

Inland Rail Narrabri to North Star Phase 1

**State Significant
Infrastructure
Assessment
(SSI 7474)**

August 2020

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Cover photo

View of the rail corridor (ARTC)

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Glossary

Abbreviation	Definition
AEP	Annual Exceedance Probability
ARR	<i>Australian Rainfall and Runoff</i> (Commonwealth of Australia, 2019)
Approval	Minister's Approval
ARTC	Australian Rail Track Corporation (the Proponent)
CSSI	Critical State Significant Infrastructure
Department	NSW Department of Planning, Industry and Environment
DPIE EES Group	Environment, Energy and Science Group of the Department
DPIE Water Group	Water Group of the Department
EIS	Environmental Impact Statement for the project prepared for the Proponent and dated 3 November 2017
EPA	Environment Protection Authority of NSW
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
FBA	<i>Framework for Biodiversity Assessment</i> (OEH, 2014)
FMO	Flood management objective
IBRA	Interim Biogeographic Regionalisation for Australia
ICNG	<i>Interim Construction Noise Guideline</i> (DECC, 2009)
LGA	Local government area
Minister	Minister for Planning and Public Spaces
MNES	Matter of national environmental significance
NML	Noise Management Level
Planning Secretary	Secretary of the Department
Proponent	Australian Rail Track Corporation (ARTC)
RAP	Registered Aboriginal Party
RING	<i>Rail Infrastructure Noise Guideline</i> (EPA, 2013)
SAP	Special Activation Precinct
SEARs	Secretary's environmental assessment requirements
SPIR	Submissions and Preferred Infrastructure Report prepared for the Proponent and dated 11 December 2019
SSI	State Significant Infrastructure
Response to Submissions Report	Submissions Report for the proposal prepared by the Proponent and dated 26 May 2020
TfNSW	Transport for NSW



Executive Summary

The Australian Rail Track Corporation (ARTC) is constructing the Inland Rail project, a 1,700 kilometre freight rail line between Melbourne and Brisbane. The Narrabri to North Star Phase 1 critical State significant infrastructure (CSSI) project is one of eight Inland Rail projects in NSW. This stage proposes to upgrade approximately 173 kilometres of existing rail line and associated facilities between Narrabri and North Star in north west NSW. The project will consist of two non-contiguous sections: Narrabri to Moree and Camurra to North Star. The upgrade from Moree to Camurra will be the subject of a separate CSSI application (Phase 2).

Inland Rail will provide economic benefits to NSW and the nation. Inland Rail's business case indicates it will increase gross domestic product by \$16 billion over the 10-year construction period and 50 years of operation. Narrabri to North Star Stage 1 has a Capital Investment Value of approximately \$700 million and will create an average of 500 jobs during construction.

The Narrabri to North Star Phase 1 project will provide economic growth in north-west NSW and development opportunities in the region through the improved reliability, efficiency and capacity of rail freight transport provided by this section of the Inland Rail project.

The Department considers that the environmental impacts of construction and operation are acceptable subject to implementation of appropriate mitigation and management measures. The benefits of the project will outweigh localised impacts. It is in the public interest that the proposal is approved.

The proposal complies with the objects of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and is consistent with the Government's key priorities and transport planning framework including *NSW Freight and Ports Plan 2018-2038*, *2020 Infrastructure Priority List*, *NSW State Infrastructure Strategy 2018-2038*, *Future Transport Strategy 2056*, and *Regional NSW Service and Infrastructure Plan*. The Minister for Planning and Public Spaces is the approval authority.

The Commonwealth Department of the Environment and Energy (now Department of Agriculture, Water and the Environment) determined the proposal to be a 'controlled action' under sections 18 and 18A *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), as it was considered likely that the proposal could have a significant impact on listed threatened species and communities. Following this notification, the Department confirmed that the proposal would be assessed under the NSW Assessment Bilateral Agreement.

Engagement with the Community

The Environmental Impact Statement (EIS) was publicly exhibited from 15 November 2017 until 15 December 2017 (31 days) on the Department's website. Eighteen submissions were received during the exhibition period. Two were received from local councils, six from government agencies and ten from the community, including seven from individuals and three from special interest groups. Two

objections were received, both from the community. Key issues raised in the submissions included construction and operational noise, traffic and transport, flooding, and farm access and operations.

ARTC amended the project to exclude the Mehi-Gwydir floodplain in Moree and provided a Submissions and Preferred Infrastructure Report (SPIR) detailing project amendments and responding to submissions. The SPIR was exhibited from Wednesday 11 December 2019 until Friday 31 January 2020 (52 days). Nine submissions were received: seven from government agencies and two from councils. The key issues raised included biodiversity, flooding and the location of the proposed road bridge over the rail line in Moree.

Key Assessment Issues

Biodiversity

The project will directly impact ecological communities identified under the *Biodiversity Conservation Act 2016* and the Commonwealth EPBC Act. It will impact 890 hectares (ha) of native vegetation, including 175 ha of koala habitat.

Although the project removes habitat for the koala and a number of other threatened fauna species, the Department considers that the provision of ecosystems and species credits will offset the vegetation and koala habitat impacts of the proposal. The impacts to these habitats would be offset in accordance with the Framework for Biodiversity Assessment.

The Department considers that the impacts of the project on matters of national environmental significance have been adequately addressed by the Proponent. The Department is satisfied that biodiversity impacts cannot be further avoided and will be appropriately offset.

Flooding and hydrology

The proposal will raise the level of the existing rail line to improve its flood immunity. This will increase flood levels on some surrounding areas and alter flooding behaviour along the alignment. The Department engaged an independent hydrologist to review the proposal and make recommendations on the hydrology assessment. The Department's assessment finds that the proposal will generally retain existing water flow paths within the modelled range of flood events but will increase the depth and duration of flooding in some areas. This would impact residences, roads, and farms.

Noting the anticipated impacts, the Department does not accept all of the Proponent's flood management objectives and set stringent flood design limits on the advice of its independent hydrologist. These limits will minimise negative flooding impacts of the proposal. The Department recommends conditions of approval requiring the flooding and hydrology impacts are further assessed against the flood design limits and this assessment is subject to an independent peer review. Subject to demonstrated compliance with the Department's design limits, the Department is satisfied with the proposal's flooding and hydrology outcomes.

Noise and Vibration

Noise and vibration impacts are expected during construction and operation, particularly along the rail corridor where it bisects towns and villages. Construction noise will affect an estimated 1840 sensitive receivers, and 87 will experience operational noise exceeding relevant guidelines. Only three receivers

will be highly noise affected by construction works, and the Proponent has committed to mitigating operational noise to reduce it below guideline levels.

The Department has recommended several conditions to mitigate impacts. Construction measures include consultation with residents and respite periods for highly noisy activities. An Operational Noise and Vibration Review will confirm where operational noise treatments will be required. These treatments will be implemented after landowner consultation during the early stages of construction to assist in addressing construction noise impacts.

Traffic, transport and access

The Department is satisfied that the construction and operation of the proposal will not cause significant impacts on the Newell Highway or local roads. Recommended conditions of approval require that the Proponent consult with landowners and reach agreement on level crossing closures and changes to property access.

The Department notes Moree Plains Shire Council's position that the proposed Jones Avenue bridge in Moree should be relocated to better support future freight and logistics development to the south of Moree as part of the Moree Special Activation Precinct (Moree SAP). The Proponent has committed to investigating relocating the bridge, and the Department recommends a condition requiring a Transport Network and Connectivity Analysis that provides a framework for this investigation and potential relocation.



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1. *Introduction*

The Australian Rail Track Corporation (ARTC) proposes to construct the Narrabri to North Star Phase 1 Critical State significant infrastructure (CSSI) project rail upgrade. The project will upgrade approximately 173 kilometres of existing rail line and associated facilities between Narrabri and North Star in north west NSW. The project will consist of two non-contiguous sections: Narrabri to Moree and Camurra to North Star (**Figure 1**). The upgrade from Moree to Camurra will be the subject of a separate CSSI application (Phase 2). Splitting the project will allow ARTC additional time to complete flood assessments of the Mehi - Gwydir River floodplain to the north of Moree.

The route is within the Narrabri, Moree Plains and Gwydir Local Government Areas (LGAs) in north west NSW. The three LGAs are predominantly rural, with the main local industries based around agriculture, extractive industries, and related services. The main towns in or near the route alignment are Narrabri and Moree, and the project passes through the smaller villages of Bellata, Gurley, Croppa Creek and North Star.

Narrabri to North Star Phase 1 is one of eight Inland Rail projects in NSW. Inland Rail is a series of freight rail projects that will form a 1,700-kilometre high-capacity freight rail network between Melbourne and Brisbane. The broader project is expected to be operational by 2025. The Narrabri to North Star Phase 1 proposal is the second component (after the under-construction Parkes to Narromine section) of the overall Inland Rail project to be delivered within NSW.

ARTC anticipates that by 2040 Inland Rail will carry 15 double container stacked trains per day with an average estimated 8.5 trains per day in 2025. The trains would be up to 1,800 metres long and carry a mix of grain, bulk and containerised freight. Total annual freight tonnages are expected to be about 11.8 million tonnes in 2025, increasing to about 19 million tonnes in 2040 (compared to the existing two million tonnes of grain per year). Operation of Inland Rail between Narrabri and North Star would involve an average of about 10 trains per day at opening in 2025 and 20 trains per day by 2040.

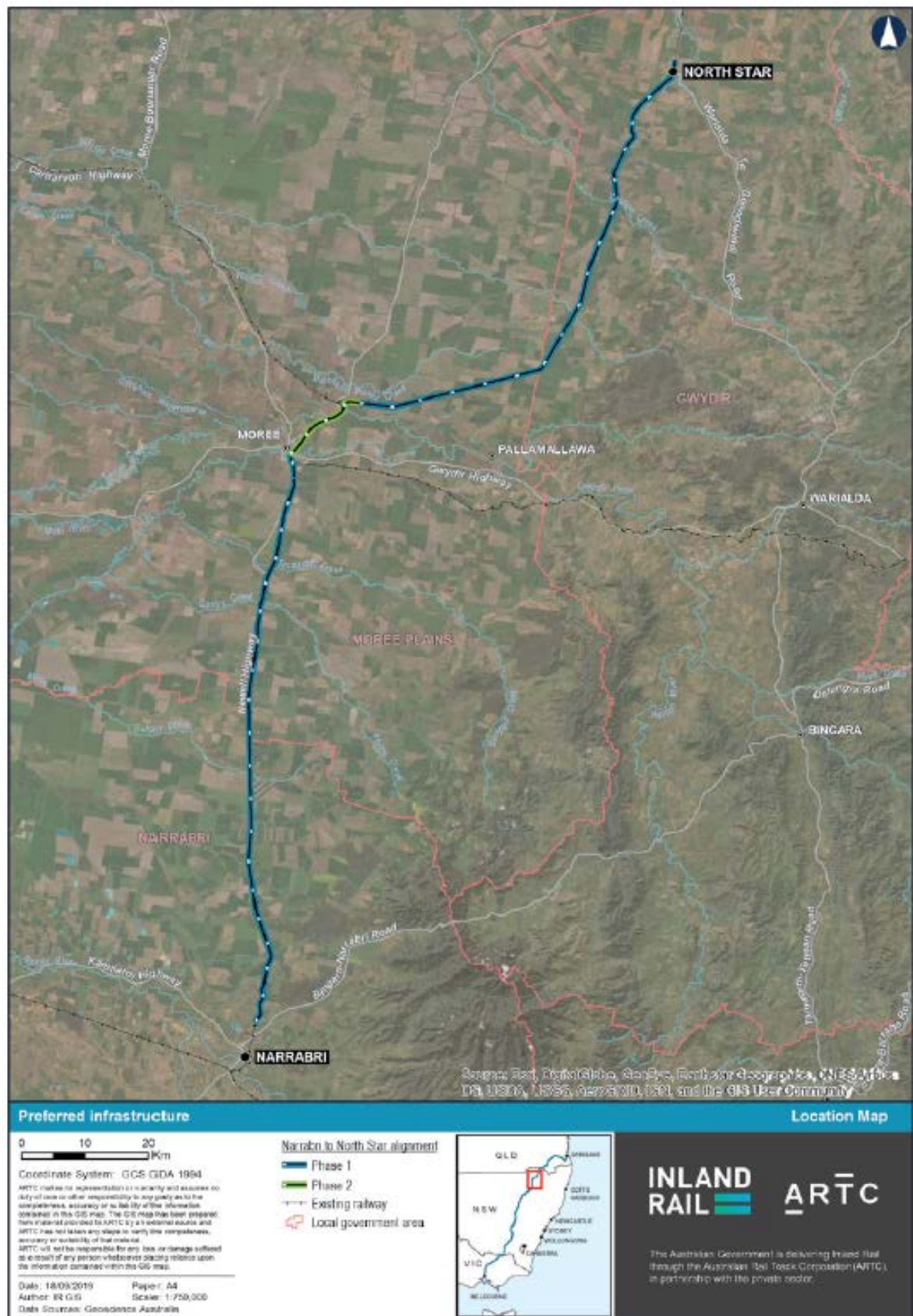


Figure 1 | Project location (Source: SPIR)

INLAND RAIL ALIGNMENT

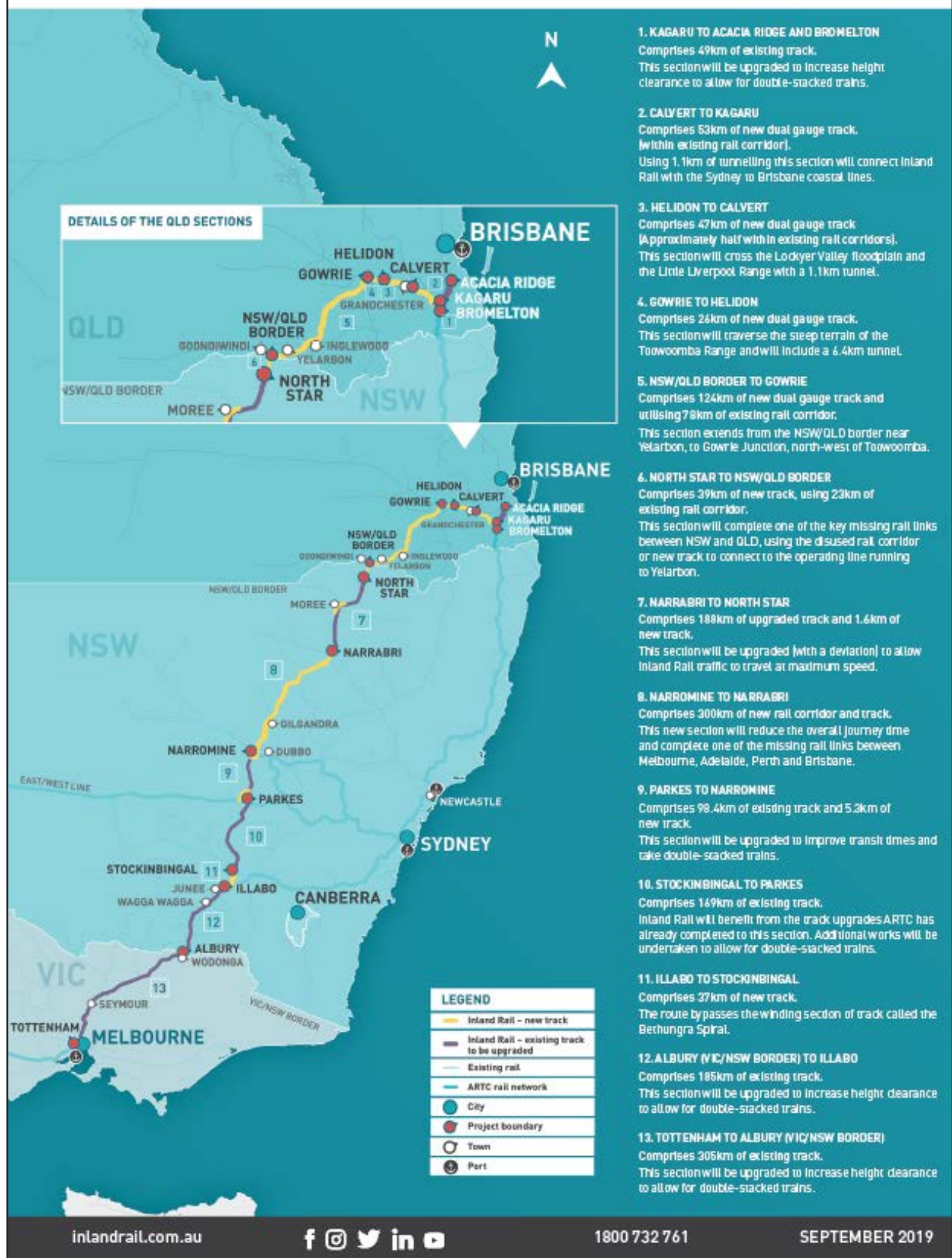


Figure 2 | Inland Rail overview (Source: ARTC website)



2. Project

The Narrabri to North Star Phase 1 project comprises the upgrade of approximately 173 kilometres of the existing rail line and associated facilities between Narrabri and Moree, and Camurra and North Star.

Key features include:

- the upgrade of track, track formation, culverts and underbridges;
- realignment of track within the existing rail corridor;
- five new crossing loops;
- a replacement rail bridge at Croppa Creek;
- a replacement road bridge over the existing rail corridor at the Newell Highway near Bellata; and
- a new road bridge over the existing rail corridor in Moree.

2.1 Physical Layout and Design

The project is located generally within the existing rail corridor between Narrabri and Moree in north-western NSW. The southern part of the project begins north of Narrabri near the intersection of Killarney Gap Road and the Newell Highway and ends at Alice Street, Moree. The northern part begins west of the existing Camurra hairpin and ends approximately 2.5km north of the town of North Star. The proposed alignment is shown in **Figure 2** above. The key components and operational features of the project are described in **Table 1**.

Table 1 | Main components of the project

Aspect	Description
Track upgrading	<ul style="list-style-type: none">• 173km of existing track within the existing rail corridor would be upgraded using a combination of track reconstruction and reconditioning techniques.
Track realignment	<ul style="list-style-type: none">• Reconfiguration of existing crossing loop at Bellata Station.• Works at Gurley and Moree Stations to allow Inland Rail trains to pass the station platform.
Moree Station works	<ul style="list-style-type: none">• Straightening the eastern side of the platform to accommodate the Xplorer passenger service.• Upgrading the existing pedestrian level crossing at the northern end of the station to include gates with lights and bells.
Culvert upgrading	<ul style="list-style-type: none">• Replacement or upgrade of approximately 171 culverts and the retention or extension of 6 existing culverts.
Passing loops	<ul style="list-style-type: none">• Five 2.2 km passing loops at Bobiwa, Waterloo Creek, Tycannah Creek, Coolleearllee and Murgoo.
Rail bridges	<ul style="list-style-type: none">• Construction of a new bridge to replace the existing bridge over Croppa Creek.
Newell Highway overbridge	<ul style="list-style-type: none">• Realignment of existing overbridge, including approximately 1.5 km of new roadway.

Aspect	Description
Jones Avenue overbridge Moree	<ul style="list-style-type: none"> Construction of a road and pedestrian overbridge with road and pedestrian connections between Jones Avenue to the west of the rail corridor (between Warialda Street and Joyce Avenue), and Tycannah Street to the east of the road corridor.
Track drainage	<ul style="list-style-type: none"> Cess drains within the rail corridor adjacent to the track.
Spoil mounds	<ul style="list-style-type: none"> Excess spoil will first be used to reconstruct the track formation. Any remaining excess spoil will be used to form spoil mounds adjacent to the track.
Level crossings	<ul style="list-style-type: none"> Existing level crossings (72 in total) would be retained, refurbished, or decommissioned. 49 to be retained, 14 to be refurbished, 9 to be consolidated or decommissioned. Upgrade of signaling and communications.
Ancillary works	<ul style="list-style-type: none"> Signalling and communications, signage, fencing, noise attenuation structures as well as services and utilities works.

2.2 Construction Works

The Proponent would upgrade the existing rail line between Narrabri and North Star via track reconstruction.

Most of the proposed works would be undertaken within or adjacent to the existing rail corridor. These works include track upgrading, realignment works, culverts/underbridges, passing loops and associated turnouts, drainage, level crossings and railway bridges. The realigned Newell Highway overbridge and Jones Avenue overbridge involve bridge works, embankment and pavement works, and finishing works. These works would be undertaken outside the existing railway corridor.

Approximately 30 construction compounds would be required to construct the project. Minor construction compounds would be located within the rail corridor and used for the assembly of adjacent infrastructure such as culverts and turnouts. Larger compounds would be used for stockpiles, laydown areas, refuelling areas, portable offices, and hazardous materials storage, and located outside the rail corridor approximately every five kilometres. Potential locations of construction compounds are indicated in the Proponent's SPIR. The Proponent will finalise locations following detailed design and the Department has recommended conditions to regulate the location and operation of these facilities.

2.3 Timing

Construction of the project is expected to take 44 months. It is anticipated that works would commence in stages as follows:

- Stage 1 – Narrabri to Penneys Road;
- Stage 2 – Camurra to North Star; and
- Stage 3 – Penneys Road to Moree South.

The indicative construction program is shown in **Table 2**.

Table 2 | Indicative construction program (Source: ARTC, SPIR)

Work Phase	2020		2021				2022				2023				2024	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Stage 1: Narrabri to Penneys Road																
Stage 2: Camurra North to North Star																
Stage 3: Penneys Road to Moree																

2.4 Related Development

The project connects to three other Inland Rail sections:

- North Star to NSW / Queensland border: Proponent finalising EIS;
- Narromine to Narrabri: Proponent preparing EIS; and
- Narrabri to North Star (Phase 2): Request for SEARs lodged.

In December 2019, The NSW Government has declared Moree one of five proposed Special Activation Precincts (SAPs) in regional NSW. Moree is one of three SAPs along the Inland Rail alignment, and the freight opportunity provided by Inland Rail is a key reason for its selection.

The SAP investigation process involves the Department, in conjunction with local councils, conducting master planning and infrastructure studies for employment land. Once the master plan and supporting planning instruments are endorsed, most employment land uses can be undertaken as exempt or complying development.

The Department has commenced the master planning process for the Moree SAP, in collaboration with Moree Plains Shire Council, and other government and industry stakeholders.

Moree Plains Shire Council proposes the Moree Intermodal Park on industrial zoned land on the eastern side of the rail line on the southern edge of Moree. This involves planning for transport and utilities infrastructure to facilitate freight and agribusiness development in this area.



3. Strategic Context

3.1 Strategic Justification

Inland Rail will provide economic benefits to the nation. Economic modelling in the ARTC 2015 Inland Rail Programme Business Case (ARTC, 2015) (the Business Case) indicates Inland Rail will increase gross domestic product by \$16 billion over the 10-year construction period and 50 years of operation. Inland Rail is also expected to deliver 16,000 additional jobs at the peak of construction, and an average of 700 additional jobs per annum over the entire construction period (ARTC, 2015).

Inland Rail will also cater to the projected economic growth in the Eastern states and the emerging constraints on the existing rail network between Brisbane and Melbourne. Australia's east coast population is forecast to increase by 60 per cent over the next 40 years, accompanied by substantial growth in freight demand, which is projected to increase by 70 per cent by 2030. The Melbourne to Brisbane freight task is currently dominated by road freight which accommodates approximately 100,000 truck trips per year. The completed Inland Rail Program will remove approximately 160 trucks for every train between Melbourne and Brisbane, minimising network congestion and improving safety for road users (ARTC, 2015).

Inland Rail will provide a rail line between Melbourne and Brisbane which is 100 kilometres shorter than the existing route via Sydney and reduce Melbourne to Brisbane transit time to less than 24 hours compared to the existing 27.5 hours via Sydney (ARTC, 2015). Bypassing Sydney would not only reduce travel times, but also free up coastal rail paths through Sydney for both passenger and freight rail services.

The Department is satisfied that construction of Inland Rail will result in economic benefits being realised in rural and regional areas of NSW. Inland Rail will be a catalyst for economic development opportunities in regional NSW. The NSW Government has concurrently announced three SAPs along the Inland Rail alignment at Wagga Wagga, Parkes, and Moree. These SAPs involve State Government-led infrastructure and land use planning to fast-track industrial and commercial development in these regional centres. Inland Rail provides a key transport connection that underpins these SAPs.

3.2 Consistency of proposal with strategic planning

The Department considers that the project is strategically justified and consistent with the State Government's commitment to creating jobs, economic growth and providing increased regional freight capacity and infrastructure. This has been identified through strategies and initiatives including:

- Infrastructure NSW *State Infrastructure Strategy 2018-2038* – reiterating the importance of Inland Rail in improving intercity and intracity general and freight transport connections and providing improved travel times and increased network capacity;

- Transport for NSW *Future Transport Strategy 2056* – Inland Rail is recognised as part of the solution to improving freight movements;
- Transport for NSW *Regional NSW Services and Infrastructure Plan* – Inland Rail is listed as a key initiative which provides a once-in-a-generation opportunity to reconfigure the regional freight network in NSW;
- Transport for NSW *NSW Freight and Ports Plan 2018-2023* – Aligning with the *Future Transport Strategy 2056* the goal of this plan is “moving goods in an efficient, safe and environmentally sustainable manner, providing successful outcomes for communities and industry”. Inland Rail is consistent with the plan’s priority action areas to strengthen freight industry and government partnerships, increase access for freight across the rail network, as well as ensure safe, efficient and sustainable freight access to places;
- Department of Planning, Industry and Environment *New England North West Regional Plan 2036* – the plan recognises that Inland Rail is central to transport and economic development opportunity in the region; and
- Department of Premier and Cabinet *Economic Development Strategy for Regional NSW* – Inland Rail is compatible with the goals of the strategy including driving regional employment and regional business growth, as well as investing in economic infrastructure and connectivity.

3.3 Project Benefits

The Narrabri to North Star Phase 1 project would contribute to improved freight transport outcomes by increasing the capacity of the freight network. This will encourage growth and investment in the surrounding area along the route from Narrabri to North Star and expand on regional economic development opportunities in logistics and agriculture. Beneficial impacts during construction include employment (an estimated average workforce of 500 people would be required to construct the proposal), training opportunities, and flow on local and regional economic benefits.

The proposal also has direct benefits for existing rail operations. While the project is mostly single track, the construction of five passing loops will provide efficiencies in freight movements by providing additional lengths of track for trains to pass and reduce waiting times along other sections of the rail corridor. Upgrading and realignment of the track will allow for increased train speeds, reducing travel times between destinations.

Upgrading of the track will involve raising the height of the formation, resulting in flood-proofing against most flood events. This will reduce the frequency of track closures and will reinforce the track against washouts and track failure, which has closed the track for extended periods in the past.

3.4 Project development and alternatives

The Environmental Impact Statement (EIS) (Appendix B – Environmental Impact Statement) considers the merits of the project in the context of several alternative project options, including:

- ‘Do nothing’;
- Alternative freight transport solutions – maritime freight, air freight, road freight; and
- Alternative rail solutions.

The assessment addressed alternative designs and 136 potential route options including two main options between Melbourne and Parkes (via Albury or Shepparton), four main options between Parkes and Moree (via Werris Creek and Binnaway, Binnaway and Narrabri, Gwabegar and Narrabri, or Coonamble and Burren Junction), and two main options between Moree and Brisbane (via Warwick or Toowoomba).

Do nothing

This approach would result in continued growth in use of the road network for freight transport between Melbourne and Brisbane. Substantial investment would be required to ensure the road network is fit for purpose to accommodate forecast increased freight volumes.

The Department is satisfied that this is not a desirable alternative and is not consistent with the State Government's commitments regarding creating regional jobs and economic growth in NSW, and the provision of increased freight capacity and infrastructure. This option is also inconsistent with the strategies and initiatives outlined in **Section 3.2**.

Alternative freight transport solutions

Improvements to cater for increasing freight movements could be achieved through the provision and/or upgrading of alternative freight transport solutions such as maritime, rail, air freight and/or road freight. The Proponent's strategic options assessment compared progressive road upgrades, upgrading the existing east coast railway, and constructing an inland railway, against Infrastructure Australia's Reform and Investment Framework Guidelines. Constructing an inland railway ranked highest with an average high likelihood of improving outcomes across all criteria, compared to progressive road upgrades, and upgrading the existing east coast railway, which both had an average medium ranking.

The *Inland Rail Implementation Group Report* compared maritime freight, air freight, road freight, and upgrading the existing east coast railway, to constructing Inland Rail. It found maritime shipping and air freight were not viable alternatives to Inland Rail. Road transport would require substantial additional investment and even then would be unlikely to meet the longer-term needs for Australia's freight task alone.

Alternative rail solutions

The *Inland Rail Implementation Group Report* assessed the feasibility of upgrading the existing east coast railway and constructing a new inland railway. It was determined that progressive upgrades of the north-south rail corridor (coastal railway) have delivered significant improvements in capacity, performance and reliability. However, structural limitations of the existing rail alignment, shared track with passenger rail in some locations and the inability to accommodate double stacking constrain rail's capacity to support the future freight task on the east coast, particularly between Sydney and Brisbane.

The Department acknowledges the constraints associated with moving freight trains through the Sydney metropolitan rail network and accepts that its use would not be competitive with road transport in terms of cost or time, even with significant further investment.

Alternative corridors

The *North-South Rail Corridor Study* (Department of Transport and Regional Services, 2006) and *Melbourne-Brisbane Inland Rail Alignment Study* (ARTC, 2010) identified a number of potential routes for Inland Rail which were compared based on operating efficiency, infrastructure requirements, market demand, environmental constraints, land issues, railway operation considerations, and financial and economic viability.

The Department is satisfied that the proposed alignment provides a considered balance between environmental costs and benefits, engineering constraints, railway operational requirements and economic viability. The Narrabri to North Star Phase 1 project largely involves the upgrade of existing track, minimising potential environmental impacts that would otherwise be associated with a greenfield site. Additionally, Inland Rail will increase capacity for freight and passenger services by reducing congestion along the busy coastal route, and allow for growth in passenger services, particularly in the Sydney region.



4. Statutory Context

4.1 State Significant Infrastructure

The project is Critical State Significant Infrastructure (CSSI) under section 5.13 *Environmental Planning and Assessment Act 1979* (EP&A Act). The Minister for Planning and Public Spaces is the approval authority for the project.

4.2 Permissibility

The proposal is for the purpose of inland rail infrastructure and is characterised as development permitted without consent in accordance with section 79 *State Environmental Planning Policy (Infrastructure) 2007* (the Infrastructure SEPP).

In accordance with section 5.22(2) EP&A Act, the environmental planning instruments that apply to the proposal are the Infrastructure SEPP (where it relates to the declaration of development that does not require consent) and *State Environmental Planning Policy (State and Regional Development) 2011* (which declared the infrastructure as SSI). No other environmental planning instruments apply.

4.3 Other Approvals

On 26 September 2016, the Commonwealth Department of the Environment and Energy (now Department of Agriculture, Water and the Environment) determined the proposal to be a 'controlled action' under sections 18 and 18A *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), as it was considered likely that the proposal could have a significant impact on listed threatened species and communities.

Following notification from the Commonwealth of the decision that the proposal was a controlled action, the Department confirmed the proposal would be assessed under Schedule 1 NSW Assessment Bilateral Agreement (February 2015). Under this agreement, the Commonwealth has accredited the NSW assessment process under the EP&A Act for the purposes of the EPBC Act, thus enabling a single assessment of the proposal. An approval under the EPBC Act is still required from the Commonwealth decision-maker.

Accordingly, NSW has assessed potential impacts on the relevant Matters of National Environmental Significance (MNES) in accordance with the bilateral agreement. The relevant controlling provision of the EPBC Act is threatened species and communities. The assessment of MNES is provided in **Section 6.1** and includes sufficient detail such that the Commonwealth decision-maker may consider those impacts when determining whether to approve the proposal.

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

4.4 Objects of the *Environmental Planning and Assessment Act 1979*

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:

- Economically sustainable development (see **Sections 3 and 6**);
- Social and economic welfare (see **Section 6**);
- Protection of the environment, including in relation to biodiversity, traffic, noise and vibration, air quality, utility management, water hydrology, urban design, amenity and socioeconomic issues (see **Section 6**);
- Sustainable management of built and cultural heritage, including Aboriginal cultural heritage (see **Section 6**);
- Good design and amenity of the built environment (see **Section 6**);
- Principles of ecologically sustainable development (see **Section 4.5**);
- Promote the sharing of the responsibility for environmental planning and assessment between the different levels of government (see **Section 5**); and
- Community participation in the assessment of the proposal (see **Section 5**).

4.5 Ecologically sustainable development (ESD)

The EP&A Act adopts the definition of ESD found 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 consideration in decision-making process and that ESD be achieved through the implementation of:

- a) the precautionary principle;
- b) inter-generational equity;
- c) conservation of biological diversity and ecological integrity; and
- d) improved valuation, pricing and incentive mechanisms.

The Proponent addressed the above principles in Chapter 22 of the EIS. The EIS includes detailed discussion on the sustainability of the project, as well as detailed studies and/or consideration in the areas of noise and vibration, air quality, heritage, biodiversity, socio-economics, flooding and hydrology, climate change and cumulative impacts. The Proponent has then identified a broad range of mitigation measures to manage impacts associated with these issues. Further, project objectives which guide the delivery and operation of the proposal contribute to the sustainability of the project and the meeting of ESD principles.

The Department has recommended conditions of approval requiring the:

- preparation of a Sustainability Strategy that will be implemented throughout the design, construction and operation of the project. The Strategy will identify opportunities to reduce operational greenhouse gas emissions and other sustainability initiatives;
- project achieve a minimum “Excellent” ‘Design’ and ‘As built’ rating under the Infrastructure Sustainability Council of Australia infrastructure rating tool; and
- Proponent to offset the biodiversity impacts of the project.

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 also 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.

In conclusion, the Department considers that the proposal is consistent with the principles of ESD.



5. Engagement

5.1 Department's Engagement

Under section 5.28(1)(c) of the EP&A Act, the Planning Secretary is required to make the EIS publicly available. The EIS (see Appendix B – Environmental Impact Statement) was made publicly available from Wednesday 15 November 2017 until Friday 15 December 2017 (31 days) on the Departments website. The EIS was made publicly available at the following locations:

- Department of Planning and Environment – 320 Pitt Street, Sydney;
- Nature Conservation Council of NSW – Level 14, 338 Pitt Street, Sydney;
- Moree Plains Shire Council – Level 2, 30 Heber Street, Moree;
- Moree Community Library – 36 Balo Street, Moree;
- Dhiyaan Aboriginal Centre – 38 Albert Street, Moree;
- Narrabri Shire Council – 46-48 Maitland Street, Narrabri;
- Narrabri Library – 8 Doyle Street, Narrabri;
- Wee Waa Library – 106 Rose Street, Wee Waa;
- Gwydir Shire Council – 33 Maitland Street, Bingara;
- Gwydir Shire Council – 58 Hope Street, Warialda;
- North Star Post Office – 17 Edward Street, North Star;
- Croppa Creek Store – 6 Buckie Road, Croppa Creek; and
- Service NSW Centres.

The Department advertised the public exhibition in the Sydney Morning Herald, The Daily Telegraph, Narrabri North West Courier, Moree Champion, Moree Border News, The Australian, and The Land. The Department also notified State and local government authorities of the exhibition.

Departmental representatives met with Narrabri, Moree Plains and Gwydir Shire Councils, as well as Moree Local Aboriginal Land Council and local landowners prior to EIS exhibition, to discuss the project and gain an understanding of local and regional constraints and issues, community concerns and how the project might interact with local projects and initiatives. Ongoing engagement with government and non-government stakeholders has occurred during the assessment of the project.

The Department undertook site inspections in September 2017 and January 2019 along the proposed freight route to enhance understanding of the local social, economic, and environmental issues, which informed assessment of the project.

5.2 Summary of submissions

Exhibition of the EIS received 18 submissions on the proposal. Two were received from local councils, six from government agencies and ten from the community, including seven from individuals and three

from community and business groups (Appendix C – Submissions). A summary of the submissions is provided in **Table 3**.

Table 3 | Summary of submissions

Submitters	Number	Position
Government Agencies	6	
Department of Industry (now Water Group of the Department of Planning, Industry and Environment, and Department of Regional NSW)		Comment
Transport for NSW		Comment
Environment Protection Authority		Comment
Office of Environment and Heritage		Comment
Heritage Council of NSW		Comment
Geological Survey of NSW		Comment
Council(s)	2	
Moree Plains Shire Council		Support
Narrabri Shire Council		Comment
Community	7	
Croppa Creek	2	Comment
	1	Object
Moree	1	Support
	1	Comment
Crooble	1	Support
Outside project area	1	Object
Community and business groups	3	
Croppa Creek Bowling Club		Support
Graigue Farming Partnership		Support
Boolah Partnership		Comment
TOTAL	18	

5.3 Key Issues – Government Agencies

Department of Industry (now Water Group of the Department of Planning, Industry and Environment and Department of Regional NSW) requested the Proponent confirm water supply requirements, assess impacts of any water extraction, and demonstrate consistency with the *Floodplain Management Plan for the Gwydir Valley Floodplain 2016*. It also provided suggestions for biosecurity and vegetation rehabilitation management.

Transport for NSW (TfNSW) made the following comments:

- noted the need for level crossing safety and treatment options to be assessed;
- noted the need for a 60 metre separation between level crossings and the Newell Highway to prevent short-stacking;
- queried the relevance of traffic data to inform the assessment;
- requested further analysis of potential level crossing delays in Moree; and
- noted technical and contractual requirements for the project's two road over rail bridges.

Environment Protection Authority (EPA) raised concerns about construction outside standard hours, adequacy of the noise and vibration assessments, management and use of wastewater, as well as the disposal of waste.

Office of Environment and Heritage (OEH) (now Environment, Energy and Science Group of DPIE) identified information gaps in the Proponent's assessment of flooding and hydrology and recommended further investigation and liaising with Moree Plains Shire Council. OEH raised concerns regarding impacts to biodiversity values and the use of vegetation mapping, and that preference be placed on community monitoring rather than excavation and artefact analysis of Aboriginal cultural heritage sites.

Heritage Council of NSW expressed concerns over the demolition of the Mehi River, Gwydir River and Croppa Creek rail bridges and suggested they instead be retained and strengthened.

The Heritage Council also advised that an archaeological management sub-plan as part of the CEMP is considered appropriate to define the measures to be implemented during construction at the former Aboriginal fringe camp site near the Mehi River bridge.

The Department notes that the Mehi and Gwydir River bridges and the Aboriginal fringe camp site are no longer within the project as revised by the SPIR.

Geological Survey of NSW (GSNSW) noted that there are three petroleum licences within the study area and that the proponent should continue to consult with these licence holders.

5.4 Key Issues – Councils

Narrabri Shire Council expressed concerns about the project's impact on traffic, transport and access. Council highlighted the need for the efficiency of the Newell Highway to be maintained and to ensure safety and minimise queuing times at level crossings (especially when queuing). Council also noted the proposal's flooding, noise and vibration, and social and economic impacts and requested that these are appropriately managed by the implementation of mitigation measures.

Moree Plains Shire Council noted its strong support for the project but raised concerns about aspects of the project. Council noted that its preference is for Inland Rail to bypass Moree to the east but accepts the through-town route subject to detailed assessment and mitigation measures for:

- severance;
- corridor safety;
- emergency vehicle movement; and
- construction impacts and acoustic treatment

Council also noted the need for an appropriate east-west large vehicle crossing and suggested an additional grade separated crossing to the south of Moree that could link to planned intermodal facilities.

Council also raised concern with flooding impacts, particularly within the Moree township; Council's position is that the project should not worsen existing flooding and should take opportunities to improve existing flooding conditions. Council commissioned an independent review of the EIS flooding assessment, which noted that additional information assessment was required in respect to the Gwydir floodplain.

Council's submission also:

- suggested that biosecurity measures should consider local and regional weeds;
- requested dilapidation surveys for local roads;
- highlighted the need to consult landowners over local road and level crossing impacts;
- requested regional dust monitoring; and
- highlighted opportunities for local and Aboriginal employment in the project.

5.5 Key Issues – Community and Special Interest Groups

Several issues were raised by the community and special interest groups and have been listed below. Further detail and consideration of the issues raised are provided for each of the key assessment issues in **Section 6** and Appendix I – Community Views for Draft Notice of Decision.

- Restriction of private property access and the ability to maintain practical and realistic access;
- Impacts on agricultural business operations such as farms and grain silos, and their need to maintain private level crossings;
- Noise, vibration and air quality impacts from larger and more frequent trains, and consequential impacts on residential amenity and property values;
- Noise and severance impacts on the Croppa Creek Bowling Club;
- Traffic, noise and business impacts of the proposed Jones Avenue overbridge;
- Concerns with the ARTC business case for Inland Rail and the social, economic and environmental impacts compared with alternate options; and
- Support for the project for sustainability, economic, and social reasons.

5.6 Response to submissions and preferred infrastructure report

Following the exhibition of the EIS, the Department directed the Proponent to respond to submissions, and undertake further flooding assessments to provide a more complete understanding of the upstream and downstream impacts of the proposal. In undertaking this task, the Proponent provided a combined Response to Submissions and Preferred Infrastructure Report (SPIR) that amended the project to exclude the section within the Mehi – Gwydir River floodplain and allow further consideration of the project's design in this area.

The proposed changes and justification are listed below:

- Omission of the section of the corridor between Moree and Camurra North, to allow additional consideration of the potential impacts on hydrology and suitable design responses and mitigation (**Figures 3 and 4**). This section will be subject to a separate development application and approvals process (Phase 2);
- Widening of the project's construction footprint, which expands the area from 1,383 ha to 2,436 ha, to provide a less constrained construction area. The Proponent advised that it is unlikely to use this entire area during construction;
- Changes to the alignment of the track within the existing rail corridor, to further minimise the potential for hydrological, traffic, operational noise, ecological and construction impacts;
- Changes to locations of level crossings, crossing loops and associated rail sidings, to improve road/rail safety and address the integration with other infrastructure;
- Changes in design of the Jones Avenue overbridge, as a result of community and stakeholder consultation post-exhibition;
- Refinement of operational noise and vibration impacts assessments and clarification of locations where noise mitigation measures are anticipated; and
- Refinement of the construction methodology and program, to limit conflicts with grain freight requirements through the summer period.

Exhibition of SPIR

The SPIR (**Appendix D** – Submissions and Preferred Infrastructure Report) was made publicly available from Wednesday 11 December 2019 until Friday 31 January 2020 (51 days) on the Department's website. It was advertised in the same publications as the EIS and exhibited in the same locations (except for the North Star Post Office, which has closed). The Department also notified State and local government authorities of the exhibition.

Summary of Submissions/Key Issues

A total of nine submissions were received including seven from government agencies and two from councils. No public submissions were received.

Environment, Energy and Science Group (EES) DPIE provided comments relating to biodiversity, Aboriginal cultural heritage and flooding and hydrology. Biodiversity comments note that the Proponent should complete a rapid field assessment to confirm the desktop assessment of the

expanded construction footprint, elaborate on how additional impacts to the koala were determined, and provide updated mapping.



Figure 3 | Phase 1 and 2 Boundary Map – South (Source: ARTC)



Aboriginal cultural heritage comments note that the Registered Aboriginal Parties (RAPs) should be engaged when designing additional surveys for the modified footprint and should be consulted during the development of the Heritage Management Plan.

Hydrology comments noted that additional flooding modelling had been undertaken since the EIS and recommended that the Proponent provide EES with spatial data of potentially eroded land, that the project consider implementing erosion threshold guidelines in the *Floodplain Management Plan for the Gwydir Valley Floodplain 2016*, and the Proponent should consult with landowners where land is impacted by increased afflux and flood duration.

Transport for NSW (TfNSW) requested further information and raised concerns about the Jones Avenue overbridge from a safety and heavy vehicle connectivity perspective and suggested its relocation to the south of Moree near the Special Activation Precinct and Council's proposed intermodal park. TfNSW raised the design and location of level crossings, including potential short stacking and level crossing treatment methodologies. The submission also discussed the need to ensure storm and floodwater measures are consistent with those for the Newell Highway upgrade, and for any modifications to Moree Railway Station to be endorsed by TfNSW.

DPIE Water requested further information about construction water sources and confirmation that these are adequate to supply the project, further assessment of the proposal's hydrology impacts, and an assessment of the project's consistency with relevant floodplain management requirements. DPIE Water also recommended conditions regarding scour protection thresholds and should develop environmental management plans in consultation with DPIE Water and NRAR.

Environment Protection Authority (EPA) noted the need to ensure construction and operational noise impacts are minimised and recommended conditions of approval to that effect.

Heritage Council of NSW noted the proposed demolition of the Gwydir River and Mehi River bridges are no longer part of this project and the Proponent's revised mitigation measures are appropriate.

Water NSW and **Regions, Industry, Agriculture and Resources Group of DPIE** advised they had no comments.

Gwydir Shire Council raised concerns about potential flooding in Croppa Creek (at Croppa Creek Public School and Buckie Road) and requested that any impacts are mitigated.

Moree Plains Shire Council advised that while it strongly supports the project as a whole, it no longer supports the Jones Avenue overbridge, citing safety, connectivity and heavy vehicle movement concerns. Council requested that this bridge is relocated south of Moree to serve the proposed intermodal and Special Activation Precinct and recommended a condition to this effect.

Council's submission also discussed noise impacts and requested further consultation with Council and affected communities about the type, design and location of noise control structures, and consulting affected residents about the duration and times of day for construction hours. The revised flooding assessment raised concern with proposed afflux levels on roads, noting safety impacts of driving through floodwaters. Regarding the proposed flood velocity levels, Council suggested the

Proponent consult with landowners on appropriate measures to mitigate and manage erosion on agricultural lands.

Council also provided recommendations on the management of rail corridor crossings in the vicinity of Moree, flooding, Aboriginal cultural heritage, worker accommodation, weed management and bushfire emergency measures.

5.7 Response to Submissions

Following the SPIR exhibition, the Department directed the Proponent to prepare a response to the submissions received as part of the exhibition of the SPIR. The Proponent submitted a Response to Submissions Report (Appendix E – Response to Submissions) which was made publicly available on the Department's website on 29 May 2020.

The RtS included further information and assessment of:

- biodiversity;
- heritage
- hydrology;
- water supply; and
- traffic and transport.

The Department has considered the matters raised in these submissions and the Response to Submissions and has addressed any residual matters in Chapter 6 of this report and in recommended conditions of approval.



6. Assessment

The Department's assessment, including consideration of submissions received, has identified the key issues as being biodiversity, hydrology, noise and vibration, traffic, the proposed Moree bridge, heritage, and social impacts (**Sections 6.1 to 6.7**). Other issues are discussed in **Section 6.8**.

6.1 Biodiversity¹

The proposal will result in impacts to the biodiversity in the project area. The Proponent has identified direct impacts to threatened ecological communities and threatened flora and fauna species within and adjoining the existing rail corridor. These impacts will be reduced where possible through the detailed design of the project. The residual biodiversity impacts will be offset by the purchase of ecological and species credits through biodiversity stewardship agreements. The Department has recommended conditions of approval which specify the total area of plant community types that can be directly impacted, the ecological and species credits required for the project and requirements for a Construction Biodiversity Management Sub-plan to manage construction impacts on biodiversity and implement protocols to comply with the requirements of the *Biosecurity Act 2015* and *Biosecurity Regulation 2017*.

6.1.1 Issue

The proposal is in the Brigalow Belt South Interim Biogeographic Regionalisation for Australia (IBRA) bioregion. The relevant IBRA subregions are the Northern Basalts and Northern Outwash. The IBRA bioregion and subregions are shown in **Figure 5**.

Much of the development site has been heavily modified by past and ongoing disturbances associated with the rail corridor and surrounding agricultural activities. A considerable amount of the proposal area is cleared or consists of non-native vegetation. Patches of native vegetation occur within and near the proposal area, which are typically associated with riparian corridors, Travelling Stock Reserves (TSRs), road reserves or farm woodland remnants. Extensive areas of natural grasslands are also located within the proposal area.

Following exhibition of the EIS, the Proponent has undertaken further investigations and design refinements and identified a revised development footprint to provide more flexibility in construction work. Additional assessments have been undertaken of the biodiversity values of the revised development footprint and is contained in the *July 2020 Addendum to the Inland Rail Narrabri to North Star Biodiversity Assessment Report, Final July 2020* (referred to in this report as the BAR Addendum) in the SPIR.

¹ References to sections of the EIS, the Submissions Preferred Infrastructure Report and the recommended conditions of approval have been included in this section to satisfy the Commonwealth's assessment requirements.

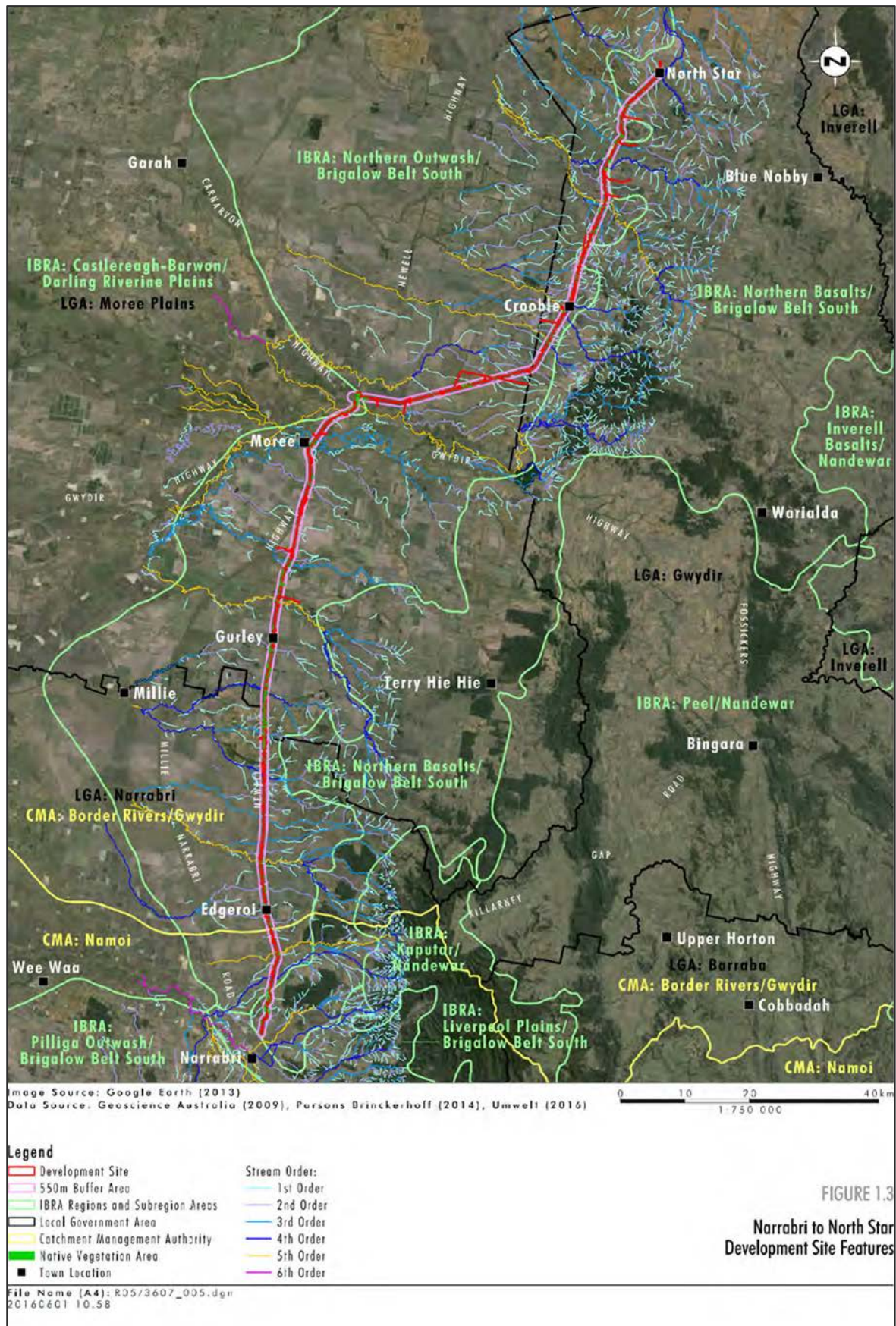


Figure 5 | IBRA Bioregions and Subregions in the proposal area (Source: EIS)

On 25 August 2017, the *Biodiversity Conservation Act 2016* (the BC Act) repealed the *Threatened Species Conservation Act 1995* (TSC Act). The proposal is a pending planning application under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*. Clause 28 states that the former planning provisions under the TSC Act continue to apply to the proposal (and Part 7 BC Act does not apply) to the determination of a pending planning application. As all threatened species, communities and their habitats are now listed under the BC Act, the biodiversity assessment and report for the proposal refers to these listings, however, the assessment has been undertaken as per the requirements of the SEARs, which references the TSC Act.

The proposal is a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Bilateral agreement and framework for biodiversity assessment

The then Bilateral Agreement between the Commonwealth and NSW Government for the assessment of environmental approvals under the EPBC Act endorsed the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014) and *Framework for Biodiversity Assessment* (FBA) (OEH, 2014) to undertake biodiversity assessments. The Proponent has updated the Biodiversity Assessment Report (BAR) to include an assessment of the biodiversity impacts to the additional disturbance footprint. The BAR Addendum includes an assessment of the impacts to MNES.

The Proponent addressed Commonwealth requirements and assessed the impacts of the revised development footprint on MNES in the BAR Addendum. Relevant EIS sections to MNES include:

- Chapter 6 – Alternatives and proposal options;
- Chapter 26 – Cumulative and residual impacts;
- Chapter 27 – Approach to environmental management and mitigation;
- Appendix L – Inland Rail - Narrabri to North Star; Biodiversity Offset Strategy (Phase 1);
- Technical Report 2 – Biodiversity Assessment Report;
- Technical Report 3 – Aquatic Ecology Assessment; and
- Technical Report 4 – Commonwealth Matters Assessment.

The sections of the SPIR relevant to MNES include:

- Chapter 12.1 – Biodiversity impacts;
- Chapter 13.1 – Revised mitigation measures and conclusion;
- Appendix F – July 2020 Addendum to the Narrabri to North Star Biodiversity Assessment Report; and
- Appendix G – Biodiversity Briefing Note.

Commonwealth listed species to be impacted

The Commonwealth Department of Agriculture, Water and the Environment (DAWE) concluded in its assessment of the referral documentation that 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).

DAWE considered the proposed action is also likely to have a significant impact on:

- Natural Grassland on Basalt and Fine-textured Alluvial Plains of Northern New South Wales and Southern Queensland - Critically Endangered; and
- Koala (*Phascolarctos cinereus*) (combined populations of Queensland, NSW and ACT) – vulnerable.

DAWE considered there is some risk to several threatened species and communities, and they must be assessed for impacts. These species and communities are listed in Appendix F – EESG Biodiversity Assessment.

Clearing of native vegetation will impact threatened ecological communities

The proposal will clear approximately 890.41 ha of native vegetation, including 863.37 ha of listed threatened ecological communities (TEC) under the BC Act and/or the EPBC Act. **Table 4** provides a summary of the impacts to native vegetation and whether they are a listed TEC.

Table 4 | Native vegetation impacted by the proposal (Source: Addendum, May 2020)

Zone and Plant community type (PCT)	TEC under the BC Act	TEC under the EPBC Act	Condition class	Area impacted (ha)	Percent of PCT zone and area impacted (ha) with no access
Zone 1 - PCT27 (BR233, NA219) Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion	<i>Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions</i> - 17.94 ha	<i>Weeping Myall Woodlands</i> – 9.16 ha ²	Moderate to good	17.94	13% 2.35
Zone 2 - PCT35 (BR120, NA117) Brigalow – Belah open forest / woodland on alluvial often gilgaied clay from Pilliga Scrub to Goondiwindi, Brigalow Belt South Bioregion	<i>Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions</i> – 17.21 ha (0.1 ha patch not considered to conform to the EEC given the heavily disturbed condition)	<i>Brigalow (Acacia harpophylla dominant and codominant)</i> – 16.13 ha ²	Moderate to good	17.31	32% 5.47
Zone 3 - PCT39 (BR130, NA129) Coolabah – River Coobah - Lignum woodland wetland of frequently flooded	<i>Coolibah – Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain and Mulga</i>	<i>Coolibah - Black Box Woodland of the Darling Riverine Plains and the Brigalow</i>	Moderate to good	1.74	11% 0.20

² All remaining patches in the zone do not meet the 0.5 ha minimum patch size in the EPBC listing criteria.

Zone and Plant community type (PCT)	TEC under the BC Act	TEC under the EPBC Act	Condition class	Area impacted (ha)	Percent of PCT zone and area impacted (ha) with no access
floodplains mainly in the Darling Riverine Plains Bioregion	<i>Lands Bioregions</i> - 1.74 ha	<i>Belt South Bioregions</i> – 1.74 ha			
Zone 4 - PCT52 (BR191, NA187) Queensland Bluegrass +/- Mitchell Grass grassland on cracking clay floodplains and alluvial plains mainly the northern-eastern Darling Riverine Plains Bioregion	Not listed	<i>Natural Grasslands on Basalt and Fine-textured Alluvial Plains of Northern NSW and Southern Qld</i> – 432.07 ha	Moderate to Good Natural Grassland	432.07	7% 32.04
Zone 5 - PCT56 (BR186, NA182) Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	Not listed	Likely to conform to <i>Poplar Box Grassy Woodland on Alluvial Plains</i> ³	Moderate to good	143.95	17% 24.03
Zone 6 - PCT56 (BR186, NA182) Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW (Derived Native Grasslands (DNG))	Not listed	Portions of this vegetation (between woodland patches) are likely to conform to <i>Poplar Box Grassy Woodland on Alluvial Plains</i> ³	Moderate to good Derived Native Grasslands (DNG)	249.85	14% 35.16
Zone 7 - PCT71 (BR127, NA126) Carbeen – White Cypress Pine - River Red Gum - bloodwood tall woodland on sandy loam alluvial and aeolian soils in the northern Brigalow Belt South Bioregion and Darling Riverine Plains Bioregion	<i>Carbeen Open Forest community in the Darling Riverine Plains and Brigalow Belt South Bioregions</i>	Not listed	Moderate to good	0.51	-
Zone 8 - PCT78 (BR196, NA193) River Red Gum riparian tall woodland / open forest wetland in the	Not listed	Not listed	Moderate to good	11.82	7% 0.83

³ *Poplar Box Grassy Woodland on Alluvial Plains* was listed under the EPBC Act as a TEC on 4 July 2019, after the controlled action decision on the proposal, and therefore does not require to be offset under the EPBC Act.

Zone and Plant community type (PCT)	TEC under the BC Act	TEC under the EPBC Act	Condition class	Area impacted (ha)	Percent of PCT zone and area impacted (ha) with no access
Nandewar Bioregion and Brigalow Belt South Bioregion					
Zone 9 - PCT135 (BR284, NA271) Coobah - Western Rosewood low open tall shrubland or woodland mainly on outwash areas in the Brigalow Belt South Bioregion	Not listed	Not listed	Moderate to good	9.50	6% 0.60
Zone 10 - PCT413 (BR346, NA348) Silver-leaved Ironbark - White Cypress Pine - box dry shrub grass woodland of the Pilliga Scrub - Warialda region, Brigalow Belt South Bioregion	Not listed	Not listed	Moderate to good	5.72	38% 2.19
TOTAL				890.41	102.87

In addition, the amended proposal would impact 1,545.68 ha of cleared/non-native vegetation.

The Proponent did not have land access to several properties during the Summer 2020 surveys, however most of the native vegetation and potential threatened species habitat in these areas largely consists of fragmented patches located immediately adjacent to surveyed areas and generally of similar condition type. The Proponent conducted over the fence inspections to confirm PCTs, condition type and broad habitat types. Approximately 11.55% of the proposal (or 102.87 ha of native vegetation) was not surveyed, of which 96.5% or 99.25 ha comprised TECs.

The direct impact on native vegetation would result in the loss of fauna habitat for locally occurring threatened fauna species. This includes the loss of potential breeding and foraging habitat.

The Proponent has committed to offset impacts to TEC in accordance with the NSW Biodiversity Offsets Policy for Major Projects.

Threatened flora species to be impacted

Ten threatened flora species were identified as potentially being at risk from construction, with surveys identifying three threatened flora species impacted:

- Belson's panic (*Homopholis belsonii*) - endangered under the BC Act and vulnerable under the EPBC Act;
- Creeping Tick-trefoil (*Desmodium campylocaulon*) - endangered under the BC Act; and

- Finger Panic Grass (*Digitaria praealta*) - endangered under the BC Act.

The impact on threatened flora species is shown in **Table 5**. For areas where land access was not available, assumed presence by habitat area has been applied for Belson's panic and Finger panic grass.

Table 5 | Impact on threatened grass species (Source: April 2020 Addendum)

Species	BAR (EIS)	Revised Development Footprint (December 2019 desktop analysis)	BAR Addendum Revised Development Footprint (following Summer 2020 surveys)
Finger panic grass	28 individuals	906 ha ⁴	66 individuals (39 in 2020 and 27 in 2015-16 surveys) 99.25 ha in Zones 1 – 6 ⁵
Creeping tick-trefoil	237 ha	597 ha	432.07 ha
Belson's panic	73 individuals	913 ha ⁴	255 individuals (182 in 2020 and 73 in 2015-16 surveys) 99.65 ha in Zones 1, 2, 4, 5, 6, 7, 9 ⁵

No critical habitat listed under the BC Act occurs within the biodiversity assessment area.

Terrestrial fauna impacts expected

A total of 93 fauna species were targeted during field surveys, with seven species recorded in the proposal area. The threatened fauna species are:

- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*);
- Varied sittella (*Daphoenositta chrysoptera*);
- Eastern bentwing-bat (*Miniopterus schreibersii oceanensis*);
- Little pied bat (*Chalinolobus picatus*);
- Yellow-bellied sheath-tail-bat (*Saccolaimus flaviventris*);
- Koala (*Phascolarctos cinereus*); and
- Grey-headed flying-fox (*Pteropus poliocephalus*).

All recorded fauna species are listed as vulnerable under the BC Act, with the koala and Grey-headed Flying-fox also listed as vulnerable under the EPBC Act.

Fourteen koalas were recorded at two fauna survey sites as well as four other opportunistic locations along the proposal area. Koala scats were found at an additional two locations. The proposal area contains three known koala food tree species and 62.77 hectares of known koala habitat. Under the revised development footprint, impacts to koala habitat have increased to 175.25 ha (comprising food tree species and refuge habitat).

One Grey-headed flying fox was recorded in the alignment during the EIS targeted surveys. The proposal impacts 19.13 ha of Grey-headed flying fox habitat, however, no camps or breeding sites are located in the revised development footprint.

⁴ Revised calculations in December 2019, based on the area of habitat in the absence of targeted surveys.

⁵ Assumed presence in areas where no land access was available for Summer 2020 surveys.

Potential foraging habitat in the proposal area exists for a number of other EPBC Act listed threatened species. DAWE's controlled action decision required the biodiversity assessment to assess the impact of the proposal on several threatened fauna species. The BAR Addendum noted that targeted fauna surveys did not record the presence of these threatened species.

Minimal impacts to aquatic flora and fauna

The proposal crosses named and intermittent watercourses and their tributaries, and irrigation canals within three catchment areas of the Murray-Darling Basin. The aquatic biodiversity assessment considered the following *Fisheries Management Act 1994* (FM Act) listed threatened ecological communities and species:

- *Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Darling River* - the Namoi River downstream of the Manilla River; and
- Eel tailed catfish (*Tandanus tandanus*) endangered population - recorded in Tycannah Creek upstream of the rail line and the Namoi River upstream and downstream of Narrabri.

Neither of these entities were recorded in the targeted surveys.

The project will have localised disturbances due to the replacement of existing watercourse crossing structures (bridges, culverts, pipes). As part of these works riparian vegetation would be disturbed. The clearing of riparian vegetation has been assessed in accordance with the FBA.

The aquatic biodiversity assessment concluded the proposal is unlikely to have an adverse impact on the identified threatened ecological community and threatened species. The implementation of appropriately designed fish friendly crossing structures and other mitigation measures should further reduce impacts.

Ramsar listed wetlands will not be impacted

The proposal site is located within the catchment of four Ramsar listed wetlands, however the nearest Ramsar wetlands are the Gwydir wetlands located approximately 45 km west of Moree. The proposal has no impacts on Ramsar wetlands and further assessment is not required.

No impacts to groundwater dependent ecosystems

The biodiversity assessment noted existing watercourse crossings have been previously disturbed and there is minimal riparian vegetation in the rail corridor. Works to bridges and culverts are not expected to significantly change local flow regimes and will not disturb groundwater. The assessment predicted no impacts to groundwater dependent ecosystems and no further assessment is required.

Biosecurity risk – transfer of noxious weeds

The existing rail corridor and surrounding area are subject to noxious weed infestation which is harmful to agricultural and horticultural crops, natural habitats and ecosystems, and livestock. There is the potential for weeds and disease to be transferred from one property to another during construction by the movement of construction vehicles or machinery, or by construction crew clothing and footwear.

6.1.2 Submissions

Government Agency and Council Submissions

OEH (now **EESG**) made the following comments:

- Additional information needs to be provided to determine whether impacts to biodiversity have been appropriately assessed and offset;
- The biodiversity credit liability should be finalised prior to project determination;
- Temporary impacts to biodiversity values must be assessed and offset appropriately;
- Impacts to threatened flora species should be avoided where possible;
- The biodiversity offset for creeping tick-trefoil must be based on the area of habitat;
- Further justification of the area identified as koala habitat;
- Site assessment of Jones Avenue Bridge and the North Star Extension Area is required;
- Handling of micro-bats should be kept to a minimum; and
- More timely delivery of all phases of the Biodiversity Offset Strategy is required.

EESG's response to the SPIR noted that following its endorsement of the BAR Addendum (Final October 2018) changes had been made to the project footprint. These changes are not reflected in the SPIR's Appendix F - BAR Addendum, October 2018 and Appendix I – Biodiversity Offset Strategy. In addition, **EESG** requested:

- Rapid field assessments to validate desktop assessment of PCTs;
- An updated vegetation map at a scale where individual PCTs are identifiable;
- Updated spatial files and details of PCTs included in the flora species credit polygons;
- Amended species credit polygons in a spatial format for all species credit species; and
- Details of how additional impacts to the koala was determined.

Department of Industry (now **Department of Regional NSW**) recommended the Vehicle Biosecurity Security Kit factsheet be included as a resource guide as part of the biodiversity management sub-plan within the Construction Environmental Management Plan.

Moree Plains Shire Council requested further detailed consideration as part of the construction and operation environmental management plans to achieve biosecurity best practice and prevent weed movement. Further consideration of weeds of local and regional significance need to be undertaken. Council recommended the Proponent consult with it in the development of a biosecurity management plan.

In relation to the SPIR, **Moree Plains Shire Council** supported the staged approach to determining biodiversity offset requirements, including further surveys at appropriate times to further refine mapping and species identification.

6.1.3 Department's consideration

The assessment of biodiversity impacts of the project has been carried out in accordance with the *Biodiversity Offset Policy for Major Projects* and the *Framework for Biodiversity Assessment*. The Department acknowledges the project will directly impact ecological communities identified under the

BC Act and EPBC Act. Although the project also removes foraging habitat for the koala and other threatened fauna species, the Department has recommended a condition requiring that impacts on koala habitat is reduced in the final construction footprint. The Department considers that the provision of ecosystem and species credits, including a minimum level of koala credits, will offset the vegetation and koala habitat impacts of the proposal. The impacts to these habitats would be offset in accordance with the *Framework for Biodiversity Assessment*.

The assessment adequately considers Matters of National Environmental Significance

The Department considers that the Proponent has addressed the impacts of the project on Matters of National Environmental Significance. The Proponent identified the proposal would have a significant impact on the *Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland CEEC*. The Proponent states the proposal would involve impacts to *Brigalow (Acacia harpophylla dominant and co-dominant) EEC*, *Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions EEC* and *Weeping Myall Woodlands EEC* and threatened flora species Belson's panic, however these impacts were not considered to be significant.

The Department notes that there are likely to be significant impacts to the Brigalow EEC and Weeping Myall Woodland EEC and Belson's panic. However, impacts to these communities and species cannot be avoided and the Proponent has committed to reduce impacts through detailed design and by offsetting impacts through the purchase of biodiversity credits. The Department considers that these are appropriate measures and are reinforced by the recommended conditions of approval.

The Proponent has identified impacts to the habitat of the EPBC Act listed koala and Grey headed flying fox. Although the Proponent states that the proposal does not significantly impact koalas, the Department does not agree and considers that the clearing of 175.25 ha of habitat to be a significant impact. Impacts to koalas are considered in the following subsections of this report.

The Department agrees with the Proponent's conclusion that the clearing of 19.13 ha of Grey-headed flying fox foraging habitat would not have a significant impact, as no camps or breeding habitat is impacted by the proposal. Impacts to the koala would be offset by the provision of ecosystem and species credits, and for the Grey-headed flying fox by ecosystem credits for habitat cleared by the proposal.

The Department recommends that DAWE considers and adopts these recommendations. Appendix G – Matters of National Environmental Significance of this report sets out the additional EPBC Act considerations, including the Commonwealth's international obligations and the consideration of relevant approved conservation advices, threat abatement plans and recovery plans.

Assessment methodology is considered satisfactory

The Department's key concern arose from the need for the Proponent to undertake further assessment to address the project footprint changes presented in the SPIR. Following advice from the Department and EESG, the Proponent undertook further assessment, including rapid vegetation assessment in February and March 2020 following spring rainfall. However, access to the parts of the proposal located on private property remains a constraint of field surveys and assessment.

Approximately 11.5% of the proposal area was not surveyed. In these areas the threatened grass species, Belson's panic and finger panic grass are assumed to be present, based on the identification of these species in targeted surveys undertaken for the revised development footprint. Habitat for other species-credit species (Koala and creeping tick-trefoil) is assumed to be present, based on suitable habitat in line with the remainder of the revised development footprint.

EESG is satisfied with assessment methodology for the areas not previously surveyed and accessed, and the updates to the BAR. A copy of EESG comments is in **Appendix C**.

Threatened communities and species impacts

The proposal will result in a range of direct impacts on biodiversity values, including loss of native vegetation and fauna habitats from direct and permanent clearance works and track upgrades. Impacts will be caused by clearing the existing rail corridor of its current grassland communities to undertake the upgrade works, clearing vegetation for the Newell Highway bridge realignment, and clearing vegetation for construction sites and access tracks.

As noted, the proposal will impact TECs and the Department sought advice from the Proponent on how these impacts could be avoided. The Proponent advised that where works could be relocated outside of native vegetation (such as the placement of site offices and storage bunds) this would occur. However, in most cases there is little scope for further avoidance of ecological impacts due to the environmental constraints posed by the existing rail line and rail corridor.

The measures to mitigate impacts on native vegetation during construction include:

- undertaking further detailed design to consider native vegetation and significant ecological entities, including threatened ecological communities and threatened species habitat, to avoid and minimise ecological impacts where possible;
- demarcating areas approved for clearing to reduce risk of accidental clearing/disturbance of surrounding native vegetation;
- fencing or signposting areas of biodiversity value outside the revised development footprint, where appropriate, to prevent unnecessary disturbance during the construction phase; and
- providing employee, staff, contractors and visitors education and training and inductions to inform biodiversity issues present on the site and the role and responsibilities in relation to the protection and/or minimisation of impacts to native biodiversity.

The Department acknowledges the impacts have been reduced with the majority of works being located in the existing rail corridor, which has been subject to disturbances by rail maintenance activities and activities associated with surrounding agricultural land uses. The construction footprint was increased in the SPIR to provide a conservative impact figure that reflects a worst-case construction scenario, including large construction sites adjacent to the existing corridor and access tracks to existing roads. The intent of this is to avoid potential project modifications to extend construction footprints during construction. The Department considers this approach appropriate in reflecting this worst-case scenario and requiring biodiversity and species credits based on it. However, the Department acknowledges that the final impact will likely be reduced as the Proponent has

committed to further reduce offsetting requirements by reducing impacts to threatened communities and species where possible during detailed design.

Ecosystem credit species were recorded in the proposal area during the targeted surveys, including the grey-crowned warbler, the varied sittella, the eastern bentwing-bat, the little pied bat and the yellow-bellied sheath-tail-bat. As the proposal area contains foraging habitat for these species, the Proponent has committed to provide offsets to mitigate impacts to the habitat of these species.

The Proponent has committed to implement actions to mitigate adverse impacts to biodiversity during construction, including limiting clearing of native vegetation. The Department considers the commitment to address construction impacts on native vegetation and ensure construction practices minimise harm to retained vegetation, particularly TECs and threatened species, to be appropriate for the proposal. The Department has reinforced these commitments in recommended conditions of approval, which require the Proponent to describe in detail these measures in a Construction Biodiversity Management Plan.

Impacts to koalas can be reduced and offset

Koalas were recorded at two fauna survey sites and four other opportunistic locations along the proposal site. Scats were also recorded at another two locations. Koala records in the OEH Atlas of NSW Wildlife within 10 kilometres of the proposal area are primarily in the northern section of the alignment, and primarily in woodland areas of the Bullara National Park (about 40 kilometres north east of Moree and within 10 kilometres of the alignment at its closest point). Following advice from EESG, the Proponent has included all vegetation zones/PCTs which have Belah (*Casuarina cristata*) as a canopy species as Koala habitat. The tree species provides refuge habitat for koalas during times of extreme heat. The Proponent has also reviewed the grassland mapping and identified several small areas which contain scattered feed/refuge trees. These changes result in direct impacts to koala habitat of 175.25 ha (an increase from 62.77 ha of primary and secondary food tree species identified in the EIS).

Whilst this habitat is fragmented and occurs in small patches over a long rail corridor, with scattered trees surrounded by largely agricultural land, it does reduce the availability of habitat to the koala. Accordingly, this impact will be offset by the provision of at least like for like habitat in accordance with the EPBC Act Environmental Offset Policy.

The Department and EESG do not agree with the Proponent's assertion that the maximum impacts to Koala is not significant. Notwithstanding, the Department considers impacts to koala habitat can be reduced through the Proponent's further refinement of the necessary construction footprint, and has included a condition of approval which requires the Proponent to reduce impacts to koala habitat and advise the Planning Secretary on how this has occurred. The recommended conditions also require the Proponent to provide a minimum offset of 4,556 species credits and to source these offset sites within the IBRA subregion of the impact site, or adjoining subregions. The Department considers these measures would reduce the impact to Koala and assist in the recovery of the koala population of the western slopes and plains region.

No significant impact on aquatic flora and fauna

The key impacts to aquatic ecological systems are caused by the removal and construction of new watercourse crossing structures and access over watercourses for the movement of construction equipment and personnel. This may be in the form of causeways, culvert/pipes or bridging structures.

The Department considers the proposal is unlikely to have a significant impact on aquatic communities, threatened species and endangered populations. The implementation of appropriately designed fish friendly crossing structures, standard construction mitigation measures such as erosion and sediment control would minimise the potential for adverse impacts to watercourses and/or aquatic species.

Notwithstanding, the project will be required to offset riparian vegetation communities (i.e. the Coolabah and River Red Gum TECs) in accordance with the FBA.

Biodiversity offsets will be required

The Proponent has determined that a total of 40,639 ecosystem credits and 20,683 species credits is required to offset the impacts of the proposal. **Tables 6** and **7** provide a summary of the proposed offset credits on direct impacts to the biodiversity values of the revised development footprint.

To encourage the Proponent to reduce community and species impacts through detailed design process and construction, the Department considers the Proponent should review and update the ecosystem and species credit requirements to reflect the final impact zone and has recommended conditions to this effect. The only exception to this is species credits for the koala which requires a minimum species credits of 4,556, which cannot be reduced if impacts to koala habitat are reduced during detailed design and construction. This approach has been endorsed by EESG.

Table 6 | Biodiversity ecosystem offset credit requirements (Source: July 2020 Addendum)

Plant community type/species Ecosystem credits	Credits required
Zone 1 - PCT 27 Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion	900
Zone 2 - PCT 35 Brigalow - Belah open forest / woodland on alluvial often gilgaied clay from Pilliga Scrub to Goondiwindi, Brigalow Belt South Bioregion	1,223
Zone 3 - PCT 39 Coolabah - River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion	93
Zone 4 - PCT 52 Queensland Bluegrass +/- Mitchell Grass grassland on cracking clay floodplains and alluvial plains mainly the northern-eastern Darling Riverine Plains Bioregion	20,102
Zone 5 - PCT 56 Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	8,851
Zone 6 - PCT 56 Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW (Derived - Native Grasslands)	8,294

Plant community type/species Ecosystem credits	Credits required
Zone 7 - PCT 71 Carbeen - White Cypress Pine - River Red Gum - bloodwood tall woodland on sandy loam alluvial and aeolian soils in the northern Brigalow Belt South Bioregion and Darling Riverine Plains Bioregion	23
Zone 8 - PCT 78 River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	549
Zone 9 - PCT 135 Coolabah - Western Rosewood low open tall shrubland or woodland mainly on outwash areas in the Brigalow Belt South Bioregion	354
Zone 10 - PCT 413 Silver-leaved Ironbark - White Cypress Pine - box dry shrub grass woodland of the Pilliga Scrub - Wialda region, Brigalow Belt South Bioregion	250
Total ecosystem credits required for offsetting	40,639

Table 7 | Biodiversity species offset credit requirements (Source: July 2020 Addendum)

Threatened species Species credits	Credits required
Finger panic grass (<i>Digitaria porrecta</i>)	858 (by no of individuals) 1,287 (by habitat area in ha)
Creeping tick-trefoil (<i>Desmodium campylocaulon</i>)	4752
Belson's panic (<i>Homopholis belsonii</i>)	6,630 (by individuals) 2,600 (by habitat area in ha)
Koala (<i>Phascolarctos cinereus</i>)	4,556
Total species credits required for offsetting	20,683

The Department's recommended conditions require the Proponent to retire all biodiversity credits within two years of the project approval. The retirement of credits must be consistent with the NSW Biodiversity Offsets Policy for Major Projects, and can include:

- retiring credits under the *Biodiversity Conservation Act 2017*;
- making payments into the Biodiversity Conservation Fund; and/or
- providing supplementary measures.

The Proponent will seek to combine the project's offset requirements with future Inland Rail projects' biodiversity offset requirements (which have not yet been assessed or determined), subject to endorsement of a holistic strategy by the Department and EESG. The Department considers this approach appropriate as it would allow for adjoining biodiversity values to be captured and reduce the potential for offsets to be located in isolated patches. If this approach does not eventuate, offsets would be retired in accordance with relevant rules associated with this project.

Noxious weeds need to be managed

The Proponent is required to manage weeds in accordance with the *Biosecurity Act 2015* during the construction and operation of the proposal. To minimise the risks of transmitting noxious weeds, the Department has recommended the proponent implement weed management measures and hygiene protocol as part of the Construction Biodiversity Management Sub-Plan.

6.2 Hydrology

The proposal is in major flood catchments and the Proponent's desire to increase the flood immunity of the existing rail line will increase both upstream and downstream flood impacts. The Department required the Proponent to model this significant risk and is generally satisfied that flood impacts can be managed. However, the Department has recommended alternate flood management objectives and independent flood model review to ensure that project design and flood management appropriately responds to the adjoining environment.

6.2.1 Issue

Flooding Impacts

The project is located in three major catchments: the Namoi (15 km of the alignment), Gwydir (103 km) and Macintyre (51 km). Within these catchments, the project crosses sub-catchments of smaller ephemeral creeks and streams and larger watercourses such as Gurley Creek, Tycannah Creek and Croppa Creek.

Parts of the alignment and surrounding catchments are subject to existing flooding. This is predominantly shallow, slow moving and long lasting due to the relatively flat topography. Flooding in the more frequent rainfall events modelled by the Proponent (i.e. the 39% and 10% AEP events) is largely contained within or close to waterways, while 1% AEP events flood larger areas. Residential properties in villages along the railway line, such as Edgeroi, Bellata and Gurley, are subject to flooding at the 39%, 10% and 1% AEP events.

The existing rail line between Narrabri and North Star overtops along approximately 11.1 km of its alignment in a 1% AEP event, to a maximum depth of 0.75 m. The Proponent proposes to increase the flood immunity to the top of formation (i.e. the top of the embankment on which the track is located) to the 1% AEP level for the majority of the line. The project would be designed so that the rail tracks are not overtopped at the 1% AEP event at any location (i.e. water would be above the level of the formation but below the tracks).

Providing this flood immunity requires the existing track and formation to be lifted. This would alter water flow within the floodplain and through the rail corridor resulting in increases in upstream and downstream afflux (water level), velocity (speed of water) and duration (length of flooding) through changing the amount and location of floodwater that would pass through or over the rail corridor.

The EIS considered only upstream impacts of the proposal and did not set clear flood management objectives (FMOs). The Department and EESG considered that the EIS's lack of assessment of downstream impacts was inadequate given the potential sensitivity of downstream land, particularly

within towns and within regional floodplains. The lack of clear FMOs was also not supported, as the Department considered that the project required clear criteria against which to assess flooding impacts. In response to the Department's and EESG's advice, the Proponent undertook further flood modelling and assessed the impacts of the proposal for the 39%, 10%, 1% and 0.05% AEP events. A check of the impacts at the intermediate flood events of 18%, 5% and 2% events was also undertaken to confirm flood impacts. The results of the additional monitoring were detailed in the SPIR.

The Proponent also suggested FMOs in the SPIR that would place limits on the flood impacts (**Table 8**) and conducted further flood modelling as part of the SPIR to assess the proposal's consistency with the FMOs.

Table 8 | Proponent's Flood Management Objectives (FMOs) (Source: SPIR)

	Location	Maximum allowable afflux
Afflux	Residential and commercial	50 mm (10 mm limit for above floor level flooding)
	Cropping paddocks	200 mm
	Stock paddocks	200 mm
	Newell Highway	50 mm
	Other roads	100 mm
	Public infrastructure (excluding simple structures)	50 mm (10mm for above floor level flooding)
	Applicable land uses and other specific criteria	General criteria
Flood velocity	Residential and commercial buildings – no change to the flood hazard regime	Beyond the boundaries of the rail corridor, velocities to remain below 1.0 m/s where currently below this figure and an increase of no more than 20% where existing velocities are above 1.0 m/s
	Cropping paddocks	
	Stock paddocks	
	Roads – no change to the flood hazard regime	
	Public infrastructure (excluding simple structures)	
	Land use	Design criteria
Flood hazard	Residential and commercial	No change in flow hazard regime for people (Table 6.7.1. Flow Hazard Regimes for People, Australian Rainfall & Runoff 2016 (ARR, 2016))
	Roads	No change in flow hazard regime for cars (Table 6.7.2 Interim Flow Hazard Regimes for Vehicles (ARR, 2016))
	Applicable land uses	Design criteria
Flood duration	Residential and commercial – with additional requirement for no increase in above floor level duration	Total flood duration to remain less than six hours where currently less than this figure and an increase of no more than 10% in flood duration where existing flooded durations are above six hours
	Newell Highway	
	Public infrastructure (excluding simple structures)	
	Cropping paddocks	Total flood duration to remain less than 12 hours where currently less than this figure and an increase of no more than 10% in
	Stock paddocks	

	<div> flood duration where existing flooded durations are above 12 hours </div> <hr/> <div> Other roads <div>No more than a 10% increase in flood duration</div> </div>
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The performance of the proposal against its proposed FMOs were assessed; the proposal complies at events up to and including the 1% AEP flood event except for:

- **Afflux:** Four buildings (all at 1%, two in Gurley and two in Croppa Creek); 28 rural property locations; Newell Highway at three locations and two other roads;
- **Duration:** No buildings; 28 rural property locations (no figures provided for roads); and
- **Flood hazard:** Newell Highway at three locations (no figures provided for other locations).

The Proponent has not quantified the number of non-compliances with its velocity FMO but notes they are localised and generally do not extend more than 20 metres from the culvert or bridge structures.

The Department engaged an independent consultant hydrologist to conduct a peer review of the Proponent's assessment, which has informed the Department's assessment. This peer review is provided at **Appendix J – Independent Hydrology Advice**.

Construction water

The Proponent will require water during construction for:

- Bulk earthworks to create the rail formation;
- Environmental management;
- Landscape and rehabilitation; and
- Potable water for construction personnel use.

The Proponent has identified the construction water requirement for the entirety of the project will be approximately 1,215 megalitres (ML) at an average of 24 ML per month.

Sourcing construction water would be the responsibility of the construction contractor. The Proponent has provided a hierarchy of water supply sources that would be accessed in order:

- Commercial water sources;
- Surface water sources from existing licensed sources;
- Recycled water;
- Existing groundwater bores with existing licenses; and
- Establishment of new groundwater bores.

6.2.2 Submissions

Government Agency and Council Submissions

Environment, Energy and Science Group (EESG) noted that the flooding and hydrology assessment required refinement during further design, including conducting additional modelling of free outlet and tailwater effects of the proposal. EESG also recommended that the Proponent continue to liaise with Moree Plains Shire Council about impacts of the proposal.

EESG provided further commentary following EIS exhibition noting:

- The modelling should be revised in consultation with EESG and consider the relevant floodplain management plans;
- An assessment of impacts downstream of the proposal should be undertaken, particularly where affected by new and resized culverts; and
- More detailed soil mapping is required to establish appropriate velocity controls to avoid watercourse instability erosion, and spatial data of existing and proposed infrastructure, as well as modelled flooding, should be provided to allow a more complete review.

EESG's response to the SPIR acknowledged the additional modelling work that had been conducted, and noted that previous comments related to velocity and its impacts on watercourse stability and erosion had not been addressed. It also reiterated its request for the Proponent to provide spatial data.

DPIE Water advised that the Proponent should provide an assessment of the project against the requirements of the *Floodplain Management Plan for the Gwydir Valley Floodplain 2016*, noted the approximate construction water requirement for the project and recommended the Proponent confirm the availability of construction water and assess impacts of water use.

Transport for NSW in its SPIR response:

- requested that the storm and floodwater measures designed for the project match that proposed for the Newell Highway upgrade; and
- suggested that the project not increase flood levels on surrounding roads and private properties.

Moree Plains Shire Council advised that the 'base case' for flooding resulting from the project should be no worsening of pre-project flooding and detailed design should seek to improve this base case. Council also expressed a desire to be involved in the development of the project's detailed design to minimise any negative flooding impacts.

Council also provided a high-level review it commissioned into the EIS hydrology assessment. This review noted that the Proponent's assessment did not provide for a full range of flooding events or used surveyed floor level data to accurately determine impacts. It recommended that the Proponent conduct modelling consistent with Council's Floodplain Risk management study and conduct further modelling of Tycannah Creek.

Council's submission to the SPIR provided a more detailed review of the hydrology assessment. It accepted the proposed FMOs, except for residential and commercial afflux levels, flood velocity and the proposed percentage increase for the duration of longer events. Council also noted that the acceptability of afflux levels for local roads would depend on the absolute depth rather than relative change and advised that modelled flooding would affect land earmarked for future village development at Gurley.

Narrabri Shire Council noted that the project under the EIS would impact on 23 properties and suggested that additional flood modelling is undertaken to refine impacts. Council suggested the project mitigate flooding impacts on towns along the alignment and Council be consulted on this.

6.2.3 Department's Consideration

Flood management objectives recommended to address assessment detail

The Department acknowledges the additional flood modelling work presented with the SPIR. This modelling includes upstream and downstream events in a range of flood events between 39% and 0.05% AEP. The additional flood modelling gives the Department greater confidence about the proposal's flooding and hydrology impacts.

Notwithstanding the additional flood modelling, the Department does not accept the Proponent's FMOs that benchmark the proposal's performance, and considers the additional modelling contains shortcomings that must be addressed prior to the commencement of works that affect flooding.

The Department has recommended FMOs that reflect the level of assessment undertaken and the environmental and flooding characteristics of the area. These are set out in the recommended conditions of approval and **Table 9**.

Table 9 | Department's Flood Management Objectives (FMOs)

	Location	Limit
Afflux	Habitable floors	10 mm
	Non habitable floors	20 mm
	Other urban and recreational	100 mm increase
	Agricultural	200 mm
	Forest and unimproved grazing land	300 mm
	Highways and sealed roads >80km/hr	No increase in depth where aquaplaning risk exists and remains unmitigated. Otherwise 50mm increase
	Unsealed roads and sealed roads <80km/hr	100mm
	Applicable land uses and other specific criteria	Limit
Flood velocity	Areas including watercourses, agricultural land, unimproved grazing land and other unsealed or unprotected areas	No velocities to exceed 0.5m/s unless justified by site-specific assessment conducted by an experienced geotechnical or scour/erosion specialist. In addition, the increase in velocity is to be limited to 20% where the existing velocity already exceeds 0.5m/s
	Ground surfaces that have been sealed or otherwise protected against erosion. This includes roads and most urban, commercial, industrial, recreational and forested land	20% increase in velocity where existing velocity already exceeds 1m/s
	Land use	Design criteria
Flood hazard	Urban, commercial, industrial, highways and sealed roadways	10% increase in velocity x depth (vd) where H1 or H2 category 0% increase in vd where H3 or greater hazard category
	Elsewhere	20% increase in vd
Flood duration	Applicable land uses	Design criteria

	Habitable floors	No increase in inundation duration above floor level 10% increase in inundation duration where below floor level and when existing inundation duration exceeds one hour. Otherwise inundation duration not to exceed one hour
	Roads	10% increase in inundation duration
	Elsewhere	10% increase in inundation duration when existing inundation duration exceeds one hour. Otherwise inundation duration not to exceed one hour

Key changes to the FMOs are:

Afflux: The Department recommends more stringent limits on residences and other buildings. The Department considers these limits are justified as villages along the alignment are already flood-prone and additional afflux impacts are unacceptable. The 10 mm afflux allowance for habitable floors provides an allowance for modelling uncertainties but the expectation is that no additional flooding would occur above floor level.

The Department has also imposed a requirement of no additional flooding on roads with speed limits at or above 80km/h where there is an unmitigated aquaplaning risk. The Department considers this an appropriate road safety measure.

Velocity: The Department recommends a more stringent limit due to the project's location amongst highly erodible and agriculturally productive 'black soil', unless a geotechnical investigation supports a higher velocity.

Flood duration: The Department considers the proposed absolute maximum of six or 12 hours inundation time and a relative limit of 10% increase above this could result in unjustified increases in inundation time and has recommended reduced timeframes. The Department instead recommends shorter time periods and relative limits to duration time.

Whilst flooding impacts on buildings, agricultural land, roads, and other infrastructure will increase because of the proposal, recommended FMO's will moderate these increases. The Department, in recognition of the existing flood affected environment, the isolation of some residences and required design development, has also provided the Proponent with the ability to review FMOs or negotiate mitigation of non-compliances with landowners. In some cases, the Proponent and landowner may be able to reach a mutually agreed outcome instead of changing the infrastructure's design to ensure strict compliance. The Department has recommended a condition of approval to allow this.

Further flood modelling required

The Department recommends that the Proponent undertake further modelling and prepare a Flood Design Verification Report to ensure that the detailed design of the proposal can meet the FMOs established by the Department. These detailed requirements will provide clarity about required methodologies and outcomes and ensure that the final design's performance against the Department's FMOs is supported by robust modelling.

The Department's consultant hydrologist's report (Appendix J – Independent Hydrology Advice) considers the Proponent's modelling of culvert performance used too low a blockage factor and recommended further modelling include a specific (higher) blockage factor and freeboard allowance for underbridges. The Department acknowledges this advice and has recommended that the Proponent's modelling use a blockage factor for each culvert that is consistent with the procedures in *Australian Rainfall and Runoff* (Commonwealth of Australia, 2016).

The Department also recommends a condition requiring the Proponent to engage an independent peer reviewer to certify the detailed design flood modelling and compliance with FMOs to provide further confidence in the proposal's impacts and efficacy of the flood structures to mitigate these impacts. The independent reviewer should also consider the appropriate blockage factor to be applied in accordance with *Australian Rainfall and Runoff*.

Extreme flood management will require flood emergency management plan updates

The proposal will not meet the FMOs for flood events larger than 1%, with or without climate change effects considered. Larger events would cause widespread damage that are beyond the capability of the project to mitigate. In any case, the flooding at each event is generally limited to agricultural land and isolated buildings and does not significantly increase flooding impacts on villages, other than at Bellata. In addition, the assessment indicates that parts of the formation would be at risk of collapse in a 0.05% (1 in 2000 year) event. Approximately 40 buildings are located downstream of these parts of the alignment, including the village of Gurley.

The Department accepts the infrastructure will not withstand the impact of an extreme flood and management measures will focus on evacuation. The Department has recommended that the Proponent revise existing flood emergency management plans that would enable the evacuation of residents in areas downstream of any potential formation collapse, if those residents had not already evacuated under existing procedures.

Ensuring enough water is available for construction

The Department recognises that the project alignment has been in drought through the assessment period. Although drought conditions are easing due to rainfall in the first half of 2020, the region remains drought affected. The resultant shortage of water supply could affect the Proponent's ability to source water from commercial or licensed sources, and the Proponent's use of water for construction could conflict with other users' ability to access water.

The Department and the Water Group therefore required the Proponent to provide further detail about water availability, to provide confidence that water can feasibly be sourced on the market.

The Proponent advised it will obtain potable water from commercial sources. The Department notes that potable water is a minor component of the Proponent's total water use requirements (approximately 2%) and is satisfied that this water is available. The Proponent has identified that sourcing non-potable water from licensed surface water sources is not likely to be feasible as allocations are generally exhausted.

Recycled wastewater is a potential source of construction water. The Proponent has identified that more than 1,300 ML of wastewater is licensed for annual discharge from sewage treatment plants near the alignment.

The Proponent has also investigated water available under existing aquifer access licences and identified 23 existing aquifer licences that have surplus licensed water compared to usage. These licenses have more than 7,000 share units available. These groundwater sources currently receive a full allocation of 1 ML per share per year, which equates to more than 7,000 ML of water per year potentially available for the project. The Department accepts that there is a significant quantity of water potentially available to the project but acknowledges that all this water may not be available as surplus water given that licence holders' groundwater usage would vary each year. The Department has recommended conditions requiring the Proponent to clearly identify the source/s of its construction water and provide contingencies if this water is unavailable.

While the Proponent has not yet secured their construction water supply, it is typical that proponents of infrastructure projects defer that to the construction contractor. The Department is satisfied that the Proponent has demonstrated there is sufficient water supply in existing licences for the proposal's construction.

6.3 Noise and Vibration

The proposal will have construction and operational noise and vibration impacts at sensitive receivers along the alignment, however the Department considers that these impacts are manageable and acceptable.

Construction noise exceedances are reflective of an environment with low background noise levels, and only three receivers will experience construction noise above the highly noise affected level of 75 dB(A). The Department expects that noise impacts will be relatively short as construction on a linear project such as a rail line continuously moves as construction is completed and works advance.

87 receivers will be impacted by operational noise above relevant thresholds with full Inland Rail operation in 2040 without mitigation. The Proponent has committed to reducing these impacts through a combination of noise walls and at-property treatments, in accordance with NSW rail noise policy. The Department has recommended conditions to review and monitor the efficacy of these operational noise mitigation measures.

6.3.1 Issue

The existing environment along the project alignment is a mixture of large agricultural properties and rural villages, characterised by typically low background noise levels. Areas adjacent to classified and local roads are subjected to traffic noise while those adjacent to the rail line and associated agricultural infrastructure experience intermittent noise.

Construction noise will impact sensitive receivers

Extended day-time construction hours (6am to 6pm Monday to Sunday and Public Holidays) are proposed, with most works undertaken during these periods. Works outside of this period are proposed in the following circumstances:

- where no sensitive receivers are located within 700 m of construction works and 1500 m of bridge works;
- negotiated arrangement with an individual or a group of impacted property occupiers has been reached;
- during temporary rail possessions where it is necessary to complete work for safety reasons (such as installation of T-spans at Jones Avenue);
- delivery of materials is required out of hours by the NSW Police Force, Roads and Maritime Services, National Heavy Vehicle Regulator or other authority, for safety reasons; and
- it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm.

These works would be guided by the requirements of an Environmental Protection Licence (EPL) or Out-of-Hours Works (OOHW) protocol.

Residences and other sensitive receivers are primarily located in towns and villages along the alignment. The Proponent has identified the number of residences and other sensitive receivers predicted to be impacted by noise levels above the Noise Management Levels (NML) based on different construction activities, including simultaneous activities. This represents the maximum construction noise impact from the project. Exceedances of NML's is typical of major infrastructure projects and identify when the Proponent must initiate management and mitigation measures. Exceedances of NML's greater than 20 dB are considered highly intrusive.

The proposal will impact up to 1580 sensitive receivers affected by any individual construction scenario, and up to 1840 receivers under a worst-case cumulative scenario that includes concurrent culvert, level crossing and road bridge works. Of the 1580 receivers affected above the NML by individual construction scenarios, 73 will experience noise impacts above 55dB(A) and three will experience noise above the highly noise affected criteria of 75 dB(A).

The Proponent assessed impacts of night-time works on sleep disturbance. An exceedance occurs where noise levels exceed background levels by 15 dB(A) at the external façade of the receiver. The assessment predicted the sleep disturbance screening criterion is likely to be exceeded at some receivers in all construction scenarios. As with the general construction noise impacts, the cumulative impact of multiple construction scenarios represents the worst-case impact.

The main sources of construction vibration would be excavation, rolling, piling and compaction works. The Proponent has indicated 291 residential receivers, two educational institutions and three places of worship are within applicable buffer distances for human comfort criteria and therefore potentially impacted by general construction activities. Thirty-seven residential receivers are potentially impacted by pile boring for the construction of the Jones Avenue Bridge in Moree.

Construction methodology and duration of specific work will be determined prior to detailed design and outlined in the Construction Environmental Management Plan. The Proponent has committed to implementing management and mitigation measures to prevent damage to receivers from vibration.

Operational rail noise will require mitigation

The *Rail Infrastructure Noise Guideline* (EPA 2013) (RING) defines noise trigger levels for new and redeveloped rail lines and has been adopted by the Proponent to guide its operational design objectives. The operational noise assessment predicted noise levels for the future build scenarios (2025 and 2040). It predicted that the RING trigger levels would be exceeded at 36 receivers between Narrabri and North Star in 2025 and 87 in 2040.

The assessment factored train horns into the project's operational noise levels. It found train horns would exceed the maximum noise trigger levels at sensitive receivers located within 282 metres of a high noise level horn, or within 180 metres of a low noise level horn. An increase in the number of horn events is expected due to the projected increase in train numbers in the future. ARTC have committed to investigating specific mitigation measures for affected sensitive receivers during detailed design.

An operational road traffic noise assessment was undertaken to identify any impacts from the proposed Jones Avenue bridge. The assessment was undertaken in line with the Road Noise Policy (DECC 2011) and Noise Criteria Guideline (RMS 2016), which found that noise mitigation for the road extension was not necessary for 2020, and that only one receiver was eligible in 2030.

6.3.2 Submissions

Community Submissions

Noise issues raised in the community submissions included:

- Structural vibration impacts to an older residence;
- Construction noise impacts on sensitive receivers;
- Operational noise impacts on residences, particularly at night; and
- Operational noise impacts on residences near level crossings from the use of train horns, and the bells installed on the level crossings.

Government Agency and Council Submissions

Moree Plains Shire Council expressed concern that operational noise could not be satisfactorily mitigated via a noise wall, and at-property treatments such as acoustic seals and double glazing would affect evaporative cooling. Council also noted a shift to air-conditioning would affect residents' electricity costs.

In responding to the SPIR, Council reiterated its concerns about impacts on evaporative cooling and raised concerns at the lack of assessment of caravan parks and other buildings such as short stay accommodation.

Narrabri Shire Council noted 152 residences would experience noise exceedances and requested the Department mandate that the Proponent implement noise and vibration management and mitigation measures as part of the conditions of approval.

EPA requested that the Proponent provide further justification for undertaking construction outside of standard construction hours, and expressed concern at the Proponent's intention to construct outside

of standard construction hours with noise exceedances. The EPA also indicated that the Proponent used the incorrect sleep disturbance noise criteria in the noise assessment and requested the noise assessment be updated to include the correct criteria in the Submissions Report. The EPA recommended conditions including the Proponent implement noise mitigation measures to minimise noise impacts where noise exceeds the NMLs, and for construction of the project to be restricted to standard construction hours.

The EPA confirmed that adequate responses were provided in the SPIR and noted the requirement for the Proponent to implement its noise and vibration management framework and provide an operational compliance assessment, to reduce and manage noise exceedances.

6.3.3 Department’s Consideration

Construction noise exceedances are a result of quiet background noise levels

The Department notes that the relatively high numbers of construction noise exceedances identified in the assessment are a function of the low background noise levels of the project’s rural setting. The Proponent has set an NML of 35 dB(A) based on the project’s setting and extended construction hours. The Department considers this a conservative level and as a result many construction activities would exceed this level.

The worst-case construction scenario identifies up to 1580 impacted receivers and the cumulative scenario identifies 1840 impacted receivers, with exceedances up to 43 dB above the NML of 35 dB(A). However, noise levels at the majority of receivers are moderate and fall within the 35-50 dB(A) range, as shown in **Figure 6**, with only 73 receivers experiencing noise greater than 55 dB(A) (where noise levels become highly intrusive and noise management levels are typically enhanced), and only three greater than the highly noise affected level of 75 dB(A) under the worst-case individual scenario.

This demonstrates that the high number of noise exceedances is due to the project’s quiet setting rather than the construction activities being more noisy than typical construction activities. The Department also notes this worst-case scenario is conservative as it is highly unlikely that track reconditioning, drainage and culvert works as well as bridge construction would occur concurrently due to construction sequencing. The Department is satisfied that most sensitive receivers will not experience construction noise that would affect their daily activities or their residential amenity.

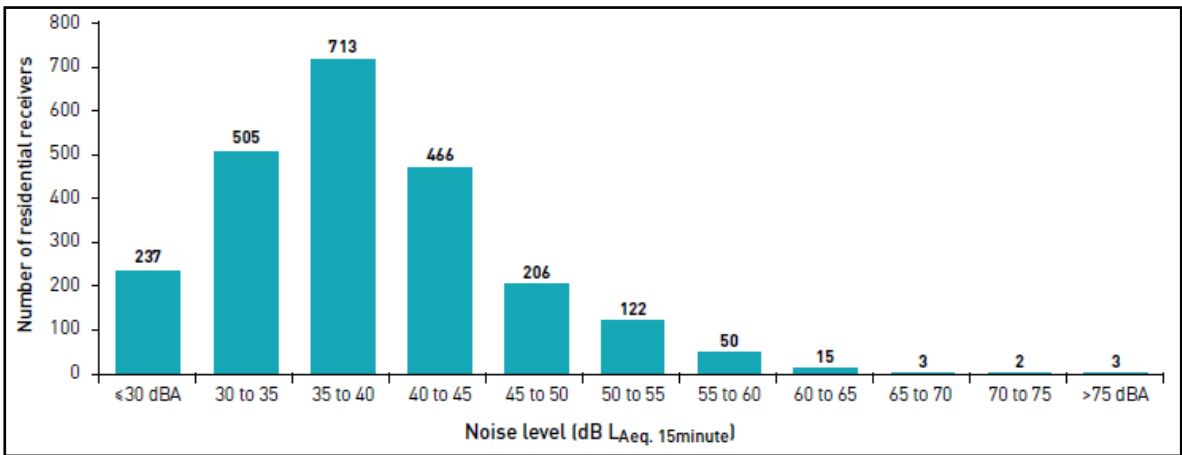


Figure 6 | Highest construction noise level from any construction scenario (source: SPIR)

The Proponent has committed to managing construction noise through its *Inland Rail NSW Construction Noise and Vibration Framework* which sets out standard program working hours, community communication protocols, and mitigation and management measures to guide construction activities. This includes preparing Construction Noise and Vibration Impact Statements for specific activities, particularly for works outside of standard construction hours. Specific measures include proactive engagement with the community and impacted receivers on work schedules, exceedances, and any compensatory measures that will apply.

The Department supports the Proponent's commitment to develop these statements and has recommended the preparation and implementation of a Construction Noise and Vibration Management Plan to ensure appropriate measures are in place where exceedances are predicted, and guide its commitments and requirements under this approval. The Department is satisfied that these measures will provide the appropriate management of construction noise impacts.

The Department's recommended construction hours balance construction efficiency with residential amenity

The Department supports extended day time construction hours of 6am to 6pm on all days given that much of the alignment is remote from sensitive receivers. Extended hours allow for faster progression of works along the alignment, reducing the duration of impacts for affected receivers. However, the Department considers that some respite is necessary for receivers and recommends that construction cease on every second Sunday. The Department considers this is a reasonable compromise between efficient construction works that reduce the duration of works at any given location and providing acceptable amenity to nearby residents.

The Department notes that up to 1580 receivers could be impacted beyond sleep disturbance criteria. For this reason, the Department does not support 24-hour works in all cases. The Department supports 24-hour works where these works are distant from sensitive receivers. However, the Department disagrees with the Proponent's suggestion that they be allowed outside of a 700 m (general construction work) and 1500 m (bridge works) buffer from sensitive receivers. The Department considers this is too broad a benchmark and that noise levels have not been quantified at receiver locations to justify this position. The Department instead recommends allowing 24-hour works when they do not result in background noise levels greater than 5 (dB)A above background noise levels, or when they do not trigger the sleep disturbance criteria.

The Department also recommends a condition allowing for extended construction hours where agreed to with affected landowners. The Department considers the rural nature of the project with a low density of affected receivers allows the Proponent to agree alternative respite measures directly with landowners. Additional construction hours may also be permitted through an Environmental Protection Licence via a separate process that requires contractors apply to extend hours. This is managed and regulated by the EPA.

Construction vibration can be managed to acceptable levels

Construction vibration can generate impacts on human comfort and the structural integrity of nearby buildings. The Department is satisfied that the Proponent has sufficiently identified the vibration-generating activities that are likely to cause discomfort to the surrounding community and/or property damage. Whilst the Department is satisfied that the Proponent has identified appropriate safeguards to manage vibration impacts, the Department has strengthened these commitments by recommending:

- compliance with construction vibration criteria for human comfort and structural integrity;
- pre-and post-construction dilapidation surveys; and
- owners of properties at risk of exceeding the screening criteria are notified before construction that generates vibration commences in the vicinity of such properties.

Operational noise impacts will be mitigated

Increased rail noise is expected, given the increase of rail services in a rural locality. Despite mitigation measures, rail noise will be noticeable to varying degrees. Operational train noise was raised in most of the public submissions.

The Proponent has committed to measures to monitor and reduce operational impacts. These include noise reduction at the source, near the source (noise walls, noise mounds) and at-receiver treatments. These treatments will be offered after landowner consultation and individual agreement.

Noise barriers are proposed at several locations, including Bellata, Gurley, Moree, Croppa Creek and North Star. The final decision on the inclusion of noise walls will be subject to ongoing consultation with affected communities, and noise barriers may not proceed if there is strong community sentiment against them. Operational noise exceedances by locality with and without noise barriers are provided in **Table 10**, demonstrating the effectiveness of this mitigation method.

The Department considers operational noise impacts of the proposal are moderate and can be effectively mitigated to reduce residual impacts. The Department agrees with the Proponent's commitment to consult the community about this form of noise mitigation and notes if barriers are not implemented, the Proponent will provide at-property treatment as agreed with landowners.

Table 10 | Exceedances with and without noise barriers

Noise Barrier Location	2025 without barriers	2025 residual exceedance with barrier	2040 without barriers	2040 residual exceedance with barrier
North Star	8	1	10	4
Croppa Creek	1	0	8	2
Moree	11	3	26	14
Burrington Road (Moree South)	4	0	11	2
Gurley	2	0	5	2
Bellata	6	0	16	2
No Barrier	4	4	11	11
Total	36	8	87	37

Options for at-property treatments include mechanical ventilation, air conditioning or other treatments such as double-glazing windows or cladding. The Department notes Moree Plains Shire Council's concerns about the impacts of at-property treatment on evaporative cooling, and that some architectural treatments would not be suited to older style houses.

The Department requires the Proponent develop an Operational Noise and Vibration Review (ONVR). The purpose of this review is to confirm the accuracy of operational noise predictions and confirm the type and effectiveness of mitigation measures. To ensure these measures are safeguarded into future operations, the Department also requires an Operational Noise Compliance Report (ONCR) to report on operational stages of the project to verify noise performance and to detail performance of the proposed mitigation measures.

The Department also recommends that operational noise mitigation measures, such as architectural treatments, should be bought forward and implemented during the early stages of construction to assist in addressing construction noise impacts.

6.4 Traffic

The project provides significant regional and interstate transport benefits by facilitating greater capacity in the freight rail network. The road network in the vicinity of the project will not be significantly affected by the construction or operation of the project. There are a significant number of level rail crossings providing both public and private access that will be affected, however access will be maintained during construction in consultation with property owners and level crossings be updated to meet current standards. During operation, there will be some level crossing delays due to increased train frequency, however these delays will be localised, infrequent and will not adversely affect the movement of traffic in a significant way. All level crossings will be assessed against current safety requirements and upgraded if necessary.

6.4.1 Issue

The local public road network in the project area comprises national, State and local roads, and includes the Newell and Gwydir Highways. The Newell Highway runs generally north-south and parallel to the existing rail corridor in the project study area. The Gwydir Highway runs generally east-west in the project study area and passes through Moree as Alice Street.

The existing road network generally performs at a good level of service (LoS). The Newell Highway has a peak hourly volume of approximately 210 vehicles in both directions near Bellata and 180 vehicles north of Moree, and generally operates at a LoS of A. Local roads operate at a LoS of A or B. The network experiences seasonal variation in activity with increased heavy vehicle traffic (in the form of trucks transporting grain and farming machinery moving between properties) during harvest season. The Proponent has considered seasonal variation in its assessment.

The existing rail corridor in the project study area caters for both passenger and rail freight services. The Northern Tablelands Xplorer is a passenger rail service that connects Narrabri, Bellata and Moree with Sydney. One return passenger train operates per day. There are no regularly scheduled freight trains north of Narrabri, but trains operate within the project area on a seasonal basis to serve grain freight. Up to seven trains operate per day travelling south from Moree at the peak of grain season.

The project would have temporary impacts on local road traffic during construction with acceptable changes to level of service (with roads maintaining a LoS B). The Department acknowledges that impacts are unavoidable but can be managed or mitigated through the Proponent's commitments, and the Department's recommended conditions of approval.

The operation of the project is expected to generate maintenance and operational traffic; however the total number of additional vehicle movements is expected to be minimal and unlikely to adversely affect the operation of the local road network. Although the project will result in additional delays at level crossings, these delays are predicted to be minor and acceptable.

6.4.2 Submissions

Community Submissions

Key traffic, transport and access issues raised in public submissions include:

- maintenance of access to private property during construction;
- retention of private level crossings to ensure ongoing daily operations, particularly farming; and
- traffic and access impacts caused by the construction and operation of the road bridge over Jones Avenue.

Government Agencies and Council Submissions

Transport for NSW (TfNSW) provided comments in its submission on the EIS around:

- level crossing impacts and consideration of grade separated crossings;
- road bridge design; and
- potential short-stacking at level crossings.

TfNSW reiterated matters raised in response to the EIS and provided the following comments in its submission on the SPIR:

- additional road traffic impacts due to rail possessions;
- coordination of construction program and design with parallel Newell Highway upgrade;
- access to works areas from public roads; and
- recommended conditions requiring a rail possession strategy, a construction traffic management plan, and a pre-construction road condition survey report, if the project is approved.

Narrabri Shire Council raised the following issues in its submission on the EIS:

- safety and operational efficiency of the Newell Highway and level crossings;
- the need for a site-specific construction traffic management plan;
- consultation about construction works (especially during harvest time) and level crossing changes; and
- recommended that any new track required at level crossings be on the western side of the rail line.

Moree Plains Shire Council raised the following concerns in its submission on the EIS:

- severance caused by using the existing rail corridor through Moree;
- consideration of grade separated crossings at the Gwydir Highway, Anne Street and to the south of Moree;
- assessment of traffic impacts, including the proposed Jones Avenue bridge; and
- access, amenity and severance impacts on neighbouring properties.

6.4.3 Department's Consideration

Newell Highway performance will be maintained

During construction, the number of vehicles on the Newell Highway is expected to increase from approximately 130 vehicles per hour to approximately 250 vehicles per hour during peak hour. In addition, there will be an increase in vehicles due to the temporary suspension of rail services due to rail possessions.

Despite the increase in vehicles from construction vehicle movements and rail possession, the Newell Highway is expected to comfortably operate within the LoS B threshold of 500 vehicles per hour including seasonal variations in truck movements and displacement of rail freight to road. Similarly, other roads in the local network are not expected to be significantly impacted. All local roads have an existing LoS of A or B and the addition of approximately 120 vehicles per hour in a worst-case scenario will not cause any of these local roads to fall below a LoS of B.

To ensure the LoS of the local road network does not deteriorate beyond predicted levels, the Proponent has committed to manage construction traffic movements along local roads and arterial roads in consultation with council and public transport operators including during harvest season and rail possession periods. The Department therefore considers that the additional construction traffic will not adversely affect the LoS of the road network during both peak and non-peak harvesting periods.

Rail possessions will accommodate peak harvest seasons

The Department recognises that possession of the existing rail corridor and temporary suspension of rail services is a necessary requirement to ensure that track upgrade works are carried out as efficiently as possible and worker safety is maintained.

During peak grain season (November to April), the Proponent will suspend rail possessions and allow for freight train services to operate for the transportation of grain. The Proponent will provide alternative public transport services/arrangements such as replacement bus services during possession periods and other interruptions to operation of the rail passenger services and will undertake any diversions of existing passenger rail traffic in consultation with relevant stakeholders.

Property access during construction will be maintained

Construction works along the project rail corridor will result in minor disruptions to traffic accessing private properties through changes to level crossings and temporary closures of individual and shared driveways. These access disruptions are temporary and are generally time limited to when construction is in the affected area.

The Proponent has committed to maintaining property access with suitable alternative access arrangements provided where required, and for affected landowners to be consulted in advance regarding alternative access arrangements. The Department has reinforced and strengthened these commitments in the recommended conditions of approval by requiring the Proponent provide affected properties with temporary alternate road and level crossing access as agreed with the landowner.

Level crossing treatments will be subject to stakeholder consultation and review

The project rail corridor is intersected by 72 formal level crossings, comprising 38 public crossings (which are located on public roads and include Crown roads that provide access to a single property) and 34 crossings located on private roads or maintenance access tracks. Within Moree, the road network crosses the existing rail corridor at the Alice Street/Moree Bypass intersection to the north and at Bullus Drive to the south of Moree station.

The Proponent has prepared a Level Crossing Treatment Methodology which sets out its evaluation process in dealing with public and private level crossings along the project rail corridor, including:

- identifying and classifying the level crossings;
- evaluating whether such crossings should be retained, consolidated or closed; and
- determining whether upgrade works should be undertaken to install active or passive protection and ensure all retained level crossings meet relevant infrastructure standards, guidelines and Inland Rail operational criteria.

Upon the implementation of the methodology against each formal level crossing, the Proponent has formulated the preferred treatment for each crossing: the upgrade of 14 level crossings, the retention of 49 and the closure of nine due to consolidation or redundancy. Relevant stakeholders including landowners and roads authorities are required to be consulted on preferred treatment options prior to any implementation.

The Department supports the use of the comprehensive methodology with stakeholder consultation to confirm the future treatment of each level crossing. The Department has reinforced this commitment by recommending a condition to require the Proponent report the results of the review to the Planning Secretary. These reports are to describe the additional protection treatment proposed for each retained crossing that requires upgrading and justify any proposed closures. The reports must also consider the potential for short-stacking (i.e. inadequate queuing distance to level crossings on secondary roads perpendicular to main roads) and measures to avoid this where reasonable and feasible.

The Proponent has committed to review the operation of level crossing treatments once the project has commenced operation, to confirm that the level of protection continues to be appropriate and that the infrastructure is appropriate for the surrounding traffic conditions and safety. The Department supports this commitment but strengthens the review process by requiring the Proponent undertake performance reviews within 12 months and at 10 years following the commencement of full Inland Rail operations. These performance reviews will ensure that level crossing treatments are appropriate and

effective, and if residual adverse traffic impacts are identified, additional measures can then be implemented.

Increased train movements will not have a significant impact on crossing delays

Inland Rail will increase the frequency of train movements on the existing rail line. An average of 10 trains per day would be travelling on the section of the project north of Moree (between North Star and Moree) and 12 trains per day travelling on the section of the project south of Moree (between Moree and Narrabri) when Inland Rail commences operations in 2025, increasing to 19 and 21 trains per day respectively by 2040.

The key operational traffic impact is travel time on the road network due to crossing delays from increased train activity. The increase in the frequency of rail traffic is expected to affect a small number of vehicles and have local impacts. For example, at the Alice Street / Gwydir Highway level crossing, the Proponent's assessment predicts that the number of vehicles affected by a given train crossing may increase from 22 to 27 between 2025 and 2040 with the cumulative delay to all vehicles increasing from 28 minutes to 33 minutes.

While there will be some inconvenience to landowners and the general community with regards to more frequent train movements, the Department is satisfied this impact would not cause significant inconvenience as residents will not experience a delay at every attempt to cross the rail line given that trains would operate at an average rate of approximately one train every two hours at Inland Rail commencement in 2025.

The assessment considered the traffic impact of the project's operation during peak harvest season. Its operation is not expected to detrimentally impact on harvest machinery moving between farms or grain transportation from farm to silo given the infrequent requirement to stop at level crossings. Moreover, overall harvest traffic is expected to decrease as the project will relocate some of the road freight task to rail, thereby reducing the heavy vehicle freight traffic on the road network

6.5 Jones Avenue Overbridge

Moree Council and Transport for NSW sought the relocation of the proposed Jones Avenue Bridge to address land use planning initiatives in south-east Moree. The overbridge as proposed facilitates connectivity within Moree in response to the potential blockages of level crossings. The Department considers there is merit in relocating the proposed bridge subject to ongoing design, consultation with key stakeholders and environmental review.

6.5.1 Issue

The application proposes a new road overbridge and road connections between Jones Avenue to the west of the project rail corridor (between Warialda Street and Joyce Avenue) and Tycannah Street to the east of the rail corridor in Moree (the Jones Avenue Overbridge). The key purpose of this bridge is to provide a grade-separated road crossing to allow emergency vehicles to cross the rail corridor in Moree if both existing level crossings are blocked by trains. The bridge would also enable light vehicles, cyclists and pedestrians to pass over the rail corridor in general traffic conditions. Heavy vehicles would also be able to temporarily use the overbridge when there is a blockage at the level

crossings. The proposed bridge would require road closures at the intersection of Jones and Joyce Avenues.

Since the Jones Avenue bridge was proposed in the EIS in 2017, Moree Plains Shire Council and the NSW Government commenced significant land-use investigations to the south-east of Moree. Council has advanced land use, transport and design studies for its proposed Moree Intermodal Park, also south-east of the Moree township. The NSW Government has also announced the investigation of a Special Activation Precinct (SAP) in Moree and is undertaking preliminary land use and infrastructure strategies. Both Council and Transport for NSW suggest that a grade-separated bridge in Moree should be relocated to the south to provide access to these sites.

6.5.2 Submissions

Community Submissions

Submissions from the local community raised concern with noise and vibration, and amenity impacts of the Jones Avenue bridge.

Government Agency and Council Submissions

TfNSW's submission to the EIS supported the Jones Avenue bridge in principle. The response to the SPIR suggested the location of the Moree bridge should be deferred, to provide for further consideration of traffic and safety impacts and provide better coordination with the Moree SAP investigations.

Moree Plains Shire Council's submission to the EIS did not oppose the Jones Avenue bridge but suggested that the bridge design required further work and the bridge should cater for heavy vehicles. Council also suggested that a second grade-separated bridge should be considered to service a future east-west bypass of Moree.

Council's response to the SPIR advised that Council no longer supports the Jones Avenue bridge location, due to further investigation work for its proposed Moree Intermodal Park that identifies a preferred bridge location to the south of Moree Airport, approximately four kilometres south of the Jones Avenue location (**Figure 7**). Subsequent correspondence requested that conditions of approval require the Proponent to construct a bridge to the south of Moree.

Council provided copies of land use, transport and engineering studies it had completed to support its proposed Moree Intermodal Park, including its preferred overbridge location to the south of Moree Airport. This has informed Council's updated position since the EIS exhibition that a location south of the Moree township is the more appropriate location for a road overbridge. Council no longer supports the Jones Avenue bridge as it:

- does not respond to future land use planning;
- does not provide for a heavy vehicle bypass;
- causes negative impacts on the local road network;
- raises safety and security concerns; and
- causes traffic, noise and visual amenity impacts.

Council also provided correspondence from emergency services providers that confirms a relocated overbridge would provide acceptable emergency response times, and from the Moree Local Aboriginal Land Council that supported Council's concerns about safety aspects of the proposed bridge.



Figure 7 | Moree Plains Shire Council's suggested bridge location (Source: Nearmap)

6.5.3 Consideration

Jones Ave bridge could proceed subject to mitigation and management

The need for a grade separated vehicle crossing in or near Moree is required to address emergency service and general vehicular access if both level crossings are simultaneously blocked by a train incident. The Department considers that the proposed Jones Avenue bridge would provide an acceptable solution to local traffic and connectivity impacts caused by the proposal, but also notes that it would only serve local traffic and not serve Council and State-led economic development initiatives in Moree.

Moree Plains Shire Council's submission articulates concerns with the Jones Avenue location, particularly in relation to its traffic function and community safety and integration. Council also argues that the pedestrian component of the proposed bridge would create entrapment risks for its users. The bridge may also divert east-west traffic from the Gwydir Highway to Jones Avenue, which would cause safety and severance risks to communities in south Moree. Whilst the Department acknowledges these issues, it considers that they could be addressed through detailed design and operational management measures.

The relocation of the Jones Avenue bridge has strategic merit but requires further review

Council has stated that the proposal would not provide for full-time use by heavy vehicles as it would not be designed to the specifications for a regular heavy vehicle route, and is a missed opportunity for a heavy vehicle rail crossing. Council's submission also provided analyses of potential local and regional road network upgrades to support its case for the bridge to be relocated to the south of the Moree township. This finds that a relocated bridge would serve traffic movements within Council's proposed Intermodal Park as well as forming part of a potential future east-west bypass of the Moree township.

The Department recognises the development of Moree SAP and Moree Intermodal are important for the economic success of Moree and the region into the future. Preparatory work undertaken on these projects since the lodgement of the EIS presents an opportunity for the Proponent to re-evaluate the potential grade separated crossing locations under the proposal. The Department acknowledges the Proponent's commitment to pursue a mutually beneficial outcome in consultation with Council and the Department.

The Department has not directed the Proponent to relocate the bridge to the south of Moree, as requested by Council. While Council's submission makes a case for this, the Department has not been provided with a detailed assessment of the environmental impacts of a relocation and is satisfied that the bridge could be built at Jones Avenue. Notwithstanding, the Department has recommended a condition of approval requiring a Transport Network and Connectivity Analysis to provide a holistic and comparative analysis of alternative locations for the grade separated crossing. This investigation will need to have regard to future land use planning, existing and future road networks, community safety and severance, and environmental impacts of a relocated bridge. The Department requires the analysis to be undertaken in collaboration with Council, TfNSW and the SAP team within the

Department, and build on the land use and infrastructure investigations undertaken by all parties to complete the analysis.

Should the analysis identify a grade separated crossing at a location south of Moree to align with the proposed SAP, an approval of the Secretary would be required.

The Department also recognises that additional train movements through Moree may also affect pedestrian and active transport connectivity in Moree. The analysis must also consider opportunities for additional or upgraded pedestrian crossings within Moree.

The condition requires the analysis to be completed prior to construction of a bridge and would require that all approved crossings arising from the analysis are completed prior to the full operation of Inland Rail.

6.6 Heritage

The proposal will impact on Aboriginal and non-Aboriginal heritage items. Two known Aboriginal heritage sites with archaeological potential will likely be impacted and further investigation is required for the expanded SPIR footprint. The Department considers the impacts to these items are acceptable subject to the Proponent's mitigation measures and supports the commitment for further investigations of additional areas to be undertaken. The Department is confident that Aboriginal cultural heritage identified through this process can be appropriately managed in consultation with Aboriginal stakeholders.

The locally listed Moree Railway Station will be altered by the proposal, although the station building itself will be unaltered. The Department is satisfied that the impacts are modest and justified by the overall strategic and economic benefits of the proposal.

6.6.1 Issue

The proposal will impact on two known Aboriginal sites with archaeological potential

The EIS identified four recorded sites within 50 metres of the project. Site surveys undertaken for the project identified nineteen new sites. The assessment found that the project may result in impacts to five surveyed areas of moderate or higher archaeological potential. Other areas that would be impacted along the alignment generally comprised sites containing isolated finds and artefact scatters of low archaeological potential in disturbed contexts.

The SPIR altered and expanded the construction footprint, which has removed several known areas with moderate to high archaeological potential from the construction footprint. The areas of moderate to high archaeological potential remaining in the construction footprint include the Croppa Creek and adjoining slopes and terraces (survey area 55), and the area surrounding site NNS AS1 associated with the proposed Newell Highway overpass (survey area 15).

Survey area 55 is a terrace landform in proximity to fresh water and reliable food sources. These characteristics are commonly associated with previous Aboriginal occupation. This area has moderate archaeological potential where deposits may be present below the depth of current disturbance and modern flood deposits.

Site NNS AS1 (associated with survey area 15) is situated outside the existing rail corridor but may be affected by the proposed Newell Highway overpass. This area was assessed as having moderate potential based on the nature of the landform, the presence of a comparatively high number of artefacts, and the lower level of disturbance in this area when compared to other areas subject to cultivation.

The expanded footprint is required to be surveyed and may contain Aboriginal heritage items. The Proponent has committed to prepare a methodology to investigate the expanded footprint prior to construction within the expanded footprint.

The Proposal will impact on non-Aboriginal heritage items and heritage values

The non-Aboriginal heritage assessment identified the locally listed Moree Railway Station (listed on the *Moree Plains Local Environmental Plan 2011* and Railcorp's section 170 heritage register). The proposed works to this station include a southerly extension (approximately 45m in length) and straightening of the eastern platform to accommodate the relocation of passenger service trains, addition of platform shelters (awnings), as well as the potential construction of a safety fence along the western platform edge to separate passengers from the Inland Rail operational mainline.

The Statement of Heritage Impact addendum that finds the proposed works at Moree Station under the current design would not physically impact on the station building and would have a minor physical impact on the (predominantly non-heritage) surfaces of the platform. However, the proposal will impact on the rare concrete post and panel eastern platform of the station.

The Proponent also identified several potential items with heritage value within and in the vicinity of the proposal site. These items are predominantly rail related and include the rail formation, bridges (such as Croppa Creek), culverts of varying construction materials and age, present and former stations, grain rail sidings with grain silos, other rail related structures and infrastructure.

The project would result in direct impacts to the rail bridge over Croppa Creek and several surviving underbridge components constructed of timber elements. The Statement of Heritage Impact addendum submitted with the SPIR also identified the potential demolition and removal of the platforms and buildings at Edgeroi, Gurley and Bellata during track realignment works.

6.6.2 Submissions

Government Agency and Council Submissions

Environment, Energy and Science Group (EESG) accepted the approach of undertaking additional investigations for the expanded construction footprint prior to commencement of works subject to appropriate consultation with the registered Aboriginal parties (RAPs).

Heritage Council of NSW noted that the Croppa Creek rail bridge has been identified as a potential heritage item of local significance, and nine heritage listed items are located within 100 metres of the proposal area. The Heritage Council recommended impacts to Moree Railway Station be avoided or minimised, and a suitably qualified and appropriately skilled heritage architect or consultant be involved with the project works. The agency requested it be consulted in the preparation of the

Heritage Management Sub-plan, as well as during the detailed design phase of the Moree Railway Station works.

Correspondence received after the SPIR exhibition identified that the eastern platform of Moree Station's precast concrete post and panel design has heritage significance and recommended that impacts to this platform should be avoided.

Transport for NSW (TfNSW) requested that the design for any proposed works or alterations to TfNSW assets (i.e. the stations) are endorsed by TfNSW.

6.6.3 Consideration

Impacts to Aboriginal heritage can be appropriately managed

The proposal may impact on two known sites within the EIS footprint, subject to the detailed design of the proposal and the necessary depth of soil removal. One site (NNS AS1) is of moderate archaeological potential and the other (the Croppa Creek terrace formation) is of moderate to high potential. The Department accepts that the proposal's use of the existing rail corridor limits the extent to which these can be avoided. The Proponent has committed to undertaking further survey work and, if required, excavating items if detailed design identifies the potential for disturbance below the depth of existing disturbance. The Department considers this measure appropriate, which would be outlined in the project's Construction Heritage Management Plan.

The Department notes that the expanded footprint requires survey and there is potential to impact on additional listed or unlisted Aboriginal sites or areas of archaeological potential. The Department considers conducting the surveys prior to construction impacts but after determination of the application acceptable because the assessment carried out for the original construction footprint was developed with appropriate consultation and provides a reasonable level of understanding of potential impacts.

The Proponent has committed to developing a methodology for carrying out additional Aboriginal cultural heritage investigations, with input from the registered Aboriginal parties (RAPs) prior to works within the expanded construction footprint. This approach would be based on the methodology followed for the assessment of the EIS footprint. The Department considers this approach acceptable as it provides for appropriate Aboriginal cultural heritage investigation prior to impacts occurring and has recommended a condition of approval requiring that this investigation occur.

Non-Aboriginal impacts are acceptable

The Department acknowledges that it is not possible to avoid all impacts to Moree Railway Station and that operational requirements of the platform design will impact on the heritage fabric of the station. The station will remain a working passenger station with an existing history of addition, demolition and reconfiguration in response to the changing needs of its users. The works will not directly impact the existing station building and will have a minor impact on the station's setting. The Department notes Heritage Council advice about the post and panel platform and has recommended a condition of approval requiring the platform extension to minimise impacts on it.

To ensure that the identified heritage values are respected and enhanced where possible, the Proponent has committed to seeking design input from an appropriately qualified and experienced heritage architect. The Department agrees with this approach and has included this measure as a requirement in the Heritage Management Sub-Plan, along with the provision to identify measures to prevent vibration and direct impacts to the station.

The proposal may also (subject to detailed design) alter or remove the platforms and buildings at Edgeroi, Gurley and Bellata Railway Stations. The built heritage fabric at these stations is degraded or absent, however the heritage assessment determined that the stations display local heritage significance due to their historic and social values. The Department notes these items are of lower heritage significance and accepts their removal, subject to a condition requiring an interpretation strategy. Photographic archival recording should also be carried out for all identified potential heritage items along the alignment, in particularly the rail bridge over Croppa Creek, underbridges and former stations.

6.7 Socio-economic

The project will have positive local and regional economic benefits through employment generation, training opportunities, as well as increased trade for local businesses. The external workforce may have an impact on accommodation and housing supply, however this impact will be manageable due to existing supply and the Proponent's commitments to implementing a housing and accommodation plan and employing local workers.

6.7.1 Issue

Construction of the project has the potential to impact both positively and detrimentally on the local community through:

- local employment and increased demand at local businesses;
- increased demand for accommodation;
- inflow of an external workforce;
- property acquisition; and
- perceptions of community safety and health impacts.

Amenity impacts related to construction and operation (e.g. noise, dust, access and visual impacts) have been considered in the previous sections.

6.7.2 Submissions

Community Submissions

Public submissions raised concerns about general amenity and property value due to nuisance impacts (noise, air quality, traffic), and impacts to recreation at Croppa Creek Bowling Club from severance and noise.

Government Agency and Council Submissions

Moree Plains Shire Council raised severance, impacts on emergency services access, community cohesion, corridor security, property acquisition and amenity impacts.

Narrabri Shire Council raised consultation with landowners about property impacts and with Council about accommodation availability.

6.7.3 Department's Consideration

External workforce may have social impacts and affect the local housing market

A potential socio-economic impact during construction is the potential inflow of an external workforce and the associated impacts, such as demographic changes to community, access to and cost of accommodation and services, anti-social behaviour, transport of workers, and lack of locally sourced employment. Accommodation of a non-resident workforce has the potential to increase demand and competition for accommodation in affected areas, with related impacts to affordability.

The Department accepts that there are various accommodation options that the Proponent could employ such as temporary housing, hotel or motel accommodation, or accommodation in established workers camps. With an estimated 500 workers required during construction the overall demand is not determined to be significant in the context of the available accommodation in Narrabri and Moree, although it could impact on local rental availability. The Department supports the Proponent's commitment to implement a housing and accommodation plan. This would include consultation with local accommodation providers and councils regarding the availability of accommodation, and the need to maintain availability for non-workforce accommodation. The Department considers that this measure would minimise the impact to local housing affordability and availability within the area.

The Proponent has committed, where practical, to a workforce of workers sourced locally with potential opportunities for training local employees, including Indigenous participation, as well as using local suppliers for procurement of goods and services. This would reduce demand on infrastructure, services, facilities, and logistics, and extend the project's economic benefits into local economies.

Notwithstanding the impacts, the Department acknowledges the positive local and regional economic benefits of the proposal including employment generation, training opportunities and the development of new skills, as well as increased trade for local businesses (accommodation, food services, retail trade, finance, health care, recreation services etc) and potential of reduced freight road traffic along regional and local roads. The residual impacts can be managed and would not, subject to conditions and the Proponent's commitments, result in any long term adverse or irreversible effects.

Property acquisition is required

Most of the land to be impacted by the project is contained within the existing rail corridor and owned by the Proponent or other public agencies, however the construction and operation of the project will require acquisition. Anxiety, stress, and other effects on social wellbeing may arise during the acquisition process.

Construction of the project would partially affect 16 lots across 14 properties in private ownership, as well as partially affect 13 lots of Government land. The Proponent has committed to undertaking all acquisitions/adjustments in consultation with landowners and in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*. The Department is satisfied with these measures.

The Department acknowledges the issue raised in submissions received from the public regarding the risk to property values from the proposed project. However, it is an established principle that the impact of a proposal on surrounding property value is not a planning consideration (*Trinvass Pty Ltd and Anor v Council of the City of Sydney* [2015] NSWLEC 151 [89]).

6.8 Other Issues

Issue	Consideration
Air quality	<p><i>Dust impacts during construction can be managed</i></p> <p>Construction of the project will potentially cause air quality impacts to neighbouring properties from the generation of airborne particulate matter and the dispersion of dust.</p> <p>Most of the project traverses sparsely settled rural land, with only part of the project located within or near towns and residences. Given the project's geography, approximately 243 sensitive receivers are located within 200 metres of the project area.</p> <p>The Proponent undertook a potential worst-case 24-hour particulate assessment of PM¹⁰ concentrations in various scenarios. The results of this assessment indicate that air quality and dust impacts from construction would unlikely extend further than 150 metres from the project area in the worst-case scenarios.</p> <p>The Proponent has committed to document air quality management and mitigation responses in the CEMP. The Department supports the Proponent's commitment to prepare and implement such a sub-plan during construction and has reinforced this in the recommended conditions of approval.</p> <p><i>There are minimal operational air quality impacts</i></p> <p>The Proponent has committed to complying with the operational air quality management requirements specified in its Environment Protection Licence (EPL) from the EPA and maintain and operate maintenance service vehicles and equipment in accordance with manufacturer's specifications.</p> <p>The Department considers that the operational air quality impacts associated with the project can be managed within the EPL and by the Proponent's environmental mitigation commitments and the recommended conditions.</p>
Climate change and sustainability	<p><i>The project will be delivered to respond to climate change and have an 'excellent' sustainability rating</i></p> <p>The Proponent has outlined actions to mitigate the potential impacts of climate change, including appropriately designed drainage and embankments to deal with high rainfall and flooding events, and consideration of the heat tolerances of track to minimise buckling during extreme heat events. The Proponent will develop an emergency response sub-plan as part</p>

Issue	Consideration
	<p>of the CEMP. The plan would include measures to mitigate potential impacts from emergency situations during construction, such as bushfires and extreme weather.</p> <p>The Department supports the Proponent's commitment to addressing climate change impacts and has reinforced this commitment in the recommended conditions of approval. The Department also recommends a condition requiring the project meets a minimum 'excellent' rating for both 'Design' and 'As built', under the Infrastructure Sustainability Council of Australia infrastructure rating tool.</p>
Contamination	<p><i>Contamination risks are typical for this type of project and can be managed safely through established processes</i></p> <p>The Proponent's targeted site investigations of registered contaminated sites concluded that the potential for contamination to be encountered during construction is minimal. In addition, the Proponent has identified potentially contaminating land uses along and in the vicinity of the project site. Most of these sites comprise service stations and parts of the rail corridor itself.</p> <p>This type of contamination risk is typical of an existing rail corridor. Due to the potential for further discovery of contaminated soils across the project area during excavation works, the Department has recommended a Site Contamination Assessment Report be prepared where contaminated land is identified. The Department has also recommended that should remediation be required a Site Audit Statement and Site Audit Report must be prepared by an EPA Accredited Site Auditor.</p> <p>One test sample site (located in the rail corridor directly south of the crossing with Gurley Creek) recorded the presence of chrysotile asbestos in gravel fill material found beneath the ballast, at depths between 0.4 and 1.6 metres below top of rail. Soils in the vicinity of this location would be classified as Special Waste (Asbestos). Based on the potential presence of asbestos there is the risk of exposure for site workers and the nearby community during track formation works. Notwithstanding, the risks associated with asbestos overall are likely to be low subject to mitigation measures and recommended conditions.</p>
Spoil and waste management	<p><i>Spoil and waste impacts can be efficiently managed</i></p> <p>The Proponent advises that there is a deficit of spoil material for reconstruction of the track formation, and as such, there is unlikely to be excess spoil material. In local instances where excess spoil does eventuate, it would be incorporated into the edges of the formation, rail maintenance access roads and batter slopes.</p> <p>The Department agrees with the outlined approach and the Proponent's preference for clean spoil to be utilised within the rail corridor prior to creating spoil mounds. The Department recognises potential impacts associated with the formation and placement of spoil mounds, including the degree of uncertainty regarding their size, location, visual impact and potential effects on biodiversity, heritage, overland flow paths and flooding. As such, the Department has set locational criteria and recommended conditions to ensure that any excess spoil is managed appropriately and would not contribute to any impacts beyond those considered as part of this project.</p>

Issue	Consideration
	<p>Waste management for the project will follow the waste hierarchy approach of avoidance and re-use before consideration of waste disposal in accordance with the <i>Waste Avoidance and Resource Recovery Act 2001</i> and <i>Protection of the Environment Operations Act 1997</i>.</p> <p>The Department considers the impact of waste management activities to be minor and have a minimal risk to the environment or human health and has recommended conditions of approval to manage impacts. These include standard CSSI waste conditions including the classification and lawful disposal of wastes.</p>
Soils	<p><i>Soils will be managed to limit erosion during construction and operation</i></p> <p>The Proponent's assessment indicates that it is unlikely that saline or acid sulfate soils would be encountered during construction or operation of the project. Notwithstanding, the Proponent has committed to prepare a soil and water management sub-plan as part of the CEMP which will detail measures to be implemented to minimise potential soil impacts including erosion control practices and stockpiling and topsoil management.</p> <p>Erosion impacts, including impacts on black soils in the region, have also been considered as part of the flooding and hydrology assessment (Section 6.2).</p>



7. Evaluation

The Department has reviewed the EIS, SPIR and RtS, and assessed the key issues arising from the construction and operation of the proposal. This has been undertaken with advice from relevant government agencies and councils, and in consideration of key strategic government policies and plans. The Department considered all relevant matters, objects of the EP&A Act and principles of ecological sustainable development. The proposal is in the public interest by providing development opportunities for regional NSW, improving freight rail capacity and reliability and encouraging a freight mode shift from road to rail. It provides benefits for rural and regional NSW by providing enabling infrastructure for economic development. The Department considers the proposal should be approved subject to conditions.

The proposal is consistent with *2020 Infrastructure Priority List of Infrastructure Australia*, *NSW State Infrastructure Strategy 2018-2038*, *Future Transport Strategy 2056*, *Regional NSW Service and Infrastructure Plan* and *NSW Freight and Ports Plan 2018-2023* as it would:

- improve intercity and intracity general and freight transport connections;
- improve freight travel times and increased network capacity;
- increase access for freight across the rail network, as well as ensure safe, efficient and sustainable freight access to places; and
- provide economic development opportunity in the region.

Key issues associated with the proposal are related to:

- biodiversity,
- flooding and hydrology,
- noise and vibration,
- heritage, and
- socio-economic impacts.

The Proponent has identified a range of environmental management measures which it has committed to applying. Residual impacts are acceptable when managed through recommended conditions and the Proponent's commitments, such that there is no long term and irreversible impact. Based on its assessment, the Department recommends conditions aimed at improving the level of environmental management and reducing potential impacts. Subject to conditions, the proposal would ensure that impacts to native vegetation and threatened species habitat is minimised and offset in accordance with applicable legislation. The proposal limits changes to existing watercourses, and additional flooding impacts are limited under the Department's stringent conditions. The impact of construction and operational noise would be effectively managed through controls on construction hours and requirements for operational noise treatment.



8. Recommendation

It is recommended that the Minister for Planning and Public Spaces:

- **considers** the findings and recommendations of this report; and
- **accepts and adopts** the findings and recommendations in this report as the reasons for making the decision to approve the application;
- **considers** any advice provided by the Minister having portfolio responsibility for the project;
- **agrees** with the key reasons for approval listed in the notice of decision;
- **grants approval** for the application in respect of SSI 7474 as amended, subject to the conditions in the attached project approval; and
- **signs** the attached project approval and recommended conditions of approval.

Recommended by:

Alexander Scott

Team Leader

Transport Assessments

Recommended by:

Glenn Snow

Director

Transport Assessments



9. Determination

The recommendation is adopted / ~~not adopted~~ by:

The Hon. Rob Stokes MP

Minister for Planning and Public Spaces

18th August, 2020.



Appendices

Appendix A – List of Documents

1. Narrabri to North Star Project Environmental Impact Statement – Volumes 1 to 7 – dated 3 November 2017 (EIS)
2. Narrabri to North Star Project Submissions and Preferred Infrastructure Report – dated 11 December 2019 (SPIR)
3. Narrabri to North Star Project Response to Submissions Report – dated 26 May 2020 (RtS)

Appendix B – Environmental Impact Statement

<https://www.planningportal.nsw.gov.au/major-projects/project/10466>

Appendix C – Submissions

<https://www.planningportal.nsw.gov.au/major-projects/project/10466>

Appendix D – Submissions and Preferred Infrastructure Report

<https://www.planningportal.nsw.gov.au/major-projects/project/10466>

Appendix E – Response to Submissions

<https://www.planningportal.nsw.gov.au/major-projects/project/10466>

Appendix F – EESG Biodiversity Assessment

Assessment of EPBC Act listed threatened species and communities using the NSW Framework for Biodiversity Assessment

1. Identifying MNES

-
- (a) **Confirm** whether all the EPBC Act-listed threatened species and communities that occur on the project site, or in the vicinity are identified in the EIS. Note which species and/or communities have not been identified.

The EPBC Act-listed threatened species and communities that occur on the project site for the Inland Rail Narrabri to North Star Phase 1 project or in the vicinity as generated from the Environmental Reporting Tool (ERT) have been identified in the EIS (Table 4.2, Technical Report 4 in the EIS). An assessment of the likelihood of each entity occurring has been undertaken, and a decision as to whether an assessment of significance is required has been made.

The two entities listed in the referral documentation that are likely to be significantly impacted have been identified in the EIS:

- Natural Grassland on Basalt and Fine-textured Alluvial Plains of Northern New South Wales and Southern Queensland
- Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT

Species considered by DAWE that are possibly at risk of being impacted are:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Regent Honeyeater (*Anthochaera phrygia*)
- Squatter Pigeon (southern) (*Geophaps scripta scripta*)
- Painted Honeyeater (*Grantiella picta*)
- Swift Parrot (*Lathamus discolor*)
- Superb Parrot (*Polytelis swainsonii*)
- Murray Cod (*Maccullochella peelii*)
- Pilliga Mouse (*Maccullochella peelii*)
- *Androcalva procumbens*
- Ooline (*Cadellia pentastylis*)
- Bluegrass (*Dichanthium setosum*)
- *Tylophora linearis*
- Five-clawed Worm-skink, Long-legged Worm-skink (*Anomalopus mackayi*)

- Pink-tailed Worm-lizard, Pink-tailed Legless Lizard (*Aprasia parapulchella*)
- Border Think-tailed Gecko, Granite Belt Thick-tailed Gecko (*Uvidicolus sphyrurus*)

(b) **Comment** on whether the Framework for Biodiversity Assessment (FBA) has been applied to all EPBC Act-listed threatened species and communities that occur on the project site or in the vicinity.

All entities that were identified as requiring an assessment of significance have been assessed. Impacts on one ecological community and one species likely to be significantly impacted were assessed and credit liabilities were determined.

Ecosystem credit obligations have been identified for three ecological communities that have been recorded in the project site - Brigalow (*Acacia harpophylla* dominant and co-dominant), Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions, and Weeping Myall Woodlands. A species credit obligation has been identified for Belson's panic which has also been recorded in the project site. None of these entities are considered to be significantly impacted by the proposed development.

During the review of the EIS and Biodiversity Assessment Report (BAR), BCD was concerned that the delineation of plant community types (PCTs) presented in the vegetation mapping, and subsequent areas of disturbance of each PCT did not reflect the plot/transect data, photographs and/or rapid assessment information. Liaison between BCD and the proponent, and review of field notes and different mapping products resulted in additional areas of impacts to PCTs and the koala being identified and discussed in the *Addendum to the Inland Rail – Narrabri to North Star Biodiversity Assessment Report – Final October 2018*.

In December 2019, the Submissions and Preferred Infrastructure Report (SPIR) was placed on exhibition. The SPIR included an additional area of 1,053 hectares, primarily occurring as a widening of the railway corridor. No field assessment was undertaken for the additional footprint.

In May 2020, the Response to Submissions document was lodged, which included a further addendum to the BAR. The addendum described the rapid assessment fieldwork that was completed in February and March 2020 to validate the desktop assessment completed for the SPIR. Updates to impacts on MNES have occurred.

The Biodiversity Offset Strategy (BOS) submitted with the EIS does not describe how the ecosystem and species credit obligations will be fulfilled. The minimum information requirements for the BOS (Stage 3 and Table 22 of the FBA) have not been fulfilled. However, the credit retirement options in the draft conditions of approval mean that preparing a BOS is unnecessary. The proponent is proposing to meet the credit obligation through the establishment of biodiversity stewardship sites. These require the preparation of Biodiversity Stewardship Site Assessment Reports (BSSARs), which contain the same information as a BOS. Any residual credit obligation is proposed to be met through purchase of existing credits or payment into the Biodiversity Conservation Fund (BCF), which are simple transactions that do not require a strategy.

-
- (c) In the circumstance where there are EPBC Act-listed species that are not addressed by the FBA (i.e. migratory species) **comment** on whether these species have been assessed in accordance with the SEARs and provide references to where the assessment information is detailed in the EIS.

Not applicable.

-
- (d) **Verify** that the proponent has expressed a statement about the potential impact i.e. likely significant, low risk of impact, not occurring, for each listed threatened species and community protected by the EPBC Act referred to in 1(a). Note which species and/or communities have not been addressed in this manner.

An assessment of whether each threatened species is likely to occur in the project footprint and a subsequent assessment of significance has been undertaken. As stated in 1(b) above, the area of impact to some MNES has increased following further review of ecological survey data following exhibition of the EIS, and more recently as a result of the increased project footprint exhibited in the SPIR. Whilst an update to the area of impact on MNES is included in the RTS, no updated assessment of significance has been completed. The results as reported in the EIS (section 6 of Technical Report 4) are:

- Natural Grassland on Basalt and Fine-textured Alluvial Plains of Northern New South Wales and Southern Queensland – likely to be significantly impacted as 146.7 hectares will be removed.
- Koala – the assessment of significance concludes there is unlikely to be a significant impact on an important population of the koala, despite DoEE determining that there will be a significant impact. The loss of 2.18 hectares of primary habitat and 13.44 hectares of secondary habitat is not considered to have a significant impact. Additionally, residual impacts are not predicted due to the minimisation and mitigation strategies, and offsetting of relevant plant community types (PCTs).

Entities that are possibly at risk of being significantly impacted were also assessed:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – the community was not identified on site therefore it is unlikely the proposal will have a significant impact.
- Regent Honeyeater – the species has not been recorded on site and key feed species were not recorded, therefore it is unlikely the proposal will have a significant impact.
- Squatter Pigeon – no sightings were recorded during the fauna surveys and there is a scarcity of records in NSW. It is unlikely that an important population is present, and as a result it is unlikely that a significant impact will occur.
- Painted Honeyeater – no sightings were recorded during the fauna surveys and potential habitat is considered poor. It is unlikely that there will be a significant impact on an important population.
- Swift Parrot – there are no known records within 10 kilometres of the proposal site, and important habitat does not occur in the project site, therefore it is unlikely the proposal will have a significant impact.

- Superb Parrot (*Polytelis swainsonii*) – no sightings were recorded during the fauna surveys and there are a low number of records within 10 kilometres of the project site. It is unlikely that an important population is present, and as a result it is unlikely that a significant impact will occur.
- Murray Cod – there is unlikely to be an adverse effect on the extent or quality of habitat for the species, therefore there is unlikely to be a significant impact.
- Pilliga Mouse (*Maccullochella peelii*) – 0.11 hectares of potential habitat occurs in the project site, however the species is not known to occur on site. All records occur in the Pilliga scrub area south of the proposal site. An important population of this species is unlikely to occur, and therefore a significant impact on an important population is unlikely to occur.
- Bluegrass – the species was not recorded on site despite targeted flora surveys, therefore it is unlikely that there will be a significant impact.
- *Tylophora linearis* – a population is unlikely to occur on site therefore it is unlikely there will be a significant impact.
- Five-clawed Worm-skink – no individuals were recorded despite targeted surveys being undertaken. It is unlikely that an important population is present, and as a result it is unlikely that a significant impact will occur.
- Pink-tailed Worm-lizard - no individuals were recorded despite targeted surveys, and no records occur within 10 kilometres of the project site. It is unlikely that an important population is present, and as a result it is unlikely that a significant impact will occur.
- Border Thicket-tailed Gecko - no individuals were recorded despite targeted surveys being undertaken, and there is an absence of preferred habitat on site. It is unlikely that an important population is present, and as a result it is unlikely that a significant impact will occur.

Neither *Androcalva procumbens* or ooline were considered to require a detailed assessment of significance.

Entities that are considered unlikely to be significantly impacted but were still assessed according to the *Significant Impact Guidelines 1.1: Matters of National Environmental Significance* include:

- Brigalow (*Acacia harpophylla* dominant and co-dominant) – 0.6 hectares will be removed; this small area of impact is unlikely to result in a significant impact.
- Coolibah – Black Box Woodland of the Darling Riverine Plains and the Brigalow Belt South Bioregions – 1.19 hectares will be removed; this small area of impact is unlikely to result in a significant impact.
- Weeping Myall Woodland – 0.43 hectares will be removed; this small area of impact is unlikely to result in a significant impact.
- Belson's panic – a small number of individuals were recorded in the project site, the site is highly disturbed, and a reasonable number of records of the species are recorded outside of the proposal site. Therefore these individuals are not considered to form part of an important

population. As a result it is unlikely there will be a significant impact on an important population of the species.

- South-eastern long-eared bat (*Nyctophilus corbeni*) – this species was not recorded on site, there is a scarcity of local records, and a small area of habitat is present on site. Therefore, it is unlikely that a significant impact on an important population will occur.
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – one individual was recorded on the project site, however there are no camp sites or breeding habitat present for the species. Any potentially occurring population of grey-headed flying foxes within the proposal site would not be considered an important population, therefore it is unlikely that there would be a significant impact.

(e) **Identify** where further information from the proponent is critical to the assessment of MNES particularly in relation to mapping Table 1 (A), analysis of impacts Table 1 (F) and Table 2 (F), avoidance, mitigation and offsetting, and 6.

The EIS did not assess the biodiversity impacts of “temporary” disturbance resulting from laydown areas, temporary access tracks and vehicle parking areas. Following consultation with BCD these impacts were accounted for and described in the *Addendum to the Inland Rail – Narrabri to North Star Biodiversity Assessment Report – Final October 2018*. In addition, review of ecological survey data and review of the subsequent vegetation mapping resulted in updated impacts to PCTs (including MNES) being identified. Koala species credit polygons were also updated as a result of the updated impacts to PCTs.

An additional 1,053 hectares was added to the proposed development footprint as exhibited in the project's SPIR in December 2019. No field validation of the updated vegetation mapping occurred. A conservative approach was used with regards to MNES impacted by the development, with entire additional areas of relevant PCTs considered to conform to the EPBC Act-listed ecological communities. Rapid field assessments were completed in February-March 2020 to validate these assumptions. Rain in the area before and during the field assessments resulted in a good response from native grasses, and targeted flora surveys identified relevant MNES. The credit obligation presented in the SPIR was updated in the RTS and generally resulted in a lower credit obligation as impacts were based on data rather than assumptions of presence.

The BOS does not meet the minimum information requirements of the FBA (see Table 22 of the FBA). However, the credit retirement options in the draft conditions of approval mean that preparing a BOS is unnecessary as the BSSARs developed for the land-based offsets will contain the same information as the BOS. Retirement of residual credits through purchase of existing credits or payment into the BCF do not need to be supported by a strategy.

2. Assessment of the relevant impacts

All EPBC Act-listed species and/or communities that the Commonwealth consider would be significantly impacted (as noted in the referral documentation) should be assessed and offset. These are referred to as relevant impacts

(a) **Verify** [by ticking the following boxes]:

- ✓ the nature and extent of all the relevant impacts has been described
- ✓ measures to avoid and mitigate have been described
- ✗ an appropriate offset for any residual adverse significant impact has been determined.

Measures to avoid and mitigate have been described in section 5.0 of Technical Report 4 of the EIS. The biodiversity offset obligation has been updated for the impacts identified in the SPIR. Further avoidance is likely to occur during detailed design of the project.

Whilst the offset obligation has been calculated, the EIS, SPIR and RTS do not articulate how the obligation will be met through the BOS. The proponent has committed to securing land-based offsets, which will require the preparation of BSSARs which contain the same information as a BOS. Retirement of residual credits through purchase of existing credits or payment into the BCF do not need to be supported by a strategy.

(b) **Note** if information in relation to any of these boxes has not been provided for any relevant EPBC Act-listed species and communities.

(c) A BOS has not been submitted with the EIS or subsequent documentation. EPBC Act-listed entities must be offset in accordance with the *Biodiversity Conservation Act 2016*, with offsets being on a like-for-like basis. There may be listed threatened species and communities for which the proponent will claim that the impact will be **not** significant in accordance with the EPBC Act Significant Impact Guidelines. Please **provide** advice for cases where OEI disagrees with this finding.

The proposed footprint has expanded by 1,053 hectares since the EIS was prepared. Whilst the area of impact has been updated, the proponent has not updated the assessment of significance for MNES.

DoEE considered that the koala was likely to be significantly impacted, however in the EIS the proponent concluded that the impact was not likely to be significant. The area of impact on the koala as described in the RTS is now 175.25 hectares. BCD considers that removal of koala use trees in an already fragmented landscape will further isolate the availability of habitat to individuals.

In addition, the impact on Belson's panicle has increased from 73 individuals to 255 individuals, with an assumed presence of 99.65 hectares in the areas that could not be accessed for targeted surveys. An impact of this size is considered to be significant.

(d) Provide references to where specific lists or tables are detailed in the EIS i.e. List of EPBC Act-listed EECs Appendix J Table 4 pg 65

EIS – Technical Report 2 - Biodiversity Assessment Report

- Predicted Ecosystem-credit Species – Table 3.6 page 73
- Predicted Species-credit Species – Table 3.7 page 81

- Impacts on Native Vegetation that Require Further Consideration as per the SEARs and Recorded in the Development Site – Table 5.4 page 133

EIS - Technical Report 4 – Commonwealth Matters Assessment

- Summary of Targeted Surveys Completed for EPBC Act-listed Threatened Species listed Predicted to Occur in the Proposal site – Table 3.1 page 16
- Direct and Permanent Impacts of the Proposal on Ecological Communities and Values – Table 4.1 page 31
- Preliminary Assessment of the Proposal on MNES Recorded or with Potential to Occur within the Proposal Site – Table 4.2 page 38
- Koala Habitat Quality in the Proposal Site – Table 4.3 page 62
- Summary of Technical Data and Other Information Used or Needed to Make a Detailed Assessment of the Relevant Impacts – Section 4.2.2 page 64
- Avoidance Measures – Table 5.1 page 70
- Proposed Management Measures for Subject Species and Ecological Communities – Table 5.2 page 72
- Summary of the Impacts and Offsets of the Proposal on Impacted MNES, in accordance with the NSW– FBA - Table 6.1 page 98.

Table 1 Impact Summary Relevant EPBC Act –listed Ecological Communities (refer to section 3)

A	B	C	D	E		F	G
EPBC Act -listed EEC	Y/N	PCTs	Y/N/ comment	Ha	Credits	Comment	Relevant page numbers in the EIS
Natural Grassland on Basalt and Fine-textured Alluvial Plains of Northern New South Wales and Southern Queensland	Y	PCT 52 – Queensland Bluegrass +/- Mitchell Grass grassland on cracking clay floodplains and alluvial plains mainly the northern-eastern Darling Riverine Plains Bioregion	Y	432.07	20,102	The area of impact in the EIS was 146.7 ha requiring 11,046 credits. This area has been updated in the RTS to 432.07 ha requiring 20,102 credits, as a result of rapid assessment fieldwork that was completed in February and March 2020.	Technical Report 2 (BAR) – pages 19, 59, 69, 124, 129, 133-139, 159; Appendix D - pages 12-14 Technical Report 4 EIS – pages 31, 39, 60, 94 98; Appendix B – pages 3-4.

(A) **List** the relevant EPBC Act listed ecological communities that will be significantly impacted in accordance with the referral documentation.

(B) **Verify** that there is evidence in the EIS that listed EEC and species habitat has been mapped in accordance with relevant listing guidelines (Yes/No).

Proponents are required by the SEARs to ensure that EPBC-listed communities are mapped in accordance with EPBC Act listing criteria. It is important that any derived native grassland components of an EPBC listed EEC are included in the mapping of native vegetation extent.

(C) **List** the Plant Community Types (PCTs) associated with the ecological communities in accordance with Chapter 5 of the FBA.

(D) **Confirm** that the identification of PCTs has been correct (Yes/No) and comment if not correct.

(E) **Record** the area of impact (ha) and credits required.

(F) **Comment** on the analysis of the impacts in relation to the nature and extent of the impact and whether or not the EIS includes an analysis of the direct and indirect impacts to the EEC. Note whether further information might be required.

(G) **Cite** relevant page numbers for details provided the EIS and Appendices for each EEC.

Table 2 Impact Summary Relevant EPBC Act –listed Species (refer to Section 4)

A	B	C	D	E		F	G
Threatened species (listed under the EPBC Act)	Credit Type (SC/EC)	Record PCTs associated with ecosystem credits	Y/N/ Comment	Ha (total species habitat)	Credits (total species habitat)	Comment	Relevant page numbers in the EIS and Appendices
Koala	SC		Y	175.25	4,556	The area of impact in the EIS was 62.77 ha requiring 1,632 credits. The Koala Habitat Assessment Tool considered that 2.18 ha of primary habitat and 13.44 ha of secondary habitat will be removed. This area has been updated in the RTS to 175.25 ha requiring 4,556 credits, as a result of rapid assessment fieldwork that was completed in February and March 2020.	Technical Report 2 (BAR) EIS - pages 38, 93, 100-102, 159 Technical Report 4 EIS – pages 33, 58, 60-62, 96-97; Appendix B - 36-42

(A) **List** the relevant threatened species that will be significantly impacted in accordance with the referral documentation.

(B) **Record** whether the relevant threatened species is classified as “species credit species” of ecosystem credit species for the purposes of the FBA.

(C) **List** the PCTs associated with the ecosystem credit species.

(D) **Verify** that the habitat polygons for MNES have been mapped appropriately representing the foraging and/or breeding habitat for the species that will be impacted by the development.

(E) **Record** the area of impact (ha) and credits required. For impacts associated with ecosystem credit species identify the total credit requirements associated with the cleared PCTs identified as habitat for the species.

(F) **Comment** on the adequacy of the analysis of the impacts in relation to the nature and extent of the impact and whether or not the EIS includes an analysis of the direct and indirect impacts to the species. Note if further information is required.

(G) **Cite** relevant page numbers for details provided in the EIS and Appendices for each threatened species.

3. Avoid, mitigate and offset

(a) Comment on whether or not the EIS identifies measures to avoid and minimise impacts on the relevant EPBC Act-listed threatened species and communities. Section 8 of the FBA requires that proponents detail these efforts and commitments in the EIS. Identify gaps in the discussion on measures to avoid and minimise impacts on Commonwealth matters. Provide references to sections and page numbers in the EIS.

Section 4 of the BAR, section 5 of Technical Report 4 and section 10.4.3 of the main report detail the measures that have been implemented to avoid and minimise impacts.

Location of works are constrained by the existing rail corridor, however where possible works such as placement of site offices and storage bunds will be located in primarily disturbed or exotic landscapes. Pre-clearance surveys and minimising the interaction with microbats are proposed. Further avoidance of impacts to MNES may occur following completion of the detailed design. Weed control, sediment and erosion control, and fencing native vegetation are the main mitigation measures proposed.

References:

- Mitigation and Management - Section 10.4.1 page 10-28 – Main Report, EIS
- Avoidance and Minimisation of Impacts - Section 4 pages 104-110 – Technical Report 2 Biodiversity Assessment Report
- Avoidance, Mitigation and Offsetting - Section 5.0 pages 69-91 – Technical Report 4 Commonwealth Matters Assessment, EIS.

(b) Comment on the adequacy and feasibility of measures to avoid and minimise impacts. Identify inadequacies where further efforts could be made to avoid and minimise impacts on Commonwealth matters. Provide references to sections and page numbers in the EIS that discuss avoidance and mitigation measures relevant to EPBC Act-listed species and communities.

See discussion above.

Most of the impacts associated with the proposed development will be limited to the existing rail corridor, or directly adjacent to the corridor. The ability to avoid further impacts to MNES is constrained by the location of the railway corridor. However, where flexibility exists, impacts will be prioritised in areas of previously disturbed land rather than native vegetation. It is expected that impacts to PCTs can be reduced during the detailed design phase.

BCD is satisfied with the avoidance and mitigation measures proposed.

EIS references are the same as above.

4. Offsetting

(a) Verify [by ticking the following boxes] that the offsets proposed to address impacts to EPBC-listed threatened species and communities are in accordance with the requirements under the EPBC Act.

✓ An appropriate offset for any residual adverse significant impact has been determined.

✗ Proposed offsets for EECs provide a like for like outcome i.e. proponents have identified PCTs attributed to the specific threatened ecological community being impacted

✗ Proposed offsets have been determined using the FBA

If offsets have not been determined in accordance with the FBA, Planning is required to discuss the proposed approach with the Commonwealth as soon as possible.

The proponent has submitted a draft BOS which details the land-based offsets that are proposed to meet the credit obligation. If the current proposal is finalised, the EEC offsets will have a like-for-like outcome.

The biodiversity credit liability has been calculated using the FBA and the BioBanking Credit Calculator. Minimum information requirements for the BOS (Table 22 of the FBA) have not been fulfilled, however the preparation of BSSARs for the land-based offsets will contain the same information as a BOS. Retirement of residual credits through purchase of existing credits or payment into the BCF do not need to be supported by a strategy.

The proponent will be required to conform to the relevant offset rules for EPBC Act-listed entities.

(b) Comment on whether the information and data relied upon for the assessment have been appropriately referenced in the EIS. Comment on the validity of the sources of information and robustness of the evidence.

The information and data used in the assessment has been appropriately referenced, and the sources of information are valid.

Within the EIS “temporary” impacts to biodiversity were not appropriately assessed or offset. This was addressed within the *Addendum to the Inland Rail – Narrabri to North Star Biodiversity Assessment Report – Final October 2018*. No field work was undertaken to accurately identify the impact to biodiversity as a result of the amended footprint presented in the SPIR. However, rapid assessment fieldwork was completed in February and March 2020 to ensure impacts identified in the desktop review were validated with field data. The updated impacts are presented in the RTS.

Table 3 Summary of Offset Requirements

A	B	C	D	E	F
Threatened species or EEC (listed under the EPBC Act)	Credits required as calculated by the FBA	Credits generated from offsets in remnant vegetation	Credits generated from offsets proposed by other means	Comment on the proposed offsets.	Relevant page numbers in the EIS and Appendices
Natural Grassland on Basalt and Fine-textured Alluvial Plains of Northern New South Wales and Southern Queensland	20,102	20,102	0	As per the EIS, the proponent intends to secure land-based offsets to fulfil the biodiversity credit liability for the two EPBC Act-listed entities. However, no information has been provided in a BOS detailing how the credit liability will be met through relevant offset properties. BCD is satisfied that the development consent will contain relevant conditions stating the biodiversity obligation to be retired, the options available to retire the credits, and the requirement that credits relating to MNES must be retired in a like-for- like manner.	EIS Main Report – pages 10-23 to 10-24 Technical Report 2 BAR – pages 102, 122, 124, 129-131, 159-160, 162-163 Technical Report 4 EIS – pages 91-93, 98-101
Koala	4,556	4,556	0		

- (A) **List** the relevant threatened species or ecological community included in the proposed offset package (these are the listed species and communities that will be significantly impacted in accordance with the *EPBC Act Significant Impact Guidelines 1.1*). Identify any relevant species or ecological communities which have not been included in the proposed offset package.
- (B) **List** the total credit requirement identified by the FBA for impacted listed threatened species and ecological community. For EECs and ecosystem credit species this is the sum of the credits generated by PCTs associated.
- (C) **Identify** the total number of required credits which are proposed to be retired through conserving and managing remnant / mature vegetation.
- (D) **Identify** the number of credits proposed to be met through other methods allowable under the FBA, such as rehabilitation of impacted areas or regrowth vegetation.
- (E) **Comment** on the adequacy of the proposed offset in meeting requirements of the FBA and the EPBC Act. In particular is there a reasonable argument for a shortfall in credits required for MNES and/or non-compliance with like-for like? Are the offsets proposed by means other than protection of remnant vegetation adequate?
- (F) **Reference** the relevant page numbers from the EIS and Appendices for each threatened species and community.

Appendix G – 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 (the Minister), in deciding whether to approve a proposal under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Department considers that all threatened species and communities protected under Part 3 of the EPBC Act have been adequately assessed and documented in the Environmental Impact Statement (EIS) and the Submissions Preferred Infrastructure Report (SPIR). This assessment has been prepared based on the information contained in Chapter 10 - Biodiversity; Appendix L – Biodiversity Offset Strategy; Technical Paper 2: Biodiversity Assessment Report; Technical Paper 3 – Aquatic Ecology Assessment and Technical Report 4 – Commonwealth Matters Assessment, in the EIS, Chapter 12.1 – Biodiversity impacts; Chapter 13.1 – Mitigation measures; Appendix F – July 2020 Addendum to the Narrabri to North Star Biodiversity Assessment Report; and Appendix G – Biodiversity Briefing Note, in the SPIR, any supplementary information provided during the assessment process and advice provided by the Department's Environment, Energy and Science Group (EESG).

This Appendix is supplementary to and should be read in conjunction with the assessment included in **Section 6.2** of this 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).

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 **Section M.4** of this report.

In accordance with section 139 EPBC Act, in deciding whether or not to approve, for the purposes of section 18 or section 18A 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 Addendum) 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 and 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) 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 Convention have been taken into consideration. The recommendations are not inconsistent with the Convention which has the general aims of conservation of biodiversity.

The *Convention on International Trade in Endangered Species of Wild Flora and Faunas* (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 Advice for: Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland TEC; Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC; Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions TEC; Weeping Myall Woodlands TEC; Belson's panic (*Homopholis belsonii*); and the Koala (*Phascolarctos cinereus*), but no Recovery Plans for these communities and species.

- **Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland**

The Conservation Advice for this critically endangered ecological community (CEEC) was approved on 15 December 2008. The geographic distribution of this community (Darling Downs in Queensland to Dubbo in NSW and incorporates the Liverpool and Moree Plains) has undergone a very severe decline and is currently restricted to small remnants that face continuing threats. These threats include heavy grazing, cropping, mining, weeds and dryland salinity. The project will remove approximately 432.07 hectares of this community. This is likely to have a significant impact on the ecological community and ecosystem credits will be obtained to offset these impacts. The Department considers that avoidance of

the ecological community in the detailed design and addressing residual impacts through the proposed offsets, would address the loss of the CEEC.

- **Brigalow (*Acacia harpophylla* dominant and co-dominant)**

The Conservation Advice for this endangered ecological community was approved on 17 December 2013. The Brigalow ecological community occurs within Queensland and NSW, in an area west of the Great Dividing Range from Townsville in the north to Narrabri in the south and west to Bourke on the Darling River and Blackall in Central Western Qld. The threats to this community, in order of significance, include clearing, fire, weeds, feral animals and inappropriate grazing. Climate change is noted as an emerging threat that needs consideration in management. The project will directly impact the ecological community by removing 16.13 hectares of vegetation. The BAR considers the proposal is unlikely to have a significant impact on this community, however the Department considers that this impact is significant. The Proponent has committed to reduce impacts through the detailed design and provide ecosystem offsets to compensate these residual impacts.

- **Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions**

The Conservation Advice for this endangered ecological community was approved on 10 February 2011. This floodplain ecological community is situated within the upper reaches of the Murray-Darling Basin and southern part of the Fitzroy River system in Northern NSW and Southern Queensland. The landscape within which the ecological community occurs is subject to a matrix of landuses, notably horticulture, grazing and cropping. Some of these landuses are supported by irrigation that draws water from the rivers and wetlands in the region. The key threats impacting upon the Coolibah – Black Box Woodlands ecological community are clearing and fragmentation; changes to water flows and patterns; inappropriate grazing regimes; invasion by exotic species (especially *Lippia* (*Phyla canescens*) and African Boxthorn (*Lycium ferocissimum*)); and the low level of protection in reserves. Many of the threats to the ecological community also have adverse impacts on associated threatened species. Approximately 1.74 hectares will be removed as a result of the proposal, which is unlikely to significantly impact this community. This vegetation will be offset in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*.

- **Weeping Myall Woodlands**

The Conservation Advice for this ecological community was approved on 17 December 2008. The endangered ecological community occurs on the inland alluvial plains west of the Great Dividing Range in NSW and Queensland. The main threats to the ecological community are clearing and ongoing degradation. Weeping Myall Woodland occurs on highly fertile and arable soils which is under significant pressure from clearing for cropping. Other threats include overgrazing, weed invasion and herbivory by caterpillars of the Bag-shelter Moth. The BAR Addendum has not updated the significance of the increase in clearing of this community (from 0.43 ha to 9.16 ha). The Department considers that the increased impacts to the TEC is a significant impact. The approved conservation advice recommends; weed management and avoidance of the use of fertilisers and herbicides in or near remnants. The

recommended conditions require the Proponent to manage weeds as part of the Construction Biodiversity Management Plan and provide ecosystem offsets in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*. The Department is satisfied that the avoidance of impact during detailed design and the provision of ecosystem credits will offset impacts to the ecological community.

- **Belson's panic (*Homopholis belsonii*)**

The Conservation Advice for this vulnerable species was approved on 1 October 2008. The species is known to occur within the southern Brigalow belt, Queensland and on the north-western slopes and plains of NSW, between Wee Waa, Goondiwindi and Glen Innes. The main threats are clearing of habitat for agriculture, development or pasture improvement; overgrazing of habitat by domestic stock; invasion of habitat by introduced weeds; and clearing of habitat for mining. The proposal is likely to result in direct impacts to 255 individuals and the clearing of approximately 99.65 hectares of habitat. The Proponent has assumed the presence of this species on land where no access was available for targeted surveys. Impacts to this species would be addressed through the provision of species credits. Although the impacts to the threatened species is significant, the avoidance of impact where practicable during detailed design and the provision of species credits would address the proposal's impacts.

- **Koala (*Phascolarctos cinereus*)**

The Conservation Advice for the koala was approved on 30 April 2012 and applies to the combined population in Queensland, NSW and the ACT. The main threats to this species are loss and fragmentation of habitat, vehicle strike, disease and predation by dogs.

The Conservation Advice identified research priorities to fill gaps in the knowledge of the species and develop effective conservation management measures and priority management actions to support the recovery of the koala population. The research priorities include population monitoring and abundance estimation, landscape scale population models and gene flow and connectivity.

The recommended priority management actions include measures to address habitat loss, disturbance and modification, and animal predation. The Conservation Advice recommended the development of a recovery plan under the EPBC Act. To date no EPBC Recovery Plan has been prepared for the koala, however, there is a NSW Recovery Plan (DECC 2008) which identifies threats to koalas, efforts to conserve koalas and actions to aid the recovery of the species. The objectives of the recovery plan include the conservation of koalas in their existing habitat and rehabilitating and restoring koala habitat and populations.

The proposal would result in the clearing of 175.25 hectares of vegetation containing koala food trees and refugia habitat during periods of extreme heat. The Proponent proposes to offset direct impacts to koala habitat by the provision of species credits in accordance with the NSW Biodiversity Offsets Policy for Major Projects.

The Department considers impacts to koalas to be significant and has recommended conditions to require mitigation measures during construction to minimise impacts to koalas and require reductions in

direct impacts to koala habitat, the provision of a minimum species credit and for offset sites to be sourced from the IBRA subregion or an adjoining subregion within the IBRA region of the impact site.

Threat Abatement Plans

The Threat Abatement Plans 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 the biological effects, including lethal toxic ingestion, caused by cane toads (relevant to Brigalow (Acacia harpophylla dominant and co-dominant) TEC and Weeping Myall Woodlands TEC)**

Since the introduction of cane toads (*Bufo marinus*, now revised to *Rhinella marina*) to Australia in 1935, the ecological impact of this animal has aroused considerable concern. Cane toads use potent steroid-derived toxins as chemical defences. The active constituents of these differ from the toxins found in native frogs. The threat abatement plan (TAP) provides a national strategy to guide investment and effort by the Australian Government, jurisdictions, research organisations and non-government organisations in abating the impacts of cane toads across their known and anticipated range.

The Brigalow (Acacia harpophylla dominant and co-dominant) TEC and Weeping Myall Woodlands TEC are considered to fall within the predicted future range of cane toads. The threat of cane toads is mentioned with no further detail in the Conservation Advice for Brigalow TEC and is not identified within the Conservation Advice for Weeping Myall Woodlands TEC.

The Department considers that should a cane toad be found during construction, the measures identified in the TAP are appropriate to deal with the animal.

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 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 EPBC Act) and therefore further consideration is not required.

M.4 ADDITIONAL EPBC ACT CONSIDERATIONS

Table 1 contains the additional mandatory considerations, factors to be considered and factors to have regard under the Act, additional to those already discussed, which the Commonwealth Minister must consider in determining the proposed action.

Table 1: Additional considerations for the Commonwealth Minister under the EPBC Act

EPBC Act section	Considerations	Conclusion
<i>Mandatory considerations</i>		
136(1)(b)	Social and economic matters are discussed in Section 6.7 of the 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 rail freight network.
<i>Factors to be taken into account</i>		
3A, 391(2)	<p>Principles of ecologically sustainable development (ESD), including the precautionary principle, have been taken into account, particularly:</p> <ul style="list-style-type: none"> 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 	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 4.5 of the report addresses the proposal in regards ESD principles.

EPBC Act section	Considerations	Conclusion
	<p>relation to the controlling provisions for the project; and</p> <ul style="list-style-type: none"> mitigation measures to be implemented which minimise potential impacts of the project on biodiversity within the project area. 	
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 this report.
Factors to have regard to		
176(5)	Bioregional plans	There is no relevant bioregional plan.
Considerations on deciding on conditions		
134(4)	<p>Must consider:</p> <ul style="list-style-type: none"> information provided by the person proposing to take the action or by the designated proponent of the action; and 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. 	<p>All project related documentation is available at the Department's website www.majorprojects.planning.nsw.gov.au.</p> <p>The Department considers that the conditions at Appendix H – Recommended Biodiversity Conditions are a cost-effective means of achieving their purpose.</p>

M.5 CONCLUSIONS ON CONTROLLING PROVISIONS

Threatened species and communities (Sections 18 and 18A of the Act)

For the reasons set out in **Section 6.1** and this Appendix, the Department recommends that the impacts of the action on threatened species and communities will be acceptable, subject to the implementation of the avoidance and mitigation measures described in the EIS, *April 2020 Addendum to the Inland Rail*

Narrabri to North Star Biodiversity Assessment Report Final May 2020, and the requirements of the recommended conditions of approval.

M.6 OTHER PROTECTED MATTERS

The Commonwealth DAWE 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 – Recommended Biodiversity Conditions

- C4 The following **CEMP Sub-plans** must be prepared in consultation with the relevant government agencies and relevant councils identified for each CEMP Sub-plan and be consistent with the CEMP referred to in the EIS.

	Required CEMP Sub-plan	Relevant government authorities to be consulted for each CEMP Sub-plan
(a)	Traffic, transport and access	TfNSW and relevant councils
(b)	Noise and Vibration	EPA and relevant councils
(c)	Biodiversity	EES, DAWE and relevant councils
(d)	Soil and Water	Relevant councils, DPIE Water, and EES
(e)	Heritage	EES
(f)	Flood Emergency Management	SES and DPIE Water

- C9 The **Biodiversity Management Sub-plan** must include:
- (a) a weed management plan, including appropriate weed control to manage introduction and/or spread of weeds from construction areas to any retained Weeping Myall Woodlands TEC, and appropriate protocols to demonstrate compliance with the requirements of the *Biosecurity Act 2015* and *Biosecurity Regulation 2017*;
 - (b) procedures for pre-clearing surveys for threatened species to be undertaken by a suitably qualified and experienced ecologist, including survey and relocation methodologies and management/offset measures;
 - (c) measures to control cane toads, as relevant to the construction phase areas and scope in accordance with the Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads (relevant to works adjacent to retained Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC and Weeping Myall Woodlands TEC); and
 - (d) measures to protect EPBC Act listed threatened species, in particular the koala, and threatened ecological communities.

BIODIVERSITY

- E17 The Proponent must minimise impacts to plant community types and not exceed the total areas impacted as identified in **Table E1**.

Table E1: Native Vegetation Impacted

<i>Vegetation Zone and Plant Community Type (PCT) ID and Name</i>	<i>TEC under the EPBC Act (ha)</i>	<i>Total Area impacted (ha)</i>
Zone 1 - PCT27 (BR233, NA219) Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion	<i>Weeping Myall Woodlands – 9.16</i>	17.94
Zone 2 - PCT35 (BR120, NA117) Brigalow – Belah open forest / woodland on alluvial often gilgaied clay from Pilliga Scrub to Goondiwindi, Brigalow Belt South Bioregion	<i>Brigalow (Acacia harpophylla dominant and codominant) – 16.13</i>	17.31

<i>Vegetation Zone and Plant Community Type (PCT) ID and Name</i>	<i>TEC under the EPBC Act (ha)</i>	<i>Total Area impacted (ha)</i>
Zone 3 - PCT39 (BR130, NA129) Coolabah – River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion	<i>Coolabah - Black Box Woodland of the Darling Riverine Plains and the Brigalow Belt South Bioregions – 1.74</i>	1.74
Zone 4 - PCT52 (BR191, NA187) Queensland Bluegrass +/- Mitchell Grass grassland on cracking clay floodplains and alluvial plains mainly the northern-eastern Darling Riverine Plains Bioregion	<i>Natural Grasslands on Basalt and Fine-textured Alluvial Plains of Northern NSW and Southern Qld – 432.07</i>	432.07
Zone 5 - PCT56 (BR186, NA182) Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	Not listed	143.95
Zone 6 - PCT56 (BR186, NA182) Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW (Derived - Native Grasslands)	Not listed	249.85
Zone 7 - PCT71 (BR127, NA126) Carbeen – White Cypress Pine - River Red Gum - bloodwood tall woodland on sandy loam alluvial and aeolian soils in the northern Brigalow Belt South Bioregion and Darling Riverine Plains Bioregion	Not listed	0.51
Zone 8 - PCT 78 River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	Not listed	11.82
Zone 9 - PCT 135 Coobah - Western Rosewood low open tall shrubland or woodland mainly on outwash areas in the Brigalow Belt South Bioregion	Not listed	9.50
Zone 10 - PCT 413 Silver-leaved Ironbark - White Cypress Pine - box dry shrub grass woodland of the Pilliga Scrub - Warialda region, Brigalow Belt South Bioregion	Not listed	5.72
Total Area Impacted	459.10	890.41

E18 The Proponent must meet the biodiversity offset obligations for ecosystem and species credits as set out in **Tables E2** and **E3**, within two (2) years of the CSSI approval. The retirement of the biodiversity credits must be carried out in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* and can be achieved by:

- (a) acquiring and retiring “biodiversity credits” within the meaning of the *Biodiversity Conservation Act 2016*; and/or
- (b) making a payment into the Biodiversity Conservation Fund; and/or
- (c) a Biodiversity Offset Strategy prepared in consultation with EES and DAWE that provides supplementary measures.

Notes: 1. Following repeal of the *Threatened Species Conservation Act 1995* on 25 August 2017, “biodiversity credits” created under that Act are taken to be “biodiversity credits” under the *Biodiversity Conservation Act 2016* by virtue of clause 19 of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*.

Table E2: Ecosystem Credits to be Retired

Ecosystem Credits		
<i>Vegetation Zone and Plant Community Type (PCT) ID and Name</i>	<i>EPBC Act equivalent TEC or habitat of EPBC Act listed threatened species</i>	<i>Number of Credits</i>
Zone 1 - PCT27 (BR233, NA219) Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion	<i>Weeping Myall Woodlands</i>	900
Zone 2 - PCT35 (BR120, NA117) Brigalow – Belah open forest / woodland on alluvial often gilgaied clay from Pilliga Scrub to Goondiwindi, Brigalow Belt South Bioregion	<i>Brigalow (Acacia harpophylla dominant and codominant)</i>	1223
Zone 3 - PCT39 (BR130, NA129) Coolabah – River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion	<i>Coolibah - Black Box Woodland of the Darling Riverine Plains and the Brigalow Belt South Bioregions</i>	93
Zone 4 - PCT52 (BR191, NA187) Queensland Bluegrass +/- Mitchell Grass grassland on cracking clay floodplains and alluvial plains mainly the northern-eastern Darling Riverine Plains Bioregion	<i>Natural Grasslands on Basalt and Fine-textured Alluvial Plains of Northern NSW and Southern Qld</i>	20102
Zone 5 - PCT56 (BR186, NA182) Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	Not Listed	8851
Zone 6 - PCT56 (BR186, NA182) Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW (Derived - Native Grasslands)	Not listed	8294
Zone 7 - PCT71 (BR127, NA126) Carbeen – White Cypress Pine - River Red Gum - bloodwood tall woodland on sandy loam alluvial and aeolian soils in the northern Brigalow Belt South Bioregion and Darling Riverine Plains Bioregion	Not listed	23

Zone 8 - PCT 78 River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	Not listed	549
Zone 9 - PCT 135 Coobah - Western Rosewood low open tall shrubland or woodland mainly on outwash areas in the Brigalow Belt South Bioregion	Not listed	354
Zone 10 - PCT 413 Silver-leaved Ironbark - White Cypress Pine - box dry shrub grass woodland of the Pilliga Scrub - Wialda region, Brigalow Belt South Bioregion	Not listed	250
TOTAL ECOSYSTEM CREDITS		40639

Notes:

1. Credits have been calculated using the Framework for Biodiversity Assessment
2. Zone 5 vegetation and parts of Zone 6 vegetation are likely to conform with Poplar Box Grassy Woodland on Alluvial Plains which was listed as a TEC under the EPBC Act in July 2019. As the listing occurred after the controlled action decision was made, ecosystem credits for impacts to the TEC are not required

Table E3: Species Credits to be Retired

Species Credits	
<i>Species</i>	<i>Number of Credits</i>
Koala (<i>Phascolarctos cinereus</i>)	4556
Finger panic grass (<i>Digitaria porrecta</i>)	858 (by no of individuals) 1287 (by habitat area in ha)
Creeping tick-trefoil (<i>Desmodium campylacaulon</i>)	4752
Belsons panic (<i>Homophalis belsonii</i>)	6630 (by individuals) 2600 (by habitat area in ha)
TOTAL SPECIES CREDITS	20683

Note: Credits have been calculated using the Framework for Biodiversity Assessment.

E19 The Proponent may review and update the ecosystem and species credit requirements in **Tables E2** and **E3** to reflect the final construction footprint and resulting extent and type of plant community types to be cleared. Amendments to the ecosystem and species credit requirements must be undertaken in consultation with EES and DAWE and submitted to the Planning Secretary for approval within six (6) months of the commencement of construction or as agreed in writing by the Planning Secretary.

E20 The review and update of credit requirements must be undertaken by:

- (a) using the vegetation mapping and the extent of impact in the revised development footprint (Table 3.4) in the *July 2020 Addendum to the Inland Rail – Narrabri to North Star Biodiversity Assessment Report*; and/or
- (b) completing verification surveys to confirm the extent, type and condition of native vegetation to be impacted.

Where verification surveys are required, they must be undertaken in consultation with EES. Any additional surveys must be undertaken at the time of year when groundcover is most likely to be predominantly native. If evaluation is not possible at a time when groundcover is most likely to be

native, the assumed presence of any relevant species and ecosystems may be applied to conservatively evaluate impacts and associated credit requirements.

- E21 The Proponent must submit to the Planning Secretary for information a copy of the **Credit Retirement Report** for the retirement of the ecosystem and species credits required by **Condition E18** within one month of receiving the report.

Re-use of Timber

- E22 Prior to vegetation clearing, the Proponent must consult with community and landcare groups and government agencies to determine if retained timber and root balls can be reused in habitat enhancement and rehabilitation work, before pursuing other disposal options. The retained timber and root balls may be used on or off the CSSI site.

Koala Habitat

- E23 The Proponent must reduce the area of koala habitat, identified in Table E4, that is impacted by the CSSI by at least 25%, or as otherwise agreed by the Planning Secretary.

Table E4: Vegetation zones/plant community types identified as koala habitat

<i>Vegetation Zone and Plant Community Type (PCT) ID and Name</i>	<i>Total Area impacted (ha)</i>
Zone 2 - PCT35 (BR120, NA117) Brigalow – Belah open forest / woodland on alluvial often gilgaied clay from Pilliga Scrub to Goondiwindi, Brigalow Belt South Bioregion	17.31
Zone 3 - PCT39 (BR130, NA129) Coolabah – River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion	1.74
Zone 4 - PCT52 (BR191, NA187) Queensland Bluegrass +/- Mitchell Grass grassland on cracking clay floodplains and alluvial plains mainly the northern-eastern Darling Riverine Plains Bioregion	0.08 (scattered trees)
Zone 5 - PCT56 (BR186, NA182) Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	143.95
Zone 6 - PCT56 (BR186, NA182) Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW (Derived - Native Grasslands)	0.35 (scattered trees)
Zone 8 - PCT 78 River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	11.82
Total Area Impacted	175.25

- E24 The Proponent must submit a report on the final construction footprint demonstrating how impacts to the plant community types identified in Table E4 have been reduced. This must be provided to the Planning Secretary, EES and DAWE for information, within six (6) months after the commencement of construction or as agreed by the Planning Secretary.
- E25 The Proponent must provide a minimum of 4556 species credits to offset impacts to the koala.

- E26 The offset credits required by **Condition E25** must be sourced where practicable, from:
- (a) The same IBRA subregion as the impacted site, or
 - (b) The adjoining IBRA subregions within the same IBRA region as identified in (a).

Appendix I – Community Views for Draft Notice of Decision

The key issues raised by the community (including in submissions) and considered in the Planning Secretary's Assessment Report include project need; noise and vibration; traffic, transport and access; land use and property and air quality.

Issue	Consideration
<u>Project need</u> <ul style="list-style-type: none"> economic justification for the project. 	<p><i>Assessment</i></p> <ul style="list-style-type: none"> The Department is satisfied that construction of Inland Rail will result in economic benefit for rural and regional areas, creating a catalyst for economic development opportunities in regional NSW. <p><i>Recommended Conditions/Response</i></p> <ul style="list-style-type: none"> No conditions of approval are required in this regard.
<u>Operational noise and vibration</u> <ul style="list-style-type: none"> increase in noise generated from increased frequency and lengths of trains and use of train horns requirement for noise mitigation (such as noise walls) vibration impacts to older dwellings operational noise impacts on Croppa Creek Bowling Club. 	<p><i>Assessment</i></p> <ul style="list-style-type: none"> Increased frequency of trains operating from 2025 will increase noise impacts to receivers adjacent to the rail corridor, however rail noise guidelines provide a framework for mitigation. Measures include various engineering approaches to reduce noise at the source, near the source (noise walls, noise mounds) and at-receiver treatments. The main sources of construction vibration would be excavation, rolling, piling and compaction works. Noise Management Levels are expected to be exceeded, which is reflective of a low background noise level. Operational noise levels at Croppa Creek Bowling Club will not exceed relevant <i>Rail Infrastructure Noise Guidelines</i> mitigation thresholds. Train movements would be infrequent (approximately one every two hours) and are not expected to significantly impact on the amenity of club users. <p><i>Recommended Conditions/Response</i></p> <ul style="list-style-type: none"> An Operational Noise and Vibration Review must be undertaken to monitor effectiveness of mitigation treatments and noise performance and determine whether additional mitigation is required. These treatments will be offered after landowner consultation. Operational noise mitigation measures, such as architectural treatments will be brought forward and implemented during the early stages of construction to assist in addressing construction noise impacts. An Operational Noise Compliance Report (ONCR) must be provided to report on operational stages of the project to verify noise performance and to detail performance of the proposed mitigation measures. Requirements to comply with construction vibration criteria for human comfort and structural integrity; pre-and post-construction dilapidation surveys; and landowner notification before construction that generates vibration commences in the vicinity of properties. Construction noise will be managed through established environmental management measures, including respite

periods, underpinned with comprehensive community consultation.

Traffic, transport and access

- access to private property during construction and from crossing loops
- retention of private level crossings to ensure ongoing daily operations, particularly farming
- traffic and access impacts caused by the construction and operation of the road bridge over Jones Avenue
- suggest consideration of a southern bypass to remove trucks from Moree.

Assessment

- Access to some private properties will be impacted during construction and operation.
- Temporary traffic impacts will occur during construction; however, these impacts will generally be minor in nature.

Recommended Conditions/Response

- Provide affected properties with temporary alternate road and level crossing access as agreed with the landowner and subject to rail safety requirements.
- Evaluate all level crossings affected by the project in consultation with stakeholders to determine whether crossings should be retained, upgraded, consolidated or closed.
- Preparation and implementation of a Transport Network and Connectivity Analysis, that will consider any redistribution of heavy vehicle movements through the residential and commercial areas of Moree.

Landuse and Property

- the project would devalue property.

Assessment

- Amenity impacts will occur during construction and operation of the project, however appropriate mitigation measures will reduce impacts to an acceptable level.
- Impact on property values is not assessed under the *Environmental Planning and Assessment Act 1979*.

Air Quality

- increase in air pollution from operation of the rail line.

Assessment

- The project will have minimal air quality impacts as a result of the increase in number of freight trains traversing the upgraded rail corridor.

Recommended Conditions/Response

- Operational air quality impacts associated with the project will be managed through the Proponent's Environmental Protection Licence.

Appendix J – Independent Hydrology Advice

Appendix K – Recommended Instrument of Approval