment of EPBC Act listed threatened species and communities

Assessment of EPBC Act-listed threatened species and communities for projects
Suggested information for inclusion in the advice to DPE

M1 Pacific Motorway extension to Raymond Terrace Project (SSI 7319) EPBC Bilateral Assessment – BCD Assessment (EPBC 2018/8288)

All section, table, figure and appendix references in this document (below) refer to sections, tables, figures and appendices in the Biodiversity Assessment Report (BAR) (dated April 2021) submitted with the Transport for NSW (TfNSW) M1 Pacific Motorway Extension to Raymond Terrace Environmental Impact Statement (EIS), and additional information provided during the Response to Submissions, including a revised BAR (dated June 2022).

Note: This is Version 2 with all recommendations / queries addressed by TfNSW via revised BAR (sent on 4 July 2022).

1. Background & Description of Action

Does the EIS/BAR[3]:

☒ clearly show how operational and construction footprints, including clearing boundaries, structures to be built and elements of the action are situated with regard to MNES

☒ depict stages and timing of the action that may impact on MNES

☒ provide a map(s) of the subject land boundary showing the final proposal/disturbance footprint with respect to location of MNES, including GIS shape files

Provide advice on the adequacy of the background and action description with respect to MNES and identify any recommended additional information requirements:

TfNSW proposes to construct the M1 Pacific Motorway extension from Black Hill to Raymond Terrace (the project). Approval is sought under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979* and Part 9, Division 1 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The project has also been declared a controlled action under section 75 of the EPBC Act (reference EPBC 2018/8288) for its likely significant impacts to threatened species and communities (Section 18 and Section 18A of the EPBC Act). As such, the project requires approval from the NSW Department of Planning and Environment (DPE) and the Commonwealth Government, Department of Climate Change, Energy, the Environment and Water (DCCEEW) previously Department of Agriculture, Water and Environment (DAWE).

A description of the project is provided in Section 1.2 of the BAR. The project will connect the existing M1 Pacific Motorway at Black Hill to the Pacific Highway at Raymond Terrace with dual carriage motorway. The project lies within the City of Newcastle and Port Stephens Council local government areas (LGAs). A more detailed description is presented in Appendix A of the *M1 Pacific Motorway Extension to Raymond Terrace Submissions Report* (TfNSW 2022). The locality of the project is shown in Figure 1 1 of the BAR. GIS shapefiles including the final proposal and disturbance footprint in relation to MNES were provided directly to the Biodiversity Conservation Division (BCD) of the DPE.

The project will include the following key features:

- A 15 kilometre (km) motorway comprised of a four lane divided road (two lanes in each direction),
- Motorway access from the existing road network via four new interchanges at:
  - Black Hill: connection to the M1 Pacific Motorway,

[3] Bilateral agreement (BLA) made under section 45 of the EPBC Act, including Amending Agreement No. 1 (2020).

[3] Or revisions of the BAR and associated documentation made as a result of previous reviews or project changes post-exhibition

    - Tarro: connection and upgrade (six lanes) to the New England Highway between John Renshaw Drive, and the existing Tarro interchange at Anderson Drive,
    - Tomago: connection to the Pacific Highway and Old Punt Road, and
    - Raymond Terrace: connection to the Pacific Highway.
- A 2.6 km viaduct over the Hunter River floodplain including new bridge crossings over the Hunter River, the Main North Rail Line and the New England Highway,
- Bridge structures over local waterways at Tarro and Raymond Terrace, and an overpass for Masonite Road in Heatherbrae,
- Connections and modifications to the adjoining local road network,
- Traffic management facilities and features,
- Roadside furniture including safety barriers, signage, fauna fencing and crossings and street lighting,
- Adjustment of waterways, including at Purgatory Creek at Tarro and tributary of Viney Creek,
- Environmental management measures including surface water quality control measures,
- Adjustment, protection and/or relocation of existing utilities,
- Walking and cycling considerations, allowing for existing and proposed cycleway route access,
- Permanent and temporary property adjustments and property access refinements, and
- Construction activities, including establishment and use of temporary ancillary facilities, temporary access tracks, haul roads, batching plants, temporary wharves, soil treatment and environmental controls.

Although the *Threatened Species Conservation Act 1995* (TSC Act) was replaced by the *Biodiversity Conservation Act 2016* (BC Act), the assessment of the biodiversity values of the project have been undertaken under the TSC Act as the project is a pending planning application under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*. The project was assessed by DPE under the Framework for Biodiversity Assessment (FBA) utilising the Biobanking Assessment Methodology (BBAM), including the BBAM-C (credit calculator) to produce a BAR. BCD's review of the project EIS and the BAR concluded that the FBA assessment was adequate and any issues it raised were adequately addressed at the Response to Submissions phase.

BCD considers the BAR adequately describes the project that includes: (i) operational and construction footprints, (ii) structures to be built, (iii) elements of the action in relation to MNES, and(iv) stages and timing of the action that may impact on MNES.

Overview of MNES biodiversity impacts

The project was determined to be a controlled action based on its potential to impact on the following MNES:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland threatened ecological community (TEC) – endangered under the EPBC Act. Although ultimately this TEC was not detected in the development footprint. PCT 1727: Swamp Oak - Sea Rush - Baumea juncea swamp forest on coastal lowlands of the Central Coast and Lower North Coast was confirmed and mapped in the construction footprint but it does not meet the listing criteria for the Commonwealth listed TEC of the similar name. Section 5.4.2 of the BAR provides details on why it is not considered the TEC.
- Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) – endangered[4] under the EPBC Act
- Swift Parrot (*Lathamus discolor*) – critically endangered under the EPBC Act
- Regent Honeyeater (*Anthochaera phrygia*) – critically endangered under the EPBC Act
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable under the EPBC Act.

The referral to DCCEEW determined that significant impacts would be unlikely for Earp's Gum (*Eucalyptus parramattensis* subsp. *decadens*), Small-flowered Grevillea (*Grevillea parviflora* subsp. *parviflora*), Tall Knotweed (*Persicaria elatior*), Australasian Bittern (*Botaurus poiciloptilus*), Australian Painted Snipe (*Rostratula australis*), Spotted-tailed Quoll (*Dasyurus maculatus*), New Holland Mouse (*Psuedomys novaehollandiae*) and Green and Golden Bell Frog (*Litoria aurea*). Additionally, the project would result in the following residual biodiversity impacts on MNES and TSC Act:

- Removal of about 0.63 (ha) of Subtropical and Temperate Coastal Saltmarsh TEC listed under the EPBC Act; and the removal of about 173.81 ha of native vegetation of which 136.08 ha correspond with six threatened ecological communities listed under the TSC Act.

[4] At the time of controlled action decision, 14 January 2019, the Koala was listed as vulnerable under the EPBC Act.

- Removal of the following threatened plant species:
  - *Callistemon linearifolius* (*Biodiversity Conservation Act 2016* [the BC Act] listed) – about 159 plants
  - *Diuris arenaria* (BC Act listed) – about 206 plants
  - *Eucalyptus parramattensis* subsp. *decadens* – an EPBC Act listed species (also on BC Act) – about 34 plants
  - *Persicaria elatior* – an EPBC Act listed species (also on BC Act) – about three plants.
- Impacts to habitat of five species credit fauna species.
- Loss of habitat for 35 ecosystem credit threatened fauna species (nine recorded and 26 assumed present), including loss of hollow-bearing trees, loss of foraging resources and reduction in habitat area.
- Removal of 89.1 ha of vegetation types that contains koala feed tree species.
- Minor fragmentation of native vegetation and habitat at three locations; Black Hill, Tomago and Heatherbrae.
- Localised disturbance and loss of riparian habitat along the banks of the Hunter River during construction and operation of the new bridge.
- Temporary impacts to Key Fish Habitat during construction of the bridge over the Hunter River.

The series of figures provided as Figure 4-3 show the location of MNES (threatened species) in relation to the project footprint. There are no Endangered Ecological Communities (MNES), except for a very minor impact to the Saltmarsh community (vulnerable). A detailed assessment of the impact, including associated construction activities and staging of works, of the Project on MNES is provided in Section 8.3 of the BAR.

GIS shapefiles have been provided to BCD/DPE by TfNSW that represent MNES matters.

2. Landscape Context of the MNES

Provide advice on the adequacy of the landscape context information and identify any additional information requirements:

Landscape context that addresses the FBA is documented mainly in Section 2 of the BAR, and includes:

- The area of clearing, which is 173.81 ha, is not described or listed under section 2 of the BAR but is consistently mentioned / listed throughout. It is first mentioned in Section 3.2 (Plant Community Types), with respect to the total area of native vegetation that is to be cleared. However, the area to be cleared (173.81 ha) is not consistent with the Credit Profile Reports (Summary of ecosystem credits required) in Appendix C. The Summary indicates 174.25 ha is to be cleared. This will need to be explained.

Initial Review noted:
RECOMMENDATION: There is an inconsistency for the area to be cleared between the BAR, which states the area to be cleared is 173.81 h) compared to the Credit Profile Reports (Summary of ecosystem credits required) from the BBAM-C in Appendix C, which states the area to be cleared is 174.25 ha. The assessor needs to advise of the correct value, provide justification and amend the BAR and BBAM-C as required.
RESPONSE: TfNSW updated the BAR and BAM-C (Credit Profile Report) with correct figure – 173.81 ha; justification provided in Section 8 (Recommendations) of this Bilateral Report (based on Revised BAR (received 4 July 2022).

- The project is assessed as a 'linear assessment'.
- Two IBRA regions are applicable to the project (as per Section 2.1.2); and they are the Sydney Basin Bioregion (majority of the construction footprint from Black Hill to Tomago) and the NSW North Coast Bioregion (from Tomago to Heatherbrae). The project is primarily located within the Hunter subregion of the Sydney Basin Bioregion as defined by Thackway and Cresswell (1995).
- The project is located across three Mitchell (NSW) Landscapes as mapped by the NSW National Parks and Wildlife Service (2002)(as per Section 2.2.2): (i) Newcastle Coastal Ramp, (ii) Lower Hunter Channels and Floodplains, and (iii) Sydney – Newcastle Barriers and Beaches. These Mitchell landscapes are shown in Figure 2 1 of the BAR.
- Section 2.2.3 indicates it traverses the Hunter River and associated floodplain near Hexham. In addition to the Hunter River, the project will cross several mapped waterways including: Tributary of Viney Creek, "Glenrowan Creek" (Note: this creek is an unnamed tributary and is referred to as Glenrowan Creek in this

assessment for ease of interpretation only), Purgatory Creek and Windeyer's Creek. Stream Order is listed in Table 4.11 (Table 4 11 Summary of aquatic habitat assessment at monitoring sites).

- Information and assessment on wetlands is located in Section 2.2.4.
- Section 2.3.1 details native vegetation extent. Pre-development native vegetation cover in the landscape buffer is estimated at 1,277 ha (43.79 per cent), whereas the post-construction native vegetation cover (i.e., the cover of native vegetation within the landscape buffer after the completion of vegetation clearing associated with the construction of the project) is estimated at 1,103 ha (37.48 per cent) (refer to Table 2 3). The per cent native vegetation cover in the landscape buffer would therefore be reduced by about 6.31 per cent after the completion of the development. This would take it down one cover category (as defined by the FBA) from between 31 and 45 per cent down to between 36 and 40 per cent.
- For a linear shaped development, a connecting link occurs when native vegetation on the site adjoins native vegetation surrounding the site and the native vegetation. A riparian buffer of a 6th order stream or greater is the described in Section 2.2.2 as the main link.
- Patch size is described in Section 2.3.3 and has been correctly applied to all three Mitchell Landscapes; and the area to perimeter ration is described in Section 2.3.4.
- A summary of the landscape value assessment is provided in Section 2.3.5, with the total landscape value score of 27.2 based on the following component scores:
    - Per cent native vegetation cover = 1.0 (reduction from 9.5 to 8.5)
    - Connectivity value class = 12.5
    - Average patch size score = 11.7
    - Proportional change in area to perimeter ratio (score) = 2.0.

BCD confirms that details on landscape context have been undertaken in accordance with the FBA, and the landscape assessment meets the requirements of Stage 1: Part 1 'Assessing landscape features' of the FBA (*BioBanking and the Framework for Biodiversity Assessment Operational Manual* (OEH, 2016).

3. EPBC Act Listed Threatened Species & Communities

Verify that the EIS/BAR includes relevant information on the identification of all EPBC Act listed threatened species and communities on the site or in the vicinity[5] via:

☒ field based survey effort

☒ published peer reviewed literature

☐ local data

☒ supporting databases (such as the NSW BioNet Vegetation Classification, NSW BioNet Threatened Biodiversity Data Collection, NSW BioNet Atlas, Commonwealth Species Profile and Threats Database search results)

☒ verify that the EIS/BAR includes appropriate mapping of all EPBC Act listed threatened species and communities in accordance with the relevant Commonwealth Listing Advice. The EIS/BAR should include important populations and critical habitat as defined in Approved Listing Advice, Approved Conservation Advice and Recovery Action Plans.

BCD has provided a summary of the impacted MNES communities and species in Section 1 of this document. The project was determined to be a controlled action based on its potential to impact on the following MNES entities: (i) Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community, (i) Koala, (iii) Swift Parrot, (iv) Regent Honeyeater, and (v) Grey-headed Flying-fox. Additionally, other EPBC listed species were located in the development footprint, but a significant impact was assessed as unlikely, they include Earp's Gum, Small-flowered Grevillea, Tall Knotweed, Australasian Bittern, Australian Painted Snipe, Spotted-tailed Quoll, New Holland Mouse and Green and Golden Bell Frog.

Additionally, the project would result in the removal of about 0.63 ha of Subtropical and Temperate Coastal Saltmarsh TEC.

[5] On land to which impacts may extend.

Provide advice on the adequacy of the identification methods and mapping information / any additional information requirements:

BCD confirms that surveys for MNES species have been done in accordance with Stage 1: Part 2 'Assessing native vegetation' and Stage 1: Part 3 'Assessing threatened species and populations' of the FBA. Section 3.1 of the BAR describes method in relation to 'assessing native vegetation' and Section 4.1 describes methods for 'assessing threatened species and populations'.

BCD notes that surveys must also be done in accordance with Commonwealth survey requirements (if available, and if so, they must be referenced). The BAR references the following Commonwealth survey guidelines:

- *Survey Guidelines for Australia's Threatened Orchids: Guidelines for Detecting Orchids Listed as 'Threatened' under the Environmental Protection and Biodiversity Conservation Act 1999* Department of Environment, 2013) - orchid surveys were also guided by these guidelines (as per Section 4.2.1 – Threatened Plants).
- Threatened bats – *Survey Guidelines for Australia's Threatened Bats, Commonwealth of Australia (2010)* http://www.environment.gov.au/epbc/publications/threatened-bats.html (as per Section 4.2.2 – Threatened Fauna).
- Threatened birds – *Survey Guidelines for Australia's Threatened Birds, Commonwealth of Australia (2010)* http://www.environment.gov.au/system/files/resources/107052eb-2041-45b9-9296-b5f514493ae0/files/survey-guidelines-birds.pdf ((as per Section 4.2.2 – Threatened Fauna).
- Threatened frogs – *Survey Guidelines for Australia's Threatened Frogs, Commonwealth of Australia (2011)* http://www.environment.gov.au/system/files/resources/ff3eb752-482d-417f-8971-f93a84211518/files/survey-guidelines-frogs.pdf (as per Section 4.2.2 – Threatened Fauna)

Searches from supporting databases are listed in Section 3.1.1 and Section 4.1.1. Findings were used to inform Section 3 and Section 4 of the BAR, such as NSW BioNet Vegetation Classification, NSW BioNet Threatened Biodiversity Data Collection, NSW BioNet Atlas, Commonwealth Species Profile and Threats Database search results. Although the *Protected Matters Search Tool* (PMST; Department of the Environment (2016) http://www.environment.gov.au/epbc/pmst/index.html) is referenced it should be provided as an Appendix to the BAR.

Initial Review noted:
RECOMMENDATION: The output from the *Protected Matters Search Tool* should be provided as an Appendix of the BAR.

RESPONSE: TfNSW provided the *Protected Matters Search Tool* output as Appendix L of the BAR (based on Revised BAR, received on 4 July 2022).

The series of figures provided as Figure 4-3 show the location of MNES (threatened species) in relation to the project footprint.

BCD's initial review of the EIS (dated 30 August 2021; DOC21/629824-57) requested further details on the survey effort and timing for the following EPBC listed species:

- Flora - *Asperula asthenes*, *Cryptostylis hunteriana*, *Diuris praecox*, *Grevillea parviflora* subsp. *parviflora* and *Rutidosis heterogama*.
- Fauna: gang-gang cockatoo.

TfNSW Response of Submissions document (dated April 2022, including a Revised BAR which is dated June 2022) provided further clarification of the above surveys to the satisfaction of BCD. No other issues were identified within the BAR with respect to surveying.

No expert reports were used in the BAR; and nor did the BAR assume presence for any MNES species or ecological community. Local data for Plant Community Types (PCT) benchmark scores was not used, as the BAR relies on the benchmark scores in the Vegetation classification database for each of the PCTs assessed. The BAR relied on threatened species profiles, Atlas and PMST as per FBA requirements (as detailed in Section 3.1.1 and Section 4.1.1).

BCD confirms there are numerous citations referring to MNES matters throughout the BAR and a full list of the references cited are listed at the end of the BAR in a Section titled 'References'. No obscure references have been provided, although some are flora and fauna assessments from local / nearby developments which may be difficult to obtain. BCD recommends that if these are required, they are requested from TfNSW.

Appropriate mapping of all EPBC Act-listed species and communities in accordance with relevant Commonwealth Listing Advice:

TEC:

(i) *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland*

Although the project was determined to be a controlled action partly on the basis for this project to impact on the Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland TEC, this TEC was found not to be present in the development footprint. Although PCT 1727: *Swamp Oak - Sea Rush - Baumea juncea swamp forest on coastal lowlands of the Central Coast and Lower North Coast* was confirmed and mapped in the construction footprint, it does not meet the listing criteria for the Commonwealth listed TEC of the similar name. Section 5.4.2 of the BAR provides details on why it is not considered the TEC.

In accordance with the condition thresholds, small patches require greater than 80 per cent native midstorey species. Plot 13 was carried out at a small patch within the construction footprint (refer to Table 5-1), which had only about 67 per cent native midstorey and does not meet the condition criteria. The largest patch of Coastal Swamp Oak close to the construction footprint is about 25 ha in area, consisting of three contiguous patches and occurs on the southern side of the Hunter River, from the river bend to the north east where the floodplain has been cleared (refer Figure 3-1). In accordance with the condition thresholds large patches require greater than 20 per cent native midstorey species. Three plots (Plot 43, 45 and 46) were carried out in this patch (refer to Table 5-1), which recorded between 0.1 per cent and nine per cent native midstorey species and did not meet the condition criteria. Whilst the project referral identified this community as potentially occurring on a precautionary basis, the subsequent review and analysis of the field data conducted for this biodiversity assessment indicates that, none of the occurrences of PCT 1727 within the construction footprint are of sufficient size or condition to meet the eligibility for the listed Coastal Swamp Oak Forest TEC. Refer to Table 5-1 '*Proportion of native and non-native midstorey species in PCT 1727 vegetation plot*' for a summary of this information.

(ii) *Subtropical and Temperate Coastal Saltmarsh*

Additionally, the project will result in the removal of about 0.63 ha of Subtropical and Temperate Coastal Saltmarsh TEC.

BCD confirms that the mapping of PCTs that are MNES is done in accordance with Section 1.3 'Relationship to the *Environment Protection and Biodiversity Conservation Act 1999*' of the *BioBanking Assessment Methodology 2014* (OEH, 2014). Figure 3.1 (maps 1 to 5) show the Plant Community Types, their condition and vegetation survey locations across the development footprint; whilst Figure 3.2 (maps 1 to 5) shows the Threatened Ecological Communities. The PCTs are described in detail, including appropriate justification to their assignment, in Section 3.2 (Plant Community Types).

Mapping of MNES that are ecosystem credit species has been done in accordance with Part 2 'Assessing native vegetation' in the FBA; whilst mapping of MNES that are species-credit species has been done in accordance with Part 3 'Assessing threatened species and populations' of the FBA. MNES that are species and ecosystem species credits are identified in Table 8-2. Furthermore, species polygons have been mapped for MNES, namely Figure 8-2 for Koala, and Figure 8-3 for Australasian Bittern.

Any important populations and critical habitat, as defined in Approved Listing Advice, Approved Conservation Advice and Recovery Action Plans:

There is no critical habitat listed for this project.

The definition of an important population as provided in the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (DoE 2013) is a "*… a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:*

- *Key source populations either for breeding or dispersal*
- *Populations that are necessary for maintaining genetic diversity, and/or*
- *Populations that are near the limit of the species range*".

Appendix D: Assessment of Significance (EPBC) provides a detailed assessment of whether or not records of EPBC listed species within the development footprint would be considered as an important population under the MNES guidelines. In most cases the assessment concluded that records of threatened flora or fauna did not constitute an important population (e.g., *Eucalyptus parramattensis* subsp. *decadens* and *Persicaria elatior*). However, the BAR implies (Appendix D) that the koala population / records on site would be part of an important population, as it is recognised that the northern part of the development footprint occurs within the Port Stephens Council LGA, and that this area is noted for one of the largest coastal populations of koala in eastern Australia. As such the proposed action has been designed to avoid and minimise the loss of mature eucalypt forest that could be used by koalas by passing as close to the existing Pacific Highway from Tomago to Heatherbrae where possible, and by flanking the edge of forest in this location, it thereby avoids fragmentation and potential impacts to movements of koalas. In this way, it is evident that the project will sit on the furthest western edge of the large expanse of habitat that exists from Tomago through to Tilligerry, Williamtown and Grahamstown Dam that is available to Koalas. This outcome will minimise disturbance associated with the loss of koala habitat and movement of koalas in Port Stephens.

In general, the importance of the koala population is discussed in the Assessment of Significance (Appendix D) and a species polygon was produced (Figure 8-2 Koala species polygon (map 1 of 2)) to determine the appropriate 'species credits' obligation for the project.

Confirm that all EPBC Act listed threatened species and communities that occur on the subject land, or in the vicinity, have been identified in the BAR/EIS including those that are ecosystem credit species.

The following extract was taken from the Commonwealth's referral decision letter (EPBC Ref: 2018/8288; dated 14 January 2019) for the proposed M1 Motorway Extension to Raymond Terrace (NSW) project which provides the following list of MNES considered by the Commonwealth that are likely to be, or may be significantly impacted by the project:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community (endangered), due to clearing and fragmentation of the community and of habitat critical to the survival of the community.
- Koala (*Phascolarctos cinereus*) (combined populations of Old, NSW and the ACT), listed as vulnerable, due to adverse impacts to habitat critical to the survival of the species and an important population.
- Swift Parrot (*Lathamus discolor*, critically endangered), Regent Honeyeater (*Anthochaera phrygia*, critically endangered) and Grey-headed Flying-fox (*Pteropus poliocephalus*, vulnerable), due to the removal of key foraging resources which are habitat critical to the survival of these species.

The proponent also added the following EPBC listed species for assessment, as they were located in or within close proximity to the development footprint: - Earp's Gum (*Eucalyptus parramattensis* subsp. *decadens*), Small-flowered Grevillea (*Grevillea parviflora* subsp. *parviflora*), Tall Knotweed (*Persicaria elatior*), Australasian Bittern (*Botaurus poiciloptilus*), Australian Painted Snipe (*Rostratula australis*), Spotted-tailed Quoll (*Dasyurus maculatus*), New Holland Mouse (*Psuedomys novaehollandiae*) and Green and Golden Bell Frog (*Litoria aurea*). However, the project was assessed as not having a significant impact on these listed species based on the Assessment of Significance undertaken in Appendix D of the BAR. However, impacts to these species have contributed to the offset requirements of biodiversity credits (both ecosystem and species credits) which are outlined in Section 10 - Offset Requirements. BCD confirms the BBAM-C (credit calculator) has been used in accordance with the FBA to generate the appropriate quantum of biodiversity credits for the impact of the project.

Additionally, the project would result in the removal of about 0.63 ha of Subtropical and Temperate Coastal Saltmarsh TEC.

The BAR has assessed MNES Coastal Swamp Oak TEC and determined it to be absent based on addressing the listing criteria and comparison with field plot data and GIS.

A detailed assessment of threatened species for all species, including those listed as likely to be significantly impacted upon are provided in Section 8.3 and Appendix D and Appendix E.

If any species and communities identified in the referral documentation (provided by DCCEEW) have been ruled out because they don't occur on or near the site, verify that there is robust analysis and justification for why these species can be ruled out.

Appendix B of the BAR provides an assessment of the likelihood of occurrence for all MNES identified in the PMST and the referral decision brief. Appropriate justification for inclusion or removal from assessment has been provided in Appendix B, Table B-2 (Likelihood of occurrence for EPBC Act listed threatened flora species) and Table B-3 (Likelihood of occurrence for EPBC Act listed threatened fauna species) based on decision criteria provided in Table B-1 (Likelihood of occurrence criteria) which looks at habitat suitability and potential distribution.

All species considered to be likely significantly impacted upon by the proposal (as per the referral decision brief) have been appropriately surveyed for (including targeted surveys), further assessed (as per Appendix D) and appropriately offset through the provision of biodiversity credits, details to which are provide within the Project's Biodiversity Offset Strategy (BOS).

Only Coastal Swamp Oak TEC (from the referral decision brief) was determined to be absent based on PCT 1727: *Swamp Oak - Sea Rush - Baumea juncea swamp forest on coastal lowlands of the Central Coast and Lower North Coast* not meeting the listing criteria for the Commonwealth TEC. This was based on comparison of field plot data and GIS against the Commonwealth TEC criteria thresholds.

Additional species and a small area of Subtropical and Temperate Coastal Saltmarsh TEC was included in the assessment, as previously discussed above.

DCCEEW suggests that a copy of the 'referral decision brief' should be included as part of the MNES assessment. The current BAR does not include this documentation.

Initial Review noted:
RECOMMENDATION: The BAR be revised to include a copy of the EPBC Referral Decision Brief for the project (EPBC Ref: 2018/8288; dated 14 January 2019).

RESPONSE: TfNSW provided the *EPBC Referral Decision Brief for the project (EPBC Ref: 2018/8288; dated 14 January 2019)* as Appendix M of the BAR (based on Revised BAR, received on 4 July 2022).

Provide advice on whether there are any other MNES species or communities that are missing from the assessment based on BCS knowledge and experience.

No MNES was added by BCD following a review of BioNet records, project reports, or peer-reviewed publications.

Advise whether there is appropriate justification and supporting evidence for the addition and/or exclusion of any EPBC Act listed threatened species and/or communities from the list (if applicable):

Section 5 of the BAR identifies the list of communities and species that were listed by the Commonwealth in the SEARs, and the species identified by the Commonwealth (as per their referral decision brief) were deemed to be present and a significant impact was considered likely are also assessed is Section 5 and Appendix D of the BAR.

Assessment of Significance of MNES species:

The project was determined to be a controlled action based on its potential to impact the following MNES species, which have been assessed appropriately in Appendix D of BAR. This provides a robust discussion, with data and analysis for the exclusion or addition or MNES in the BAR compared to the Commonwealth's decision referral brief. A summary of this assessment for each species is provided below:

- Koala (*Phascolarctos cinereus*):

  It is recognised that the northern part of the proposed action occurs in Port Stephens Council LGA, and that Port Stephens is noted for one of the largest coastal populations of Koala in eastern Australia.

  There are about 2000 historical Koala records within a 10 km radius of the proposed action. The majority of these are located on the northern side of the Hunter River in the Port Stephens Council LGA and associated with the large contiguous forests to the east of the existing Pacific Highway at Heatherbrae through to Tomago Road and also to the north of Raymond Terrace surrounding Grahamstown Dam, well outside the project disturbance area.

  Three primary feed tree species were identified within the survey area: Swamp Mahogany (E*ucalyptus robusta*), Forest Red Gum (*Eucalyptus tereticornis*) and Drooping Red Gum (*Eucalyptus parramattensis subsp. decadens*). Two secondary Koala feed tree species were also identified: Grey Gum (*Eucalyptus punctata*) and Red Mahogany (*Eucalyptus resinifera*).

  Habitat for the Koala is widespread to the east and south of the existing Pacific Highway near the proposed action. The existing Pacific Highway presents a significant barrier for potential northern movements and dispersal by Koala. The proposed action is not predicted to sever any important link for Koalas in the landscape.

  BCD's review of the EIS and original BAR (DOC21/629824-57; dated 31 August 2021) recommended the accredited assessor should reassess the impacts of the Project on the koala population in the western part of the development footprint (i.e., Black Hill / Beresfield) or provide further justification as to why this area is not considered to be suitable koala habitat. This was based on recent records (NSW BioNET) of koalas in the Black Hill / Beresfield section of the Project, which indicated a number of records from the Black Hill area and surrounds, dating from 2015, 2010 and 2006. These records were recorded from vegetation which is generally contiguous with the project footprint at Black Hill. BCD considered approximately 40 ha of PCT 1590 (Spotted Gum – Broad-leaved Mahogany – Red Ironbark shrubby open forest) and PCT 1588 (Grey Ironbark – Broad-leaved Mahogany – Forest Red Gum shrubby open forest on Coastal Lowlands of the Central Coast) in Black Hill / Beresfield area represented suitable koala habitat. The proponent's Response to Submissions report (June 2022) concurred with BCD position and reinstated the 40 ha of Koala habitat in the Beresfield / Black Hill area for assessment. The BAR and the BBAM-C have been updated, including the species credit requirements for this area.

  Conclusion: The proposed action has been designed to avoid and minimise the loss of mature forest by running as close as possible to the existing Pacific Highway from Tomago to Heatherbrae and also by flanking the edge of the forest in this location. However, the proposed action would remove 89.1 ha of Koala habitat and feed tree species, including the isolation of a further 5.3 ha of Koala habitat which would likely result in an adverse effect to Koala habitat critical to the survival of this species as defined by DoE (2013) *MNES: Significant impact guidelines 1.1 under the EPBC Act*.

  BCD concurs that the proposal is likely to significantly impact the koala through the removal of habitat, however, under the State assessment process this is being offset by the retirement of 'species' credits for the Koala, specifically for the 89.1 ha of core foraging habitat. Additionally, a number of the ecosystem credits to be retired would also account for secondary browse trees and movement habitat.

  Scattered Koala records show that the Port Stephens Koala population does extend across the northern part of the construction footprint on both sides of Masonite Road. It is evident, however, that the proposed action would have a minimal impact to the population in terms of absolute habitat loss and impacts to

movements of the species. Clearing as part of other developments in the area are also likely to reduce the likelihood of the proposed action causing fragmentation. There are current opportunities for Koalas to cross the existing Pacific Highway to the immediate north of the proposed action and the construction footprint does not isolate a significant area of habitat or disrupt apparent important landscape links for this species. Fauna connectivity and management measures have been prepared as part of the BAR (see Chapter 9) for the proposed action, which identifies additional measures to ensure that Koalas do not enter the road corridor and that suitable connectivity is provided where movement opportunities may occur.

Given the position of the proposed action, the findings from the background review, spatial review and field surveys, and the outcomes of the Assessment of Significance, the proposed action will significantly impact the Koala. Significant residual impacts have been offset utilising the BBAM-C and details of the biodiversity credit obligation is provided in Section 10 (Offset Requirements) of the BAR and Appendix C: Biodiversity Credit Report (from the BBAM-C).

- Swift Parrot (*Lathamus discolor*):

  The Swift Parrot is considered likely to occur based on the presence of suitable winter foraging habitat. The construction footprint contains some potential foraging habitat for the Swift Parrot. While the habitat in the construction footprint is not optimal, the loss of potential feed trees would directly affect the species opportunity to feed in the area. However, the construction footprint is not considered a critical area for the Swift Parrot. The Swift Parrot may utilise trees in the construction footprint for foraging intermittently when no other suitable inland (i.e., box ironbark woodlands) or coastal resources (i.e., Spotted Gum and Swamp Mahogany forests) are available. The proposed action would remove about 81 ha of potential foraging habitat.

  The Swift Parrot does not breed in the construction footprint and the extent of habitat remaining in the construction footprint would provide sufficient resources to sustain future visitation, such that the proposed action is unlikely to lead to a long-term decrease in the size of the Australian population. A report and model on the distribution of important habitat in the lower Hunter region has not identified this area as important habitat (Birdlife Australia 2013).

  Conclusion: The proposed action would result in a small reduction in extent of foraging habitat. The proposed action is unlikely to reduce the population size of the Swift Parrot or decrease the reproductive success of this species. The proposed action would not interfere with the recovery of the Swift Parrot. After consideration of the factors above, an overall conclusion has been made that the proposed action is unlikely to result in a significant impact to the Swift Parrot and so no species credits are required. It is noted that impacts to habitat features and PCTs associated with the Swift Parrot have been addressed through offsetting of significant residual impacts to the PCTs consequent to clearing utilising the BBAM-C and details of the biodiversity credit obligation is provided in Section 10 (Offset Requirements) of the BAR and Appendix C: Biodiversity Credit Report (from the BBAM-C). Given the avoidance, mitigation measures and offsetting requirements set out in the EIS, RTS and conditions of approval, it is considered that impacts on Swift Parrot as a result of the project are acceptable.

- Regent Honeyeater (*Anthochaera phrygia*):

  The Regent Honeyeater is considered likely to occur based on the presence of suitable habitat and known winter-flowering food resources (approximately 82.1 ha). In 2011, the Regent Honeyeater's population was estimated with medium reliability at between 350 and 400 mature birds. The majority of these birds exist in the Bundarra-Barraba area and the Capertee Valley in NSW, and north- eastern Victoria. Mapped areas of important habitat also occur in the Cessnock-Kurri Kurri area. The impacts to around 81 ha of potential foraging habitat in the construction footprint are considered unlikely to lead to a long-term decrease in the size of the Regent Honeyeater population as the proposed action will not impact on the critical remaining strongholds of the species or an area of known important habitat for breeding or foraging.

  There is a discrepancy between in the BAR with respect to area of potential habitat for Regent Honeyeater, Table 4-10 (Threatened species survey results) in the BAR states 82.1 ha of potential habitat, which is based

on the area of the PCTs (and appears to be correct based on the areas for PCTs in Table 6-1) compared to Appendix D (Assessment of Significance EPBC) which states 81 ha.

Initial Review noted:
RECOMMENDATION: The discrepancy between the BAR (Table 4-10) and Appendix D of the BAR be updated with the correct area of potential habitat for the Regent Honeyeater, which appears to be 82.1 ha given the areas of the associated PCTs in Table 6-1 of the BAR.

RESPONSE: TfNSW has updated Appendix D with the correct area of 82.1 ha which corresponds with Table 4-10 of the BAR (based on Revised BAR, received on 4 July 2022).

The proposed action will not reduce the current area of occupancy for the Regent Honeyeater as there will be no impact to important mapped habitat areas.

Conclusion: The proposed action would result in a small reduction in the extent of potential non-breeding foraging habitat for this species. However, impacts are predicted to be minimal as this species is unlikely to use the construction footprint consistently. The proposed action is unlikely to reduce the population size of the Regent Honeyeater or decrease the reproductive success of this species. The proposed action would not interfere with and key breeding sites or foraging areas and will not interfere with the recovery of the Regent Honeyeater. After consideration of the factors above, an overall conclusion has been made that the proposed action is unlikely to result in a significant impact to the Regent Honeyeater and so no species credits are required. It is noted that impacts to habitat features and PCTs associated with the Regent Honeyeater have been addressed through offsetting of significant residual impacts to the PCTs consequent to clearing utilising the BBAM-C and details of the biodiversity credit obligation is provided in Section 10 (Offset Requirements) of the BAR and Appendix C: Biodiversity Credit Report (from the BBAM-C). Given the avoidance, mitigation measures and offsetting requirements set out in the EIS, RTS and conditions of approval, it is considered that impacts on Regent Honeyeater as a result of the project are acceptable.

- Grey-headed Flying-fox (*Pteropus poliocephalus*):

  The Grey-headed Flying-fox was identified in the survey area during the surveys. All forest and woodland habitat in the survey area is considered foraging habitat critical to the survival of the species. The Grey-headed Flying-fox exists as a single interconnected population in Australia. As such, it is considered an important population.

  There are no roost camps in the survey area or construction footprint and the proposed action will not impact on any known permanent roosting, breeding / maternity site. Therefore, it is likely that the impacts of construction and operation of the proposed action would be confined to loss of foraging resources caused by direct clearing or damage to native vegetation during the construction phase. There is also a low risk of vehicle strike during operation. The proposed action would directly remove up to 85 ha of potential foraging habitat. The affected area of foraging habitat would represent a small percentage of the total extent of important foraging vegetation types present within a 50 km radius of the proposed action and the five nationally important roost camps within a 50 km radius (Raymond Terrace two km from the proposed action, Carrington Mangroves 10 km from the proposed action, Blackbutt Reserve 12 km from the proposed action, Glen William 28 km from the proposed action and Cessnock 34 km from the proposed action). Given the relative widespread nature of similar native vegetation and planted vegetation in the locality and abundance of higher quality foraging habitat within the feeding range of regional populations, the proposed action is not expected to lead to a long-term decrease in the size of an important population.

  There is a discrepancy between in the BAR with respect to area of potential habitat for Grey-headed Flying-fox, Table 4-10 (Threatened species survey results) in the BAR states 83.4 ha of potential habitat, which is based on the area of the PCTs (and appears to be correct based on the areas for PCTs in Table 6-1) compared to Appendix D (Assessment of Significance EPBC) which states 85 ha.

Initial Review noted:
RECOMMENDATION: The discrepancy between the BAR (Table 4-10) and Appendix D of the BAR be updated with the correct area of potential habitat for the Grey-headed Flying-fox, which appears to be 83.4 ha given the areas of the associated PCTs in Table 6-1 of the BAR.

RESPONSE: TfNSW has updated Appendix D with the correct area of 83.4 ha which corresponds with Table 4-10 of the BAR (based on Revised BAR, received on 4 July 2022).

Conclusion: The Grey-headed Flying-fox will experience a small reduction in extent of suitable foraging habitat from the proposed action. No breeding camps or other important habitat will be impacted. The proposed action is unlikely to reduce the population size of the Grey-headed Flying-fox or decrease the reproductive success of this species. The proposed action will not interfere with the recovery of the Grey-headed Flying-fox and will not contribute to the key threats to this species. After consideration of the factors above, an overall conclusion has been made that the proposed action is unlikely to result in a significant impact to the Grey-headed Flying-fox and so no species credits are required. It is noted that impacts to habitat features and PCTs associated with the species have been addressed through offsetting of significant residual impacts to the PCTs consequent to clearing utilising the BBAM-C and details of the biodiversity credit obligation is provided in Section 10 (Offset Requirements) of the BAR and Appendix C: Biodiversity Credit Report (from the BBAM-C). Given the avoidance, mitigation measures and offsetting requirements set out in the EIS, RTS and conditions of approval, it is considered that impacts on Grey-headed Flying-fox as a result of the project are acceptable.

The proponent also added the following EPBC listed species for assessment, as they were located in or within close proximity to the development footprint: - Earp's Gum (*Eucalyptus parramattensis* subsp. *decadens*), Small-flowered Grevillea (*Grevillea parviflora* subsp. *parviflora*), Tall Knotweed (*Persicaria elatior*), Australasian Bittern (*Botaurus poiciloptilus*), Australian Painted Snipe (*Rostratula australis*), Spotted-tailed Quoll (*Dasyurus maculatus*), New Holland Mouse (*Psuedomys novaehollandiae*) and Green and Golden Bell Frog (*Litoria aurea*). However, the project was assessed as not having a significant impact on these listed species based on the Assessment of Significance undertaken in Appendix D of the BAR. However, impacts to these species have contributed to the offset requirements of biodiversity credits (both ecosystem and species credits) which are outlined in Section 10 - Offset Requirements.

BCD concurs with the BAR that a significant impact is unlikely for:

(i) Earp's (Drooping) Gum: a total of 34 *Eucalyptus parramattensis* subsp. *decadens* trees will be removed, however, these individuals are restricted to a small area of about five hectares on the edge of a large fragment of Swamp Sclerophyll and Open forest which is largely contiguous to the east towards Williamtown and therefore connected to the large Tomago Sandbeds sub-population of *E*. *parramattensis* subsp. *decadens*. It is unlikely the removal of the 34 plants will affect the viability of the local population, nor is it considered a key source population for breeding or dispersal, it is not a significant population for the maintenance of genetic diversity and the subject site is not near the limit of its geographical distribution (also occurs in the Kurri Kurri area).

(ii) Tall Knotweed – 3 *Persicaria elatior* plants will be removed. These plants were recorded in March 2018 following months of below average rainfall. The drainage line presents more suitable habitat for this species. There is potential for more individuals to show up following suitable rainfall, however the land has a long history of grazing and suppression of regrowth. There is no population information for *Persicaria elatior*, however the Species Profile and Threats Database (SPRAT) profile recognises Raymond Terrace as a general location in north-east NSW where it has been collected. Records of this species in the locality include a cluster of plants in pasture around Grahamstown drain seven km to the north-east and a single record from partly cleared sandy swamp forest between Heatherbrae and Williamtown, around 8.5 km east. Documented habitat for *Persicaria elatior* includes sandy, alluvial soil in swampy areas and riparian herb lands along watercourses and lake edges. This describes the likely habitat in sandy swamp forest between Heatherbrae and Williamtown. The extent of the local population likely includes large areas of swamp forest throughout the Tomago Sandbeds. As such it is highly likely the population is far greater than 3 plants and given the amount of suitable habitat, coupled with the broad occurrence of the species in the Raymond Terrace / Tomago area it is unlikely that a significant impact to the species will occur.

Nevertheless, under the FBA the removal of the Tall Knotweed and Drooping Gum plants generates species credits which will need to be retired as part of the offsetting process.

Similarly, the habitat of Australasian Bittern, which may be impacted will be adequately offset via biodiversity credits, as outlined in the BAR.

Grevillea parviflora subs. *parviflora* was detected on the edge of a small, isolated remnant patch of Spotted Gum-Ironbark forest (PCT 1590) at Tomago, but it was outside of the development footprint and as such it has been avoided. No impact will occur on this species.

The proponent has also assessed the removal of habitat for wetland and terrestrial migratory species listed under the EPBC Act, namely species such as Latham's Snipe, Rufus Fantail and Satin Flycatcher. Approximately 69 ha floodplain wetland (grazed) habitats and 70.5 ha terrestrial forest habitat represent suitable habitat for the migratory and wetland birds. As such impacts have been offset utilising the BBAM-C and details of the biodiversity credit (ecosystem) obligation is provided in Section 10 (Offset Requirements) of the BAR and Appendix C: Biodiversity Credit Report (from the BBAM-C).

Threatened Ecological Communities:

A robust discussion and analysis of the presence of listed ecological communities (MNES) is provided in Section 5 that address the listing advice and criteria for each community.

(i) *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland*

Although the project was determined to be a controlled action partly on the basis for this project to impact on the Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland TEC, this TEC was found not to be present in the development footprint. Although PCT 1727: *Swamp Oak - Sea Rush - Baumea juncea swamp forest on coastal lowlands of the Central Coast and Lower North Coast* was confirmed and mapped in the construction footprint, it does not meet the listing criteria for the Commonwealth listed TEC of the similar name. Section 5.4.2 of the BAR provides details on why it is not considered the TEC, and this reasoning is discussed previously above.

Although this TEC is not present within the development footprint, PCT 1727: *Swamp Oak - Sea Rush - Baumea juncea swamp forest on coastal lowlands of the Central Coast and Lower North Coast* is still representative if the State-listed endangered ecological community (EEC) under the BC Act – Swamp Oak Floodplain Forest EEC. As such impacts have been offset utilising the BBAM-C and details of the biodiversity credit obligation is provided in Section 10 (Offset Requirements) of the BAR and Appendix C: Biodiversity Credit Report (from the BBAM-C).

(ii) *Subtropical and Temperate Coastal Saltmarsh*

Additionally, the project will result in the removal of about 0.63 ha of Subtropical and Temperate Coastal Saltmarsh TEC. As such impacts have been offset utilising the BBAM-C and details of the biodiversity credit obligation is provided in Section 10 (Offset Requirements) of the BAR and Appendix C: Biodiversity Credit Report (from the BBAM-C).

Section 5 of the BAR also considered the following TECs:

(i) *Central Hunter Valley Eucalypt Forest and Woodland*

The EPBC Act listed Central Hunter Valley eucalypt forest and woodland ecological community corresponds to three New South Wales listed ecological communities: Central Hunter Grey Box-Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions EEC, Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions EEC and Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion vulnerable ecological community. In contrast to this, the community identified in the

construction footprint is the '*Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin Bioregion*' EEC, which in this instant did not meet the threshold criteria for the Central Hunter TEC.

(ii) *Lowland Rainforest of Subtropical Australia*

The Lowland Rainforest of Subtropical Australia ecological community primarily occurs from Maryborough in Queensland to the Clarence River in northern NSW. The ecological community also includes isolated areas between the Clarence River and Hunter River such as the Bellinger and Hastings Valley. None of the vegetation types confirmed in the construction footprint are consistent with the rainforest classes and formations from Keith (2006 - *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT*).

(iii) *Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion*

This ecological community is seagrass meadows dominated by *Posidonia australis* occurring in the warm temperate Manning Shelf and Hawkesbury Shelf bioregions.

The section of the Hunter River within the construction footprint is within the known distribution of this ecological community and meets to description of suitable habitat. Surveys of the Hunter River banks have been conducted for seagrass vegetation as part of this assessment, however this ecological community has not been identified.

(iv) *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria*

The EPBC Act listed River-flat eucalypt forest on coastal floodplains occurs on alluvial landforms related to coastal river floodplains and associated sites where transient water accumulates, including floodplains, riverbanks, riparian zones, lake foreshores, creek lines (including the floors of tributary gullies) floodplain pockets, depressions, alluvial flats, fans, terraces and localised colluvial fans.

A small area of PCT 1598 1649) (HU863) *Forest Red Gum grassy open forest on floodplains of the lower Hunter* was assessed as potentially this TEC however, it does not meet the description criteria. No further consideration of the condition thresholds for this community were considered.

4. Avoidance, Minimisation Mitigation & Management

Verify that the EIS/BAR demonstrates all feasible alternatives and efforts to avoid and minimise impacts on EPBC Act listed threatened species and communities (including direct, indirect and prescribed impacts) including an analysis of alternative:

- ☒ designs and engineering solutions
- ☐ modes or technologies
- ☒ routes and locations of facilities
- ☒ sites within the subject site
- ☐ verify that the EIS/BAR identifies any other site constraints in determining the location and design of the proposal (such as bushfire protection requirements, flood planning levels, servicing constraints, etc).

Verify that the EIS/BAR provides feasible measures to mitigate and/or manage impacts on EPBC Act listed threatened species and communities (including direct, indirect and prescribed impacts) including:

- ☒ techniques, timing, frequency and responsibility
- ☒ identify measures for which there is risk of failure
- ☒ evaluate the risk and consequence of any residual impacts
- ☒ any adaptive management strategy proposed to monitor and respond to impacts.

Provide advice on whether all feasible impact avoidance, minimisation, mitigation and management measures have been considered and are adequately justified:

Section 7 of BAR for details on Avoiding and Minimising impacts from the project and they are summarised here:

(i) *Avoid*:

TfNSW has carried out an extensive options development process for the project since 2004, including the consideration of alternatives to the project including the 'do nothing/do minimum option' and the development of route and alignment options. Following selection of a preferred route, the construction footprint of the project was further refined with due consideration of environmental data, including biodiversity field data gathered between 2014 and 2020. This data was also important in identifying appropriate management measures to mitigate impacts on biodiversity. The environmental focus of the route selection for the project was to align the construction footprint with existing development and infrastructure and thereby avoid biodiversity impacts where possible.

Specifically, the construction footprint aligns with existing infrastructure associated with the Hunter Water Chichester Gravity Trunk Main, the New England Highway and existing Tarro Interchange, the Pacific Highway at Tomago and the Heatherbrae light industrial land. This has resulted in a construction footprint that has minimal impact to vegetation connectivity at a landscape scale due to the fact that the route follows along the edge of existing vegetation, particularly north of Tomago Road. For this reason, in line with the NSW Koala Strategy (OEH 2018), potential impacts to large areas of koala habitat between Tomago and Raymond Terrace have been avoided and the project is not expected to impact on the movements of koalas and effectively avoids creating a potential roadkill hotspot.

Other specific impacts to biodiversity that have been avoided over the course of project development are discussed in Section 7.1 of the BAR – Avoiding impacts to biodiversity.

(ii) *Minimise*:

Section 7.2 of the BAR outlines minimising impacts to biodiversity. Following the avoidance process, where it has not been possible to avoid impacts to biodiversity by the preferred corridor location, the project has been designed to minimise impacts as far as possible. These measures are:

- Raymond Terrace – Removal of the northbound exit ramp. This design change allowed the project to minimise impacts on native vegetation in this area.
- Locating the northern abutment of Hunter River bridge across former industrial land, resulting in minimising vegetation loss.
- Inclusion and design of fauna crossing opportunities to minimise impacts to localised movements of fauna.
- Inclusion of fauna fencing along the project to deter Koalas from getting onto the new motorway, including at Black Hill, Heatherbrae and along Masonite Road, to mitigate risk of collision for transient and dispersing koalas.

(iii) *Mitigation*:

Direct impacts are summarised in Table 8-13 of the BAR (Summary of impacts on biodiversity). The summary has been tabulated to provide context to and direct the reporting of management measures required for the project to minimise impacts to biodiversity. The summary also provides context to the impacts on biodiversity values that require offsetting. Briefly the direct impacts are listed as:

- Removal of native vegetation and habitat,
- Removal of threatened fauna species habitat and habitat features,
- Removal of threatened plants,
- Removal of migratory species habitat,
- Aquatic impacts,
- Groundwater dependent ecosystems,
- Changes to hydrology,

- Fragmentation of identified biodiversity links and habitat corridors,
- Edge effects on next native vegetation and habitat,
- Injury and mortality of fauna,
- Invasion and spread of weeds,
- Invasion and spread of pests,
- Invasion and spread of pathogens and disease,
- Noise, dust, light and contaminants, and
- Cumulative impacts.

Section 9 of the BAR details the Mitigation Strategy to address the identified direct, indirect and prescribed impacts, as detailed in Section 8 of the BAR. Table 8-1 provides a summary of the proposed clearing of native vegetation, detailing PCTs to be cleared and their corresponding area, and whether they represent State or Commonwealth listed TECs; whilst Table 8-13 details the impacts.

Section 9 of the BAR provides details on the mitigation measures to be imposed under a Biodiversity Management plan. Theis sections provides detailed discussions on connectivity and koalas, and then a summary of additional mitigation measures in Table 9-2 (Biodiversity Management Measures).

BCD provides in general support to the avoid, minimise and mitigate measures and acknowledges they have been provided in accordance with the FBA guidelines.

CONNECTIVITY:

The project has been assessed under FBA as having minimal impact on habitat connectivity at a landscape scale, however small-scale and isolated fragmentation impacts have been noted and are addressed by habitat connectivity measures proven to be effective. The location of connectivity measures is therefore targeted at fragmented vegetation that is likely to be retained in the medium to long-term. The goals of the habitat connectivity measures are to:

- Reduce and minimise roadkill to maintain viable fauna populations.
- Promote gene flow and provide functional crossing opportunities in a fragmented landscape.
- Maintain home range movements for individuals and maintenance of landscape connectivity for existing populations for dispersal and breeding.

The specifications of connectivity structures discussed in Section 9 are presented in detail in the Draft Wildlife Connectivity Guidelines (Roads and Maritime, 2011). The structure types picked for this projected were identified based on their known effectiveness for the target species reported on other TfNSW highway upgrades and include:

- Canopy bridges,
- Glider poles,
- Under bridge crossings, and
- Fencing.

Table 9-1 of the BAR provides a summary of proposed fauna connectivity measures and their proposed location along the development footprint. BCD concurs these represent a range of suitable measures to maintain or improve connectivity.

KOALAS:

Section 9 of the BAR notes that fauna fencing has been provided as the main mitigation measure in targeted areas along the project to deter Koalas from getting onto the new motorway, including at Black Hill, Heatherbrae and along Masonite Road, to mitigate risk of collision for transient and dispersing Koalas.

Consideration was given to the need for additional underpasses to connect Koala habitat, but these were not deemed to be required as the project has been identified as having minimal impact on landscape connectivity for ground-dwelling fauna, including Koala.

BCD supports the additional construction of an underpass near Windeyers Creek lined with furniture to facilitate future connectivity, particularly for Koalas.

ADDITIONAL MEASURES:

The potential residual impacts to biodiversity from the project that form the basis of the mitigation strategy can be summarised as:

- Potential inadvertent impacts to retained areas of vegetation adjacent to the project, including native vegetation, TECs, and habitat for flora and fauna
- Fauna injury and mortality during clearing of vegetation for construction and vehicle strike during operation
- Edge effects, and the potential introduction of weeds and disease pathogens into adjoining vegetation and habitat.
- Habitat fragmentation, barrier effects and fauna mortality during operation
- Construction and operational impacts on aquatic habitats.

Table 9-2 of the BAR provides a detailed summary of mitigation measures to be employed by the project, where biodiversity management measure 'B01' indicates the Flora and Fauna Management Plan will include an adaptive management strategy proposed to monitor and respond to impacts. Table 9-2 also identifies timing/frequency, responsibility and effectiveness (risk of failure) of proposed mitigation measures.

5. Impact Assessment

Verify that the EIS/BAR:

☒ identifies the residual adverse impacts likely to occur to each EPBC Act listed threatened species and/or community after the proposed avoidance and mitigation measures are taken into account

☒ provides adequate justification and evidence for the predicted level of impact, with reference to the:

- Commonwealth's Significant Impact Guideline*:* *https://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf*
- DPIE Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact (SAII): (*https://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf)*

Complete the following information for each EPBC Act listed threatened species and/or community (add/remove rows as necessary):

- EPBC Act listed threatened species and/or community
- nature and consequences of impacts (i.e., direct and indirect)
- duration of impact (e.g., construction, operation, life of project)
- quantum of impact
- consequences of impacts on the species, the population and / or extent of the community at local, state and national scales

Confirm the level of predicted impact (cross appropriate):

☒ high risk of impact (requiring offsets)[#] or SAII (*not considered under FBA) ☐ Low risk of impact (not requiring offsets)

[#] For purposes of EPBC approval, as a minimum, significant adverse residual impacts **must** be offset (significant impact can be evaluated with reference to the significance impact guidelines

Summary of impact assessment identifying MNES species and communities are provided in Table 1 below.

Table 1- Summary of Impact Assessment

EPBC Act entity	Nature & consequence of impact (direct & indirect)	Duration of impact (e.g., construction, operation, life of project)	Quantum of impact	Consequence of impact at local, state and national scale	Level of impact (is an offset required?)
Koala (endangered[6] EPBC Act)	89.1 ha (determined by species polygon) – Direct loss of potential, such as foraging habitat and indirect impacts on adjoining habitats. Koala movements not impacted	Long-term, permanent habitat loss and increased fragmentation	89.1 ha (determined by species polygon associated with PCT ID: 1588, 1590, 1593,1598 1646, 1717, and 1724)	Long-term permanent habitat loss and increased fragmentation	Significant impact which requires species credits to be generated and offset accordingly under the FBA.
Regent Honeyeater (critically endangered EPBC Act)	Direct loss of potential foraging habitat	Long-term permanent habitat loss	82.1 ha (based on PCT ecosystem credits as surrogates for habitat)	Long-term permanent habitat loss	The proposed action is considered unlikely to lead to a long-term decrease in the size of the Regent Honeyeater population as the proposed action will not impact on the critical remaining strongholds of the species or an area of known important habitat for breeding or foraging. However, impacts to the potential habitat of this species were quantified in the BAR and the PCTs associated with this habitat would be offset in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the FBA.
Swift Parrot (critically endangered EPBC Act)	Direct loss of potential foraging habitat	Long-term permanent habitat loss	81 ha (based on PCT ecosystem credits as surrogates for habitat)	Long-term permanent habitat loss	Not a significant impact. However, impacts to the potential habitat of this species were quantified in the BAR and the PCTs associated with this habitat would be offset in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the FBA.
Grey-headed Flying-fox (vulnerable EPBC Act)	Direct loss of potential foraging habitat	Long-term permanent habitat loss	85 ha (based on PCT ecosystem credits as surrogates for habitat)	Long-term permanent habitat loss	Not a significant impact. However, impacts to the potential habitat of this species were quantified in the BAR and the PCTs associated with this habitat would be offset in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the FBA.

[6] At the time of controlled action decision, 14 January 2019, the Koala was listed as vulnerable under the EPBC Act.

EPBC Act entity	Nature & consequence of impact (direct & indirect)	Duration of impact (e.g., construction, operation, life of project)	Quantum of impact	Consequence of impact at local, state and national scale	Level of impact (is an offset required?)
Australasian Bittern (endangered EPBC Act)	43 ha of potential habitat (based on species polygon)	Long-term, permanent habitat loss and increased fragmentation	43.7 ha	Long-term permanent habitat loss	Significant impact, which requires species credits to be generated and offset accordingly under the FBA.
Eucalyptus parramattensis subsp. decadens (vulnerable EPBC Act)	34 plants	Long-term (construction and operation)	34 plants	Long-term permanent loss, very small percentage of subspecies known distribution	Not a significant impact, but under the FBA species removal generates species credits which will need to be retired.
Persicaria elatior (vulnerable EPBC Act)	3 plants	Long-term (construction and operation)	3 plants	Long-term permanent loss, very small percentage of subspecies known distribution	not a significant impact, but under the FBA species removal generates species credits which will need to be retired.
Uperoleia mahonyi Mahony's Toadlet[7] (Endangered under the EPBC Act)	Potential foraging / breeding of 3.1 ha	Medium to long-term (construction and operation)	3.1 ha	Long-term permanent habitat loss	Potential significant impact, which requires species credits to be generated and offset accordingly under the FBA.
Removal of habitat for wetland and terrestrial migratory species listed under the EPBC Act[8]	Removal of habitat for wetland and terrestrial species listed under the EPBC Act including Latham's Snipe, Rufus Fantail and Satin Flycatcher.	Medium to long-term (construction and operation)	69 ha floodplain wetland (grazed) habitats and 70.5 ha terrestrial forest habitat	Local removal of potential habitat	Not a significant impact. However, impacts to the potential habitat of this species were quantified in the BAR and the PCTs associated with this habitat would be offset by like-for-like PCTs in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the FBA.
Removal of Subtropical and Temperate Coastal Saltmarsh TEC	0.63 ha	Long-term (construction and operation)	0.63 ha	Long-term permanent loss, very small percentage of subspecies known distribution	No offset required under FBA as it is a saline PCT (as per Section 5.1.1.12 of the FBA).

[7] Mahony's Toadlet was listed under the EPBC Act in March 2021. In accordance with section 158A of the EPBC Act, listings and uplistings after the controlled action decision (for M1 that was 14 Jan 2019). Therefore impacts to Mahony's Toadlet cannot be considered as part of the EPBC Act approval decision for the proposed action.

[8] Note Migratory species have not been triggered for this project.

Impacts for the Koala, Regent Honeyeater, Swift Parrot and Grey-headed Flying-fox Impact have been calculated by the area of associated PCTs within the construction footprint, that contain suitable foraging, breeding or other habitats associated habitat (As per the BBAM-C – Appendix C of the BAR - Biodiversity credit report). For example, Koala is based on primary, secondary and supplementary feed tree species.

BCD has identified a discrepancy between Table 1-3 (Summary of ecosystem credits required) in the Biodiversity Offset Strategy (Appendix K of the BAR) and the Biodiversity Credit Report (Appendix C of the BAR) with respect to credit obligations for a PCT. For PCT 1588: *Grey Ironbark - Broad-leaved Mahogany - Forest Red Gum shrubby open forest on Coastal Lowlands of the Central Coast* Table 1-3 states there is 7.74 ha within the development (construction) footprint, whilst Appendix C 7.60 ha is listed.

Initial Review noted:
RECOMMENDATION: The accredited assessor indicate which hectare figure is correct for PCT 1588, and then update BAR and BBAM-C or provide justification why the numbers are different.

RESPONSE: TfNSW have corrected the figure for PCT 1588 which is 7.74 and updated the BAR (including Appendix C – Credit Profile Report (based on Revised BAR, received on 4 July 2022).

The data in the above Table comes from Table 4.10 (Threatened species survey results) , Table 8-13 (Summary of impacts on biodiversity) and the Assessment of Significance in Appendix D of the BAR. The discussion and summary on impacts to biodiversity is from Section 8 of the BAR, which has been previously detailed and discussed above. Further quantification of impacts is provided through Section 8 and offsets required, including species and ecosystem credits obligations is provided in Section 10 of the BAR and the Biodiversity Offset Strategy (Appendix K of the BAR). Table 8-13 identifies the residual impacts on MNEs after mitigation is applied, and includes the nature of impact, extent and duration.

Provide advice on whether adequate justification and evidence is provided for species and communities that have been identified as being at low risk of impact.

BCD is of the opinion that various sections of the BAR, notably the Assessment of Significance (Appendix D of the BAR) and matters for further consideration (Appendix E of the BAR) provides adequate justification and reasoning that MNES matters are at low risk of significant impact.

6. Offsets

Verify that the EIS/BAR:

- ☐ identifies any MNES that haven't been offset using the BBAM
- ☒ identifies how impacts requiring offsets correlate to MNES impacts
- ☒ identifies the plant community types (PCTs) requiring offset and the number and type of ecosystem credits required for impacts to MNES
- ☒ identifies threatened species requiring offset and the number of species credits required for impacts to MNES
- ☒ correctly uses the BBAM (and BBAM calculator) to identify the number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity
- ☒ identifies if ecological rehabilitation and/or biodiversity conservation actions are proposed for offsetting
- ☐ if known, identifies any other offsetting approach proposed, such as land-based offsets, retiring credits by payment into the Biodiversity Conservation Fund and/or through supplementary measures[#]

In accordance the FBA there is no longer a requirement to define the offsetting approach at EIS stage, apart from providing a Biodiversity Offset Strategy BOS) that provides a summary of how the offsets will be met. The Biodiversity Conservation Trust (BCT) will manage the BOS. BCD confirms that a BOS has been completed in accordance with the FBA and is appended to the BAR as Appendix K. This BOS outlines TfNSW approach with respect to offset requirements, as summarised below. All MNES matters for the project have been offset utilising the BBAM and detailed in the following Table 2.

Overview of biodiversity offsets:

In accordance with the *NSW Biodiversity Offsets Policy for Major Projects* (OEH 2014b), biodiversity impacts have been avoided and minimised where possible by locating the project within or next to existing road infrastructure and in cleared rural areas. Residual impacts on biodiversity would be offset in accordance with the FBA and the *NSW Biodiversity Offsets Policy for Major Projects*.

The credits required to offset the residual impacts of the project were calculated using the BioBanking Assessment Methodology (BBAM) and include 8,133.3 ecosystem credits and 22,242 species credits.

Offset Strategy:

The offset strategy proposed for this project will prioritise like for like credits however may subsequently consist of any combination or sequence of the actions provided below:

- Confirm credit requirements at finalisation of clearances,
- Purchase of available credits,
- Apply for an assessment of reasonable equivalency,
- Establish Biodiversity Stewardship Agreements on candidate properties,
- Payment to the Biodiversity Conservation Fund,
- Use of the variation criteria or use of supplementary measures if suitable credits cannot be identified,
- Identify and secure appropriate offsets for saline vegetation formations in consultation with NSW DPI Fisheries, and
- Offsets for Matters of National Environmental Significance.

In terms of offset availability, a review of available credits on the DPIE public credit register indicates that the current credit market cannot provide all the credits required. TfNSW has not purchased any credits for this project to date.

Pending project approval, TfNSW would commence any combination of the above listed actions with a priority of like-for-like credits to satisfy the biodiversity offset requirements. Where credits cannot be purchased or generated, TfNSW may choose to pay into the Biodiversity Conservation Fund to satisfy the biodiversity offset requirements.

Table 2 - MNES Impact and Offset Summary

Threatened Species / Community listed under EPBC Act	PCTs associated with the ecosystem credit species / ecological community (if applicable)	Area of Impact (ha)	Credits Required	Offsetting Approach	Reference (EIS, revised BAR)
No TECs present; except for a small area of Subtropical and Temperate Coastal Saltmarsh TEC	N/A.	0.63ha	No offset required under FBA as it is a saline PCT	N/A	As per Section 5.1.1.12 of the FBA)
Koala	1646, 1717, 1724, 1588, 1598, 1590 and 1593	89.1 ha	2,317	Source and retire credits	Section 10 and BOS (App K)
Australasian Bittern	1742, 1746, 1727, 1071, 1736	43.7 ha	567	Source and retire credits or pay onto BCF	Section 10 and BOS (App K)
Regent Honeyeater	1590, 1646, 1649, 1717 and 1724	82.1 ha	Part of ecosystem credits	Ecosystem credits	Section 10, Appendix D and BOS (App K)

Threatened Species / Community listed under EPBC Act	PCTs associated with the ecosystem credit species / ecological community (if applicable)	Area of Impact (ha)	Credits Required	Offsetting Approach	Reference (EIS, revised BAR)
Swift Parrot	1590, 1646, 1716 and 1717	81.1 ha	Part of ecosystem credits	Ecosystem credits	Section 10, Appendix D and BOS (App K)
Grey-headed Flying-fox	1747(*does not contribute to credits as it is a saline PCT – as per Section 5.1.1.12 of the FBA), 1716, 1590, 1646 and 1717	83.4 ha	Part of ecosystem credits	Ecosystem credits	Section 10, Appendix D and BOS (App K)
Eucalyptus parramattensis subsp. *decadens*	N/A – impact is 34 plants		476	Source and retire credits of pay into BCF	Section 10 and BOS (App K)
Persicaria elatior	N/A – impact is 3 plants		39	Source and retire credits, or pay into BCF	Section 10 and BOS (App K)
Uperoleia mahonyi — Mahony's Toadlet[9]	PCT 1646, 1718, 1071	3.1	40	Species Credit	Section 10 (App K)

A list of MNES likely to be impacted by the project have been assessed by the BBAM.

The project was determined to be a controlled action based on its potential to impact on the following MNES, and these species have been listed and mentioned numerous times throughout the EIS, BAR and BOS. All entities have been assessed in accordance with the BBAM:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland- threatened ecological community (TEC) – endangered under the EPBC Act. Although ultimately this TEC was not detected in the development footprint.
- Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) – endangered[10] under the EPBC Act
- Swift Parrot (*Lathamus discolor*) – critically endangered under the EPBC Act
- Regent Honeyeater (*Anthochaera phrygia*) – critically endangered under the EPBC Act
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable under the EPBC Act.

The referral to DCCEEW, determined that significant impacts would be unlikely for Earp's Gum (*Eucalyptus parramattensis* subsp. *decadens*), Small-flowered Grevillea (*Grevillea parviflora* subsp. *parviflora*), Tall Knotweed (*Persicaria elatior*), Australasian Bittern (*Botaurus poiciloptilus*), Australian Painted Snipe (*Rostratula australis*), Spotted-tailed Quoll (*Dasyurus maculatus*), New Holland Mouse (*Psuedomys novaehollandiae*) and Green and Golden Bell Frog (*Litoria aurea*). These species were also located in or within close proximity of the development (construction) footprint.

The project will also result in the removal of about 0.63 ha of Subtropical and Temperate Coastal Saltmarsh TEC.

Provide advice on the adequacy of the proposed offsets in meeting the requirements of the BBAM:

BCD advises that the BAR has provided an assessment of ecosystem values (vegetation integrity), targeted species credit surveys and applied species polygon in accordance with the FBA and the BBAM for 'species credit' MNES species; and MNES species for which PCTs are used as surrogates for habitat have also been assessed in

[9] Mahony's Toadlet was listed under the EPBC Act in March 2021. In accordance with section 158A of the EPBC Act, listings and uplistings after the controlled action decision (for M1 that was 14 Jan 2019). Therefore impacts to Mahony's Toadlet cannot be considered as part of the EPBC Act approval decision for the proposed action.

[10] At the time of controlled action decision, 14 January 2019, the Koala was listed as vulnerable under the EPBC Act.

accordance with the appropriate methodology. This includes the correct application of the BBAM-C (credit calculator) to determine the appropriate credit obligation (both species and ecosystem) for impacts to MNES matters; and that offsetting meets the requirements of a BOS under the FBA (refer to Section 10 of the BAR and Appendix K).

Offsets are identified in Section 10 of the BAR and Appendix K (BOS), this includes offsets calculated for PCTs (ecosystem credits) and species credits. The BOS has been undertaken in accordance with the FBA requirements. The offset strategy proposed for this project provides a commitment that the proponent will prioritise like for like credits (as per the EPBC Act) however in instances where these are not available any combination or sequence of the provided actions under the FBA (as detailed above) will be used.

Table 10-1 (Ecosystem credits summary) in Section 10 of the BAR provides a summary of the ecosystem credit obligation for the Project under the FBA and indicates the credit requirements MNES species where the PCT is used as the surrogate for habitat as per Table 2 above (e.g., Regent Honeyeater, Swift Parrot and Grey-headed Flying-fox).

MNES 'species credit' species are detailed in Table 10-2 of the BAR, notably Koala (based on species polygon for core foraging habitat), Australasian Bittern (based on species polygon of suitable wetland PCTs), Eucalyptus parramattensis subsp. parramattensis and Persicaria elatior.

7. Other considerations

Verify if any relevant Commonwealth guidelines and policy statements are applicable to the action and listed threatened species and/or community, including but not limited to:

☒ International environmental obligations

☒ Recovery Plans

☒ Approved Conservation Advice

☒ Threat Abatement Plans

The relevant Commonwealth guidelines and policy statements for each species and community are available at: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

For each EPBC Act listed threatened species and/or community, provide advice on whether the assessment has been adequately informed by applicable Commonwealth guidelines and/or policy statements. For example, the interaction between the proposed action and important populations or critical habitat identified in policy documents and/or the interaction between the proposed action and threatening processes or recommended conservation actions outlined in Commonwealth policies and plans.

International Environmental Obligations

Statements in the BAR or EIS about International Agreements are located in:

- Section 5.3 (Wetlands of international importance – Ramsar wetlands) and Appendix G (Aquatic Habitat Assessment): - as described in Section 2.2.4, the Hunter Estuary Wetlands Ramsar site is located within 10 km of the project (refer to Figure 1-1 and Figure 2-1). It is made up of two components, the Hunter Wetlands National Park on Kooragang Island (Kooragang Nature Reserve) and the Hunter Wetlands Centre Australia in Shortland. Geographically, the Kooragang Nature Reserve is located about 1.9 km to the south east of the construction footprint, however, is about 5.1 km downstream from the project at the proposed Hunter River crossing.

  The potential impact of construction of the project on the Hunter River is addressed in Section 8.4, however no indirect water quality impacts to Kooragang Nature Reserve are anticipated because the Hunter River is expected to provide sufficient dilution to basin discharges entering the waterway prior to reaching the site. Dilution modelling is provided in the Surface Water and Groundwater Quality Working Paper (Appendix K of the EIS) and the Surface Water and Groundwater Quality Supplementary Report (Transport for NSW, 2022b). Section 8.4.2 of the BAR also discusses and assesses impacts to the Ramsar wetland.

- Section 5.7 of the BAR discusses impacts to migratory species to which Australia is party to international agreements (under the EPBC Act), such as: Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA) and Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA). These agreements provide an important mechanism for pursuing conservation outcomes for migratory birds, including potential migratory waterbirds and forest birds for the Project, which are listed in Table 5-3. The following migratory species were recorded within the development footprint and assessed as (Section 8.3):
    - Latham's Snipe, a wetland migratory bird species, was observed in an open grassy floodplain ephemeral wetland next to wetlands mapped under State Environmental Planning Policy (Resilience and Hazards) 2021 at the western end of the construction footprint. 69.05 ha of suitable freshwater wetlands habitat will be impacted by the development; this will be offset via the offsetting of similar PCTs ecosystem credits. This is one the most common wetland birds in the Hunter Estuary and there is extensive suitable habitat not being impacted by the proposal.
    - The Rufous Fantail and Satin Flycatcher (both terrestrial migratory bird species) were recorded at Black Hill near the proposed interchange with the M1 Pacific Motorway within Spotted-Gum – Ironbark Forest with a paperbark understorey. Fantail was also recorded in the sandy Blackbutt dominated forest at the northern end of the project. Suitable habitat for these species is widespread across the construction footprint and wider area, and as such impact to these species would be minimal and only affect non-breeding habitat. 68.76 ha of associated habitat ((PCT 1590 and PCT 1646) will be impacted by the development; this will be offset via the offsetting of similar PCTs ecosystem credits.
    - The White-bellied Sea-Eagle, a marine migratory bird species, was seen soaring high over the construction footprint in two locations around Tomago and Heatherbrae. This species is expected to have been passing through the construction footprint, where it may forage. No large stick nests were identified during surveys, so it appears breeding habitat will not be impacted on. Extensive foraging habitat exists around the development (in excess 1000ha), despite the proposal affecting 173.81 ha of potential foraging habitat; this will be offset via the offsetting of similar PCTs ecosystem credits.

In general, for MNES entities, such as Approved Conservation Advice is addressed under see Section 5.4 of the BAR; Listing advice under Sections 5.4.1, 5.4.2 and 5.4.3; Recovery Plans under Appendix D, Threat Abatement Plans under Appendix D. More specific details are provided below:

1. *Regent Honeyeater*:

APPROVED CONSERVATION ADVICE

Primary Conservation Objectives:

- Reverse the long-term population trend of decline and increase the numbers of regent honeyeaters to a level where there is a viable, wild breeding population, even in poor breeding years
- Maintain key regent honeyeater habitat in a condition that maximises survival and reproductive success and provides refugia during periods of extreme environmental fluctuation.

The proposed action would result in a small reduction in the extent of potential non-breeding foraging habitat for this species. However, impacts are predicted to be minimal as this species is unlikely to use the construction footprint consistently. The proposed action is unlikely to reduce the population size of the Regent Honeyeater or decrease the reproductive success of this species. The proposed action would not interfere with and key breeding sites or foraging areas and will not interfere with the recovery of the Regent Honeyeater.

LISTING ADVICE

Nil.

RECOVERY PLANS

The Regent Honeyeater Recovery Plan 1999-2003 (Department of Natural Resources and Environment, 1999) outlines recovery actions for the species. These include:

- Project management: Continue to manage the Recovery Team and full-time Coordinator; increase the contribution of the NSW Government to program management; encourage greater input from the Queensland and ACT wildlife agencies; encourage and direct the contributions of Operations Groups

centred on regions containing key habitat; increase the effectiveness of collaboration with the Swift Parrot Recovery Team.

- Habitat management: Rehabilitation and revegetation are best achieved by facilitating community ownership and participation in these activities. Expand the composition, influence and resources of Operations Groups in the four key regions so that they are able to implement regional works plans. Prepare regional guidelines for management of Regent Honeyeater habitat, ensure that regional ecosystem management plans take account of the guidelines and promote them to landholders and agency staff. Obtain agreements to undertake cooperative work with landholders to alleviate threats. Prepare bids for funding from Bushcare to allow operations groups to shoulder their increased responsibilities. Where shown to be necessary, active management of populations of predators and competitors should be carried out.
- Population monitoring: Initiate a population monitoring program at the three main breeding areas; take full advantage of the existing sightings database and the Birds Australia Bird Atlas Project to elucidate distribution patterns and the magnitude of the range reduction over recent decades.
- Ecological research: Initiate innovative research into movement patterns, particularly post breeding, and the degree of isolation between breeding populations; investigate the impact of Noisy Miners on population stability and undertake a comparison of resource utilisation between northern NSW and Victoria.
- Community education and participation: Conduct a public education program about the species and its requirements, aimed particularly at developing habitat management partnerships with landowners within the range of the species; establish an educational Regent Honeyeater exhibit at Taronga Zoo. Produce a semi-annual newsletter.
- Captive management: Maintain a viable captive population, spread across at least three ARAZPA institutions, to act as insurance against the demise of the wild population; conduct trials of hard-release techniques; complete the captive husbandry manual and a guide to aging and sexing Regent Honeyeaters.

The recovery actions listed above to help recover the Regent Honeyeater are largely not applicable to the proposed action. The proposed action will not interfere with the recovery plan for the Regent Honeyeater.

THREAT ABATEMENT PLANS
Nil – but the '*Threat abatement plan for competition and land degradation by rabbits*' is listed on the species EPBC website, the species is not listed specifically in the threat abatement plan, so it may just apply broadly to the damage of habitat, particularly recruitment of feed trees through browsing of seedlings. The project will not impact this.

2. *Swift Parrot*:

APPROVED CONSERVATION ADVICE
Ongoing habitat loss, particularly within the primary breeding areas in Tasmania, represents the single biggest threat to the survival of the swift parrot in the wild, particularly as it now appears to enhance nest predation by introduced sugar gliders. The primary conservation action for swift parrots is, therefore, to prevent further habitat destruction from land clearance, grazing and forestry activities in high quality swift parrot summer nesting and breeding habitat. The proposal does not impact on this as it is located outside of Tasmania.

LISTING ADVICE
Nil.

RECOVERY PLANS
The National Recovery Plan for the Swift Parrot (Saunders and Tzaros, 2011) identifies the following actions for recovery of this species:

- Identify the extent and quality of habitat
- Manage and protect Swift Parrot habitat at the landscape scale
- Monitor and manage the impact of collisions, competition and disease
- Monitor population and habitat.

The recovery actions listed above to help recover the Swift Parrot are largely not applicable to the proposed action. The proposed action will not interfere with the recovery of the Swift Parrot (*Lathamus discolor*).

THREAT ABATEMENT PLANS

The 'Threat abatement plan for predation by feral cats' applies to this species, as it adversely affects it survival. It is unlikely that the project will contribute an increase in feral cats, given the site adjoins areas of urban and peri-urban, where cats likely already reside.

Grey-headed Flying-fox:

APPROVED CONSEVATION ADVICE

There is no approved Conservation Advice for this species

LISTING ADVICE

Nil.

RECOVERY PLANS

The Draft National Recovery Plan for the Grey-headed Flying-fox (*Pteropus poliocephalus*) outlines the following actions:

- Identify and protect foraging habitat critical to the survival of Grey-headed Flying-foxes across their range.
- Enhance winter and spring foraging habitat for Grey-headed Flying-foxes.
- Identify, protect and enhance roosting habitat critical to the survival of Grey-headed Flying-foxes.
- Significantly reduce levels of deliberate Grey-headed Flying-fox destruction associated with commercial Horticulture.
- Provide information and advice to managers, community groups and members of the public that are
- involved with controversial flying-fox camps.
- Produce and circulate educational resources to improve public attitudes toward Grey-headed Flying-foxes,
- promote the recovery program to the wider community and encourage participation in recovery actions.
- Monitor population trends for the Grey-headed Flying-fox
- Assess the impacts on Grey-headed Flying-foxes of electrocution on powerlines and entanglement in netting and barbed wire and implement strategies to reduce these impacts.
- Oversee a program of research to improve knowledge of the demographics and population structure of the Grey-headed Flying-fox.
- Maintain a National Recovery Team to oversee the implementation of the Grey-headed Flying-fox National Recovery Plan.

The recovery actions listed above are largely not applicable to the proposed action and accordingly the proposed action is not expected to interfere substantially with the recovery of the species.

THREAT ABATEMENT PLANS

No Threat Abatement Plan has been identified as being relevant for this species.

Koala:

APPROVED CONSERVATION ADVICE

The conservation advice lists 6 strategies: - Four supporting strategies and two on-ground (direct) strategies are included.

Supporting strategies:

- Strategy 1: Build and share knowledge.
- Strategy 2: Strong community engagement and partnerships.
- Strategy 3: Increase habitat protection.
- Strategy 4: Koala conservation is integrated into policy, and statutory and land-use plans.

On-ground strategies:

- Strategy 5: Strategic habitat restoration.
- Strategy 6: Active metapopulation management.

LISTING ADVICE

Nil.

RECOVERY PLANS

The National Recovery Plan for the Koala (April 2022, available at: https://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/koala-2022) identifies the following objectives for recovery of this species:

- To conserve Koalas in their existing habitat.
- To rehabilitate and restore Koala habitat and populations.
- To develop a better understanding of the conservation biology of Koalas.
- To ensure that the community has access to factual information about the distribution, conservation and management of Koalas at a national, state and local scale
- To manage captive, sick or injured Koalas and orphaned wild Koalas to ensure consistent and high standards of care.
- To manage over browsing to prevent both Koala starvation and ecosystem damage in discrete patches of habitat.
- To coordinate, promote the implementation and monitoring the effectiveness of the NSW Koala Recovery Plan across NSW.

The proposed action will not interfere with any of the objectives identified in the National Recovery Plan.

THREAT ABATEMENT PLANS

No Threat Abatement Plan has been identified as being relevant for this species.

8. Recommendations

Provide advice on any recommended conditions and reasons for imposing the conditions:

Recommended conditions have been provided at the end of the document, but the proponent need to address the outstanding issues below first.

Outstanding Issues:

BCD has reviewed the document with respect to the bilateral requirements and recommends that the following issues be addressed before any approval by DCCEEW and that an updated BAR and BBAM-C (if required) be provided:

- There is an inconsistency for the area to be cleared between the BAR, which states the area to be cleared is 173.81 ha) compared to the Credit Profile Reports (Summary of ecosystem credits required) from the BBAM-C in Appendix C, which states the area to be cleared is 174.25 ha. The assessor needs to advise of the correct value, provide justification and amend the BAR and BBAM-C as required.

  DPE provided an email update (dated 22 June 2022) on the 'area to be cleared' discrepancy. They indicate the BBAM calculator issue has been corrected, noting:

  > '*TfNSW have advised the BBAM calculator issue has been corrected. See below summary from our biodiversity assessor Chris Thompson. He has re-run the calculation however the BBAM-C printout is still not showing the new numbers, even though they have been updated and the credits calculated are correct. As such, there may still appear to be a discrepancy with Appendix C of the BAR however this is not the case. Chris advised that he will follow up with Steve Lewer and Phil Wood to ensure they are aware and attempt to fix the printout report but it might not be possible*'. BCD has been advised there is a system glitch with the BBAM-C that is preventing the correct value being shown, this is likely due to the old calculator (BBAM) no longer being updated / maintained by BCD.
  >
  > TfNSW provide the following justification for the discrepancy:
  >
  > "*The main difference was Coastal Saltmarsh which the BAR identifies correctly as 1.33 ha while the BAM calc still had 1.88 ha from a previous calculation prior to the 80% design… this has been changed to 1.33 ha in the calculator… changes were also made to the Swamp Oak – Sea Rush / Baumea community from 8.85 to 8.84 ha. Both numbers were correct in the BBAM-C and the total matched the 173.82 ha in the BAR*".

RESPONSE: TfNSW updated the and BAM-C (Credit Profile Report) with correct figure – 173.81 ha; justification provided in Section 8 BAR (Recommendations) of this Bilateral Report (based on Revised BAR (received 4 July 2022).

- The output from the Protected Matters Search Tool should be provided as an Appendix of the BAR (as per DCCEEW's MNES requirements).

  RESPONSE: TfNSW provided the Protected Matters Search Tool output as Appendix L of the BAR (based on Revised BAR, received on 4 July 2022).

- The BAR be revised to include a copy of the EPBC Referral Decision Brief for the project (EPBC Ref: 2018/8288; dated 14 January 2019) (as per DCCEEW's MNES requirements).

  RESPONSE: TfNSW provided the EPBC Referral Decision Brief for the project (EPBC Ref: 2018/8288; dated 14 January 2019) as Appendix M of the BAR (based on Revised BAR, received on 4 July 2022).

- The discrepancy between the BAR (Table 4-10) and Appendix D of the BAR be updated with the correct area of potential habitat for the Regent Honeyeater, which appears to be 82.1 ha given the areas of the associated PCTs in Table 6-1 of the BAR.

  RESPONSE: TfNSW has updated Appendix D with the correct area of 82.1 ha which corresponds with Table 4-10 of the BAR (based on Revised BAR, received on 4 July 2022).

- The discrepancy between the BAR (Table 4-10) and Appendix D of the BAR be updated with the correct area of potential habitat for the Grey-headed Flying-fox, which appears to be 83.4 ha given the areas of the associated PCTs in Table 6-1 of the BAR.

  RESPONSE: TfNSW has updated Appendix D with the correct area of 83.4 ha which corresponds with Table 4-10 of the BAR (based on Revised BAR, received on 4 July 2022).

- The accredited assessor should indicate which hectare figure is correct for PCT 1588, and then update the BAR and BBAM-C or provide justification why the numbers are different. Given that BCD has identified a discrepancy between Table 1-3 (Summary of ecosystem credits required) in the Biodiversity Offset Strategy (Appendix K of the BAR) and the Biodiversity Credit Report (Appendix C of the BAR) with respect to credit obligations for a PCT. For PCT 1588: *Grey Ironbark - Broad-leaved Mahogany - Forest Red Gum shrubby open forest on Coastal Lowlands of the Central Coast* Table 1-3 states there is 7.74 ha within the development (construction) footprint, whilst Appendix C 7.60 ha is listed.

  RESPONSE: TfNSW have corrected the figure for PCT 1588 which is 7.74 and updated the BAR (including Appendix C – Credit Profile Report (based on Revised BAR, received on 4 July 2022).

BCD confirms all matters from our email to Planning and Assessment (dated 1 July 2022 and provided to TfNSW on the same day) have been adequately addressed.

Recommended Conditions:

1. The project through its minimise and mitigation strategies (as per Section 7 of the BAR) should be consistent with the Commonwealth Recovery Plan and Listing Advice for all MNES affected threatened species.
2. Specifically, the project through its minimise and mitigation strategies (as per Section 7 of the BAR) should be consistent with the Commonwealth Recovery Plan and Listing Advice for Koala (available at https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=85104), namely the six strategies:

   Supporting strategies:
   - Strategy 1: Build and share knowledge.

- Strategy 2: Strong community engagement and partnerships.
- Strategy 3: Increase habitat protection.
- Strategy 4: Koala conservation is integrated into policy, and statutory and land-use plans.

On-ground strategies:
- Strategy 5: Strategic habitat restoration.
- Strategy 6: Active metapopulation management.

9. Reviewer Details

Provide details of reviewers:

Primary Reviewer:	Steve Lewer (Senior Regional Biodiversity Conservation Officer, Newcastle, DPE)
Phone:	0459 082 162
Email:	steve.lewer@environment.nsw.gov.au
Date Review Finalised:	30 June 2022

Recommendation

It is recommended that the delegated officer:
- Considers the matters set out in this report; and
- Decides to: (i) Determine the Bilateral meets all MNES matters or (ii) It does not address all MNES matters.

KAREN THUMM
A/Senior Team Leader Planning,
Hunter Central Coast Branch
Biodiversity and Conservation Division

Date 7 October 2022

Approved by

SARAH BALMANNO
A/Director, Hunter Central Coast Branch
Biodiversity and Conservation Division

Date 7 October 2022

Appendix G – Assessment of Matters of National Environmental Significance

In accordance with the Bilateral Agreement between the Commonwealth and NSW Governments, the Department provides the following additional information required by the Commonwealth Minister for the Environment and Water (the Minister), in deciding whether or not to approve a controlled activity under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Department considers that all threatened species and ecological communities protected under Part 3 of the EPBC Act have been adequately assessed and documented in the *M1 Pacific Motorway Extension to Raymond Terrace Environmental Impact Statement* (EIS) (July 2021) and *M1 Pacific Motorway Extension to Raymond Terrace Submissions Report* (RtS) (June 2022).

This assessment has been prepared based on the information contained in the following sections of the EIS which address matters of national environmental significance (MNES):

- Chapter 4 – Proposal development and alternatives
- Chapter 6 – Consultation
- Chapter 9 – Biodiversity
- Chapter 23 – Cumulative impacts
- Chapter 24 – Environmental management measures
- Chapter 26 – Proposal justification and conclusion
- Appendix C – Schedule 4 of the Environment Protection and Biodiversity Conservation Regulations 2000 (Commonwealth) checklist, and
- Appendix I – Biodiversity assessment report.

The relevant section of the RtS that addresses MNES is Appendix E - Revised biodiversity assessment report. In addition, advice has been provided by Biodiversity and Conservation Division of the Environment and Heritage Group of the Department of Planning and Environment on MNES (refer **Appendix F**).

This Appendix is supplementary to and should be read in conjunction with the assessment included in **Section 6.3** of the assessment report which includes the Department's consideration of impacts to listed threatened species and communities, mitigation and offsetting measures for threatened species, including for matters of national environmental significance (MNES).

Potential Impact on MNES within the study area

The Proponent's revised Biodiversity Assessment Report (Appendix E, RtS) considered MNES under sections 18 and 18A of the EPBC Act that are known to occur or potentially occur in the project area. A summary of MNES assessed as potentially occurring in the study area is shown **in Table G1**.

The Protected Matters Search Tool (PMST) identified two EPBC Act listed TECs as potentially occurring within the construction footprint – Subtropical and Temperate Coastal Saltmarsh and Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland. A detailed MNES assessment for the project determined that about 0.63 hectares of the saltmarsh community in the construction footprint is consistent with the Subtropical and Temperate Coastal Saltmarsh TEC. However, impacts to the TEC would not be significant and would not require offsetting. The BAR

considered that the Coastal Swamp Oak Forest TEC did not meet size or condition threshold criteria for eligibility to be listed under the EPBC Act.

Table G1 | Summary of MNES potentially occurring in the study area (Source: RtS)

MNES under the EPBC Act	Number recorded or likely to occur within 10 km of the project	Number requiring detailed MNES assessment as described in the EIS BAR	Number impacted or potentially impacted by the refined construction footprint
Wetland of international importance (RAMSAR site)	One – Hunter Estuary Wetlands	NA	The wetlands occur about 6 km southeast of the proposed construction footprint. The project is unlikely to impact on the ecological character of the wetland.
Threatened Ecological Communities (TECs)	Six listed TECs	Two EPBC Act listed TECs were assessed against condition, composition, and area of coverage criteria in the BAR	One – Subtropical and Temperate Coastal Saltmarsh. Occurrences of Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland TEC in the footprint were not considered to meet size or condition criteria for listing under EPBC Act.
Threatened flora	21 species	Three EPBC Act listed species	Two EPBC Act listed species – *Persicaria elatior* and *Eucalyptus parramattensis* subsp. *decadens*.
Threatened fauna	53 species	Nine EPBC Act listed species	Nine species with a moderate to high likelihood of occurrence in the construction footprint – Koala, Regent Honeyeater, Swift Parrot, Grey-headed Flying-fox, Australasian Bittern, Australian Painted Snipe, Spotted-tailed Quoll, New Holland Mouse, and Green and Golden Bell Frog

The PMST identified 26 threatened flora species (or their habitats) in the 10-kilometre search radius around the construction footprint. Eleven of these species were considered to have moderate to high likelihood of occurring in the construction footprint and so were targeted by field surveys. This work confirmed the occurrence of two EPBC Act listed threatened flora species in the construction footprint – *Eucalyptus parramattensis* var. *decadens* and *Persicaria elatior* (**Table G2**).

Table G2 | BARs summary of MNES flora species with a moderate to high likelihood of occurring in the construction footprint (Source: RtS)

Threatened flora species listed under the EPBC Act	BAR assessment
Drooping Red Gum or Earp's Gum *Eucalyptus parramattensis* var. *decadens*	Thirty-four individuals of this species were recorded at the northern end of the construction footprint and on the eastern side of the existing highway. This is a localised occurrence of this species on atypical clay soils (normally occurs on sandy soils) suggesting the trees may have been planted during previous revegetation works on the Raymond Terrace Bypass in the 1980s. This group of trees is connected to the larger Tomago Sandbeds sub-population which would not be disturbed. The BAR concluded the project is unlikely to significantly impact this species, due mostly to the retention of the larger core population outside the construction footprint. However, the BAR did identify that under the FBA all species losses are required to be offset.
Tall Knotweed *Persicaria elatior*	A small, isolated population of three plants of this species was recorded in 2018 from a floodplain drainage line on the south side of Hunter River, within the

	construction footprint. The BAR concluded that little information exists to assess the impact of the project on this species. It suggested that further surveys after rainfall be undertaken to determine the full extent of the impact on this species in the locality. The BAR considered that there is potential for a local viable population of this species to occur in sandy swamp habitats east of the project area. Under the FBA, all species losses are required to be offset.
Small-flower Grevillea *Grevillea parviflora* subsp. *parviflora*	A population of 200 individuals was detected in a 4.3-hectare patch of Spotted Gum-Ironbark open forest between a cleared power easement and industrial land at Tomago. A link road was originally proposed to be constructed through this area but following EPBC Act referral this road is to be located to the west of this site thus avoiding the population. The BAR therefore considered that the project will not significantly impact this species in the construction footprint.

The PMST identified 53 threatened fauna species with habitat in the 10-kilometre search radius. The BAR identified that nine of these species were considered to have moderate to high likelihood of occurring in the construction footprint (**Table G3**) and so were targeted by field surveys. This work confirmed the occurrence of one EPBC Act listed threatened fauna species in the construction footprint – Grey-headed Flying-fox. The remaining eight species were derived from NSW BioNet records and the PMST.

Table G3 | BARs summary of MNES fauna species with a moderate to high likelihood of occurring in the construction footprint (Source: RtS)

Threatened fauna species listed under the EPBC Act	BAR assessment
Australasian Bittern *Botaurus poiciloptilus*	Suitable wetland habitat exists for this cryptic, part-nocturnal species in the locality. Although no individuals were recorded during project surveys, there have been 25 NSW BioNet records of this species in the locality. Detection is often by call (of males) in the spring-summer breeding season. Construction of the project may remove 43.74 hectares of suitable habitat of this species and may impact on future use of Windeyers Creek wetland as breeding habitat. The BAR concluded, however, that the project would be unlikely to have a significant impact on this species, given the availability of suitable foraging and breeding habitat in nearby Hunter Wetlands National Park and adjoining wetland sites.
Australian Painted Snipe *Rostratula australis*	Eleven records exist for this cryptic, part-migratory wetland species in the locality. No individuals were recorded during project surveys. Suitable wetland and wet pasture habitat occur for this species in the project area. The BAR considered that while the project may have minor impacts to the potential habitat of this species, significant adverse impacts would be unlikely.
Regent Honeyeater *Anthochaera Phrygia*	This critically endangered woodland bird species has been recorded once in the locality and has potential to occur due to the availability of suitable winter-flowering eucalypts. The BAR stated that there would be a small reduction in the extent of the species' non-breeding foraging habitat (Spotted Gum-Ironbark Forest, Grey Ironbark-Broad-leaved Mahogany-Forest Red Gum Open Forest and Banksia woodland). However, the BAR considered that the project would be unlikely to significantly impact on this species given the availability of suitable breeding and foraging resources in the core areas of this species' NSW range – Capertee Valley and Bundarra-Barraba on the northern tablelands.
Swift Parrot *Lathamus discolor*	The BAR considered that this species is likely to occur in the construction footprint due to the availability of suitable winter foraging habitat – flowering swamp mahogany, red bloodwood, swamp box and swamp paperbark. 9 records of this species exist in the locality. The project will cause a small reduction in the amount of foraging habitat of this species. The BAR concluded that the project would be unlikely to significantly impact on Swift Parrot habitat because of the lack of critical habitat and the availability of suitable habitat outside the construction footprint.

Spotted-tailed Quoll *Dasyurus maculatus*	Ten records of the quoll exist for the locality. The BAR considered that this species has moderate potential of occurring in the construction footprint due to extensive tracts of forest between Tomago and Heatherbrae and east to Williamtown and Nelson Bay. About 50 hectares of forest would be cleared along the western edge of this large expanse of forest. The BAR considered that the project would not significantly impact on the quoll because of the availability of extensive areas of forest habitat to the north and east of the footprint.
Grey-headed Flying-fox *Pteropus poliocephalus*	This species was recorded foraging in the construction footprint during surveys conducted for the project. No roost camps were detected within the footprint.109 records exist for this species in the locality. The BAR considered that there would be only minor impact on flying-fox critical foraging habitat. Foraging and breeding resources are available outside of the construction footprint. The BAR concluded the project would therefore not significantly impact on this species.
Koala *Phascolarctos cinereus*	1,985 records of this species exist within a 10-kilometre radius of the project area. Most of these occur outside the construction footprint, being focused east of the existing highway from Tomago to Heatherbrae and north of Raymond Terrace to Grahamstown Dam. Fewer records of this species occur at Black Hill. The clearing of 89.1 hectares in the northern sector of the construction footprint will remove Koala habitat food tree species. The BAR considered the project would have minimal impact on the Port Stephens Koala population because most of the core forest to the east and north of the construction footprint will not be impacted by the project. The BAR stated that the project was designed to avoid most potential Koala habitat between Tomago Road and Masonite Road by being located as close as possible to the existing highway in this area.
New Holland Mouse *Pseudomys novaehollandiae*	Thirty six records exist for this species in the locality. Suitable habitat for this species – Smooth-barked Apple-Blackbutt sandy open forest – occurs adjacent to and between Hunter Region Botanic Gardens and Masonite Road at Heatherbrae. The BAR considered that the project's proposed removal of 28.6 hectares of this habitat would not significantly adversely impact on this species because of the availability of suitable forest habitat from Tomago Sandbeds east to Salt Ash.
Green and Golden Bell Frog *Litoria aurea*	Suitable wetland habitat for this species occurs in Hunter Wetlands National Park, 2-3 kilometres south of the construction footprint where most of the 3,954 records have been obtained. Surveys conducted between 2016 and 2018 detected individuals calling in reference sites near, but not within, the construction footprint. The project will impact about 49 hectares of grassy meadow habitat and 7.7 hectares of Typha rushland. The BAR concluded that the project is unlikely to reduce the species' population size or lower its reproductive success, particularly given the absence of a known bell frog population in the construction footprint and the availability of suitable wetland habitat nearby.

M.1 REQUIREMENTS FOR DECISIONS ABOUT THREATENED SPECIES AND ENDANGERED ECOLOGICAL COMMUNITIES

In accordance with Section 136 of the EPBC Act, in deciding whether or not to approve the taking of an action and what conditions to attach to an approval, the Minister must consider matters relevant to any matter protected by a provision of Part 3 that the Minister has decided is a controlling provision for the action. These matters are addressed in **Table G4** of this report on MNES.

In accordance with section 139 of the EPBC Act, in deciding whether or not to approve, for the purposes of section 18 or section 18A of the EPBC Act, the taking of an action and what conditions to attach to such an approval, the Minister must not act inconsistently with certain international environmental obligations, Recovery Plans or Threat Abatement Plans. The Minister must also have regard to relevant approved Conservation Advices.

Australia's International Obligations

Australia's obligations under the *Convention on Biological Diversity* (Biodiversity Convention) include the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

The recommendations of the Biodiversity Assessment Report (BAR) (as updated by the BAR in the RtS dated June 2022) and this assessment report are not inconsistent with the Biodiversity Convention, which promotes environmental impact assessment (such as this process) to avoid and minimise adverse impacts on biological diversity. The recommended approval requires avoidance, mitigation and management measures, and offsetting for the listed threatened species and communities. In addition, all information related to the proposed action is required to be publicly available to ensure equitable sharing of information and improved knowledge relating to biodiversity.

Australia's obligations under the *Convention on Conservation of Nature in the South Pacific* (APIA Convention) include encouraging the creation of protected areas which together with existing protected areas will safeguard representative samples of the natural ecosystems occurring therein (particular attention being given to endangered species), as well as superlative scenery, striking geological formations and regions. Additional obligations include using their best endeavours to protect such fauna and flora (special attention being given to migratory species) so as to safeguard them from unwise exploitation and other threats that may lead to their extinction. The APIA Convention was suspended with effect from 13 September 2006. While this Convention has been suspended, Australia's obligations under the APIA Convention have been taken into consideration. The recommendations are not inconsistent with the APIA Convention which has the general aim of conservation of biodiversity.

The *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) is an international agreement between governments which seeks to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The recommendations are not inconsistent with CITES as the proposed action does not involve international trade in specimens of wild animals and plants.

Recovery Plans and Approved Conservation Advices

There are Approved Conservation Advices for the following communities and species that will be impacted by the project: Tall Knotweed (*Persicaria elatior*); Australian Painted Snipe (*Rostratula australis*); Australasian Bittern (*Botaurus poiciloptilus*); New Holland Mouse (*Pseudomys novaehollandiae*); Green and Golden Bell Frog (*Litoria aurea*)*;* Drooping Red Gum / Earp's Gum (*Eucalyptus parramattensis var. decadens); and Uperoleia mahonyi* — Mahony's Toadlet.

There are approved Conservation Advice and Recovery Plans for:

- *Phascolarctos cinereus* (Koala) (combined populations of Queensland, NSW, and the ACT)
- *Lathamus discolor* (Swift Parrot)
- *Anthochaera phrygia* (Regent Honeyeater)
- *Dasyurus maculatus* (Spotted-tailed Quoll)

There is no Conservation Advice for the *Pteropus poliocephalus* (Grey-headed Flying-fox), however there is a Recovery Plan for the species.

There are draft Recovery Plans for the Australasian Bittern and Green and Golden Bell Frog.

The Proponent considered the above Recovery Plans and Approved Conservation Advice in its assessment of significance as part of the revised BAR. The Department has considered the revised BAR and the following provides the Department's assessment of the applicable Recovery Plans and Approved Conservation Advices for the relevant threatened ecological community and species.

It should be noted that under the *NSW Biodiversity Offsets Policy for Major Projects,* Proponents are required to avoid and minimise impacts on biodiversity. When all feasible measures have been taken to avoid and minimise the impacts, offsets are to be used to compensate for any remaining (residual) impacts regardless of the level of significance of impact. The methods for assessing residual impacts and determining offset requirements are set out in the NSW *Framework for Biodiversity Assessment.*

- ***Persicaria elatior* (Tall Knotweed)**

The conservation advice was approved on 1 October 2010 and indicates the threatened flora species is known to occur in the North Coast, Central Coast, and South Coast of NSW. The main threats are damage to populations from road and track maintenance activities and clearing and hydrological changes to wetlands. The project directly impacts upon three individuals of the threatened flora species. Impacts to these individuals cannot be avoided and although the loss will not impact the viability of the species, under the FBA the removal of the three plants generates species credits which will need to be retired as part of the offsetting process. The Department considers the residual impacts will be acceptable as they will be offset.

- ***Rostratula australis* (Australian Painted Snipe)**

The conservation advice was approved on 30 May 2013 and identified the endangered fauna species is widespread and is not considered to have a limited geographic distribution. Its current extent of occurrence is estimated to be 7,100,000 km^2, including the Murray-Darling Basin (particularly the Riverina of Victoria and New South Wales), Queensland Channel Country, Fitzroy Basin of Central Queensland, south-eastern South Australia and adjacent parts of Victoria. The main identified threats to the species are the loss and degradation of wetlands, grazing and the associated trampling of wetland vegetation/nests, and feral animals.

The BAR indicates that there are few records of the Australian Painted Snipe in the locality, but the species may occasionally visit wetlands and floodplains associated with the Hexham Swamp and Hunter River floodplain in areas affected by the proposed action. The project would remove 43.74 ha of low condition freshwater wetland habitat in the form of ephemeral marshy and grassed habitat. It is noted that the quality of potential wetland habitats within the construction footprint is generally low to moderate as a result of a long history of cattle grazing.

The BAR stated that these habitats would not support an ecologically significant proportion of the Australian Painted Snipe population, however, may be visited occasionally. The habitat adjoins large areas of contiguous wetland within the coastal wetland and Hexham Swamp Nature Reserve that may also be used by the species. Due to the low to moderate quality of habitat impacted by the project it is considered that clearing would not lead to a long-term decrease in the size of the Painted Snipe population and not result in a significant impact as there is wider higher habitat available in the wider Hexham and Kooragang area.

Although the impact to this species is considered to not have a significant impact under the EPBC Act, the Department notes that the clearing of the associated PCTs would require ecosystem offset requirements under the NSW Biodiversity Offsets Policy for Major Projects and the FBA.

- ***Botaurus poiciloptilus (Australasian Bittern)***

The conservation advice was approved on 18 January 2019 and identified the endangered fauna species occurs from south-east Queensland to south-east South Australia, Tasmania and the south-west of Western Australia. This species known in NSW to occur along the coast and in floodplain wetlands of inland rivers. The main identified threats to the species include habitat loss through water diversion, drainage of swamps, and clearing for development.

The project would clear 43.74 ha of associated habitat across the construction footprint, with around five hectares of high-quality habitat at Windeyers Creek, which may be considered critical to the survival of the species. The species was confirmed at this location in 1999, although there are no recent records, which would indicate that the habitat is critical to the survival of an individual or established pairs. Impact to this community cannot be avoided and is considered significant. To address this impact, the Proponent will be required to provide species credits in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the FBA to offset impacts to this species.

Although the actions listed in the *draft National Recovery Plan for the Australasian Bittern Botaurus poiciloptilus* (2019) are largely not applicable to the project, the plan does however make reference to the undertaking of wetland restoration activities (action 2e under strategy 2), to create suitable habitats. It is noted that NSW State Agencies (DPI Fisheries, Local Land Services and DPE Water (Hunter Valley Flood Mitigation Scheme team)) all expressed an interest in restoring tidal flows and rehabilitating floodplain land either side of the Hunter River that is owned by the Proponent. The land (as shown in **Figure 28**, of **Section 6.4** of the Department's assessment report) has been identified as surplus to the project's operational requirements, and the Proponent has committed to liaise with DPI Fisheries and Local Land Services and DPE Water (Hunter Valley Flood Mitigation team) prior to the planned disposal of the residue properties. The Department supports this process and has recommended a condition that requires the Proponent to liaise with DPI Fisheries, Local Land Services and DPE Water (Hunter Valley Flood Mitigation team) six months prior to disposal of the surplus land to ascertain if the agencies have an interest in purchasing the land. This will ensure that if investigative studies by these agencies deem floodplain restoration is a viable option they can apply to obtain the properties before the land is placed on the open market.

- ***Pseudomys novaehollandiae (New Holland Mouse)***

The conservation advice was approved on 14 July 2010 and identified the vulnerable fauna species occurring in fragments throughout Tasmania, Victoria, New South Wales and Queensland. It is known to inhabit open heathlands, woodlands and vegetated sand dunes. Although the species was not identified during surveys for this project, the BAR concluded that it is considered moderately likely to occur within the construction footprint based on the presence of suitable habitat.

The main identified threats include loss of habitat through land development, weed invasion, predators and inappropriate fire management. Although the project has been designed to minimise vegetation loss by placing the route on the edge of the forested habitat owned by Hunter Water Corporation between the Botanic Gardens and Heatherbrae, the project will clear 28.60 hectares of potential suitable habitat. However, this habitat does not meet the requirements of being habitat critical to the survival of a species under the EPBC Act.

As the project will not impact any critical habitat associated with the survival of the species, it is considered the project will not have a significant impact on the species and no further actions or offsetting requirements are required.

- ***Litoria aurea* (Green and Golden Bell Frog)**

The conservation advice was approved on 11 April 2014. The vulnerable fauna species occurs from the Yuraygir National Park on the NSW North Coast to Lake Tyers in Victoria. The main identified threats to the species include habitat destruction, fragmentation, predation of eggs and tadpoles, changes to hydrology and water quality.

The project will directly impact upon 49 hectares of grassy meadow and 7.7 hectares of Tyhpa rushland which are potential habitat for the frog. However, there are no known records of the Green and Golden Bell Frog within the construction footprint or within the study area. The (draft) *Green and Golden Bell Frog Recovery Plan Litoria aurea (Lesson 1829) Recovery Plan* (2005) focuses on maintaining key populations across the species range and no net loss of habitat at key populations and as such the actions are not applicable to the project.

- ***Phascolarctos cinereus* (Koala) (combined populations of Queensland, NSW, and the ACT)**

The conservation advice came into effect on 12 February 2022. The engendered[11] fauna species occurs throughout eastern Australian forests and woodlands in an area of 1,665,850 km^2. The main identified threats to the species include bushfire and drought events, disease, land clearing and a shrinking climatically suitable area. The project will directly impact upon 89.1 ha of habitat with primary food tree species.

The document *National Recovery Plan for the Koala Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory)* was published in March 2022. Transport corridors are identified as a direct threat in the Plan. Although the project will require removal of approximately 89.1 hectares of habitat, there is no evidence of frequent use of the habitat by the species within the project area. The project is considered to significantly impact the koala through the removal of habitat, however, under the State assessment process this is being offset by the retirement of 'species credits for the Koala, specifically for the 89.1 hectares of core foraging habitat. Additionally, a number of the ecosystem credits to be retired would also account for secondary browse trees and movement habitat.

One of the actions of the Recovery Plan is to implement on-ground revegetation or restoration programs in previously cleared areas of Koala habitat. There are current opportunities for Koalas to cross the existing Pacific Highway to the immediate north of the proposed action and the construction footprint does not isolate a significant area of habitat or disrupt apparent important landscape links for this species. Fauna connectivity and management measures have been prepared as part of the revised BAR (see Chapter 9) for the proposed action, which identifies additional measures to ensure that Koalas do not enter the road corridor and that suitable connectivity is provided where movement opportunities may occur. Further, the Proponent does not propose to revegetate the road corridor with suitable habitat vegetation as this would encourage Koalas to feed and reside in the corridor and thereby increase the risk of strike by vehicles.

[11] At the time of EPBC Act controlled action referral the Koala was listed as vulnerable at the time of the referral.

Although the objectives of revegetation of suitable habitat will not be provided to meet the requirements of the recovery plan, the Department considers the project has been designed to avoid Koala habitat as far as practicable. Given the avoidance and mitigation measures set out in the EIS, RTS and conditions of approval, it is considered that the proposed offset requirements compensate for the residual impacts on the Koala.

- ***Lathamus discolor* (Swift Parrot)**

The conservation advice was approved on 5 May 2016. The critically endangered fauna species breeds in Tasmania and is found throughout Victoria and New South Wales. The main identified threats to the species include habitat loss, predation by sugar gliders and diseases. The project will result in limited impact to suitable habitat as it is not considered critical habitat and the provision of suitable habitat around the project footprint. The impact to habitat would not adversely impact the species because of adjoining suitable habitat. The recovery actions in the *National Recovery Plan for the Swift Parrot Lathamus discolor* (2011) are largely not applicable to the proposed action and as clearing for the project will have only a limited impact on habitat, it will not interfere with the recovery of the Swift Parrot.

- ***Anthochaera phrygia* (Regent Honeyeater)**

The conservation advice was approved on 25 June 2015. The critically endangered fauna species is found throughout NSW, Queensland, ACT and Victoria. The main identified threats to the species include habitat loss, clearing and fragmentation. The project will clear around 82 hectares of potential foraging habitat in the construction footprint. This impact is considered unlikely to lead to a long-term decrease in the size of the Regent Honeyeater population as the proposed action will not impact on the critical remaining strongholds of the species or an area of known important habitat for breeding or foraging. Further, the project is unlikely to impact upon the species due to the wide-spread availability of breeding and foraging habitat in the key areas that the species is found (notably the Northern Tablelands of NSW). The recovery actions listed in the *Regent Honeyeater Recovery Plan 1999-2003* (1999) are largely not applicable to the proposed project and as such, delivery of the project will not interfere with the recovery of this species.

After consideration of the factors above, an overall conclusion has been made that the project is unlikely to result in a significant impact to the Regent Honeyeater. However, impacts to the potential habitat of this species were quantified in the BAR and the PCTs associated with this habitat would be offset in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the FBA.

- ***Dasyurus maculatus* (Spotted-tailed Quoll)**

The conservation advice was approved on 1 September 2020. The endangered fauna species is found from south-eastern Queensland to western Victoria. The main identified threats to the species include habitat loss, road traffic mortalities and invasive species. The project will impact 50 hectares of habitat, however the assessment has identified that the impacts would not significantly impact the species.

The key action in the *National Recovery Plan for the Spotted-tailed Quoll Dasyurus maculatus* (2016) applicable to the project is implementation of mitigation measures at road-kill hotspots. To meet the requirements of the *National Recovery Plan,* the Proponent has proposed fauna exclusion fencing along most vegetated areas along the project alignment to deter fauna from getting onto the new motorway.

- ***Pteropus poliocephalus (Grey-headed Flying-fox)***

The Department has considered the National Recovery Plan, as there is no approved Conservation Advice. The National Recovery Plan notes the primary known threat to the survival of the Grey-headed Flying-fox is loss and degradation of foraging and roosting habitat. The project would clear up to 83.4 ha of potential foraging habitat based on associated PCTs and habitat modelling data for the locality. There are no roost camps in the construction footprint and the project will not impact on any known permanent roosting, breeding / maternity site. Therefore, it is likely that the impacts of the project would be confined to loss of foraging resources caused by direct clearing or damage to native vegetation during the construction phase. There is also a low risk of vehicle strike during operation.

It is considered the project will not interfere with the recovery of the Grey-headed Flying-fox and will not contribute to the key threats to this species. After consideration of the factors above, an overall conclusion has been made that the proposed action is unlikely to result in a significant impact to the Grey-headed Flying-fox. However, impacts to the potential habitat of this species were quantified in the BAR and the PCTs associated with this habitat would be offset in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the FBA.

- ***Drooping Red Gum / Earp's Gum (Eucalyptus parramattensis* var*. decadens)***

The Conservation Advice was approved on 11 April 2014 and identified the main threats to this species is habitat loss, disturbance and modification, invasive weeds and fires.

The current design of an off-ramp at the northern end of the project would remove 34 individuals of this species, however this is based on a worst-case footprint and some individuals may remain following detailed design. Due to the small numbers of spread of this species in this location, the BAR concluded the trees may have been planted during previous revegetation works on the Raymond Terrace Bypass in the 1980s as habitat for this species is primarily located to the east towards Williamtown and connected to the large Tomago Sandbeds sub-population of E. *parramattensis subsp. decadens*.

The impact to the trees is not considered significant but under the FBA, species removal generates species credits which will need to be retired. The Department has recommended conditions that require the Proponent to reduce its clearing impacts on vegetation. Any reduction to the impacts to this species could also result in the Proponent's offset liabilities being reduced subject to reflect the final construction footprint and resulting extent and type of plant community types to be cleared and the extent of threatened species habitat impacted by the construction of the project. Amendments to the ecosystem credit requirements must be undertaken in consultation with and endorsed by EHG (BCD) and DCCEEW and submitted to the Planning Secretary for approval.

- ***Uperoleia mahonyi* — Mahony's Toadlet**[12]

Conservation advice for this species was approved on 3 March 2021. The species is listed as being endangered and faces a range of threats including habitat loss, habitat degradation and disease. Around 3.1 hectares of an available 72 hectares of habitat would be removed (around 4.5 per cent)

[12] Mahony's Toadlet was listed under the EPBC Act in March 2021. In accordance with section 158A of the EPBC Act, listings and uplistings after the controlled action decision (for M1 that was 14 Jan 2019). Therefore impacts to Mahony's Toadlet cannot be considered as part of the EPBC Act approval decision for the proposed action.

within the 1,500 metre landscape buffer. It is noted that habitat is widespread for this species and the extent of the population unknown with no species being recorded in the study area during surveys.

According to the NSW scientific determination for this species a total of around 18,000 hectares of potentially suitable habitat occurs in reserves in coastal NSW. The project would remove PCTs / habitats that contain plant species and characteristics know to be important for Mahony's Toadlet. Any significant residual impacts associated with this habitat loss will be offset in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the FBA.

Threat Abatement Plans

The Threat Abatement Plans (TAPs) relevant to this action are discussed below and are available at http://www.environment.gov.au/biodiversity/threatened/threat-abatement-plans/approved

- **Threat abatement plan for predation by feral cats (relevant to Australasian Bittern *Botaurus poiciloptilus*, Spotted-tailed Quoll *Dasyurus maculatus*, New Holland Mouse *Pseudomys novaehollandiae*, and Green and Golden Bell Frog *Litoria aurea*) and Threat abatement plan for predation by the European red fox (relevant to Australasian Bittern *Botaurus poiciloptilus*, Spotted-tailed Quoll *Dasyurus maculatus*, and Green and Golden Bell Frog *Litoria aurea*)**

Foxes and feral cats are significant predators in Australia that interact with native fauna in various ways, including predation, competition of resources and transmission of disease. The TAPs for both predators aim to minimise their impacts on biodiversity by protecting affected threatened species and preventing further species and ecological communities becoming threatened. Construction of linear infrastructure through large patches of intact vegetation can result in the establishment of pest species (particularly predators such as foxes and cats) into areas where they are currently absent or in low numbers.

Measures to control feral animals can be addressed through construction and operational management plans.

Therefore, the Department considers the approval of the action would not be inconsistent with the TAP for predation by feral cats.

- **Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomic* (relevant to New Holland Mouse *Pseudomys novaehollandiae*)**

Phytophthora cinnamomic (*P. cinnamomi*) is a microscopic soil-borne organism that has the ability to cause plant disease and plant death. It is within a group currently referred to as water mould and interferes with the movement of water and nutrients within the roots of plants. It can be spread in water, soil or plant material that contains pathogen and dispersal is favoured by moist or wet conditions. It can be carried in both overland and subsurface water flows and spread by native and feral animals. Humans, however, have the capacity to disturb and transport more soil than any other vector. Most of the large centres of infestation that exist today in southern temperate Australia occurred as a result of human activity, often as a direct result of the introduction of infected soil or road-building materials to vulnerable un-infected areas.

P. cinnamomi is not a threat to plant communities on the NSW North Coast as cases of *Phytophthora* dieback are rarely reported from this region (Benwell, 2013).

Infection of native plants by *P. cinnamomi* can be mitigated through the development and implementation of suitable control measures for vehicle and plant hygiene and is unlikely to have a significant impact. The Proponent has committed to using current best practice hygiene protocols and these would be documented in the Flora and Fauna Construction Environmental Management Plan Sub-Plan (FFCEMP) to prevent the introduction or spread of pathogens.

Subject to the introduction of hygiene protocols within the CFFMP and the reduced risk of infection in the area, the Department considers that approval of the proposed action would not be inconsistent with the TAP for disease in natural ecosystems caused by *P. cinnamomi.*

- **Threat abatement plan for infection of amphibians with chytrid fungus resulting in chytridiomycosis (relevant to Green and Golden Bell Frog *Litoria aurea*)**

Chytridiomycosis is an infectious disease affecting amphibian populations. The disease is caused by a pathogenic fungus, *Batrachochytrium dendrobatidis*, known as amphibian chytrid fungus. The chytrid fungus occupies a zone in eastern Australia from North Queensland to Melbourne in Victoria. The chytrid fungus can spread independently or with the assistance of amphibians and is endemic in NSW populations of Green and Golden Bell Frogs. The TAP aims to minimise the impact of chytridiomycosis on Australian amphibian populations and has goals to prevent amphibian populations or regions that are chytridiomycosis free from becoming infected and to decrease the impact of infection of the amphibian chytrid fungus on populations that are currently infected.

The Proponent has committed to implementing hygiene protocols during construction, however there have been no records of Green and Golden Bell Frogs within the construction footprint or study area. Subject to the introduction of hygiene protocols, the Department considers that approval of the proposed action would not be inconsistent with the TAP for infection of amphibians with chytrid fungus.

M.2 REQUIREMENTS FOR DECISIONS ABOUT WORLD HERITAGE PROPERTIES

The Commonwealth determined that the action is not a controlled action for the controlling provision of World Heritage (Section 12 and Section 15A of the EPBC Act) and therefore further consideration is not required.

M.3 REQUIREMENTS FOR DECISIONS ABOUT NATIONAL HERITAGE PLACES

The Commonwealth determined that the action is not a controlled action for the controlling provision of National Heritage (Section 15B and Section 15C of the EPBC Act) and therefore further consideration is not required.

M.4 ADDITIONAL EPBC ACT CONSIDERATIONS

Table G4 sets out the additional mandatory considerations, factors to be taken into account and factors to have regard under the EPBC Act, additional to those already discussed, which the Commonwealth Minister must consider in determining the proposed action.

Table G4 | Additional considerations for the Commonwealth Minister under the EPBC Act

EPBC Act section	Considerations	Conclusion
Mandatory considerations		
136(1)(b)	Social and economic matters are discussed in **Section 6.4** of the assessment report.	The Department considers that the project would result in a range of benefits to State and regional economy through improvements in the efficiency of the inter- and intra-state road freight network.
Factors to be taken into account		
3A, 391(2)	Principles of ecologically sustainable development (ESD), including the precautionary principle, have been taken into account, particularly: • the long-term and short-term economic, environmental, social and equitable considerations that are relevant to this decision • conditions that restrict environmental impacts and impose monitoring and adaptive management reduce any lack of certainty related to the potential impacts of the project • conditions requiring the project to be delivered and operate in a sustainable way to protect the environment for future generations and conserving the relevant matters of national environmental significance • advice provided within this report reflects the importance of conserving biological diversity and ecological integrity in relation to the controlling provisions for the project • mitigation measures to be implemented which minimise potential impacts of the project on biodiversity within the project area.	The Department considers that the project, if undertaken in accordance with the recommended conditions of approval, would be consistent with the principles of ESD. **Section 4.3** of the assessment report addresses the project in regard to ESD principles.
136(2)(e)	Other information on the relevant impacts of the proposed action – the Department is not aware of any relevant information not addressed in this assessment report.	The Department considers that all information relevant to the impacts of the project have been taken into account in this assessment. The Department's consideration on key issues is presented in **Section 6** of the assessment report.
Factors to have regard to		
176(5)	Bioregional plans	There is no relevant bioregional plan.
Consideration on deciding conditions		
134(4)	Must consider: • information provided by the person proposing to take the action or by the designated proponent of the action; and	All project related documentation is available at the Department's website www.majorprojects.planning.nsw.gov.au.

• the desirability of ensuring as far as practicable that the condition(s) is a cost-effective means for the Commonwealth and a person taking the action to achieve the object of the condition.	The Department considers that the recommended conditions at **Appendix C** – Submissions are a cost-effective means of achieving their purpose.

M.5 CONCLUSIONS ON CONTROLLING PROVISIONS

Threatened species (Sections 18 and 18A of the Act)

For the reasons set out in **Section 6.4** (of the assessment report) and this Appendix, the Department recommends that the impacts of the action on threatened species will be acceptable, subject to the implementation of the avoidance and mitigation measures described in the EIS, RtS and the requirements of the recommended conditions.

M.6 OTHER PROTECTED MATTERS

The Commonwealth Department of Climate Change, Energy, the Environment and Water determined that other matters under the EPBC Act are not controlling provisions with respect to the proposed action. These include listed migratory species, RAMSAR wetlands, Commonwealth marine environment, world heritage properties, national heritage places, nuclear action, Great Barrier Reef Marine Park and a water resource associated with a large coal mining or coal seam development.

Appendix H – Specialist Independent Flood Assessment

Appendix I – Recommended Instrument of Approval